MITIGATED NEGATIVE DECLARATION

The County of Santa Clara Roads and Airports Department (County) has reviewed the proposed project described below and determined it would not have a significant effect on the environment. “Significant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, flora, fauna, traffic, and ambient noise.

NAME OF PROJECT: Foothill Expressway Operational Improvements Project

PROJECT LOCATION: The 0.25-mile segment of Foothill Expressway located between San Antonio Road and El Monte Avenue in the City of Los Altos.

PROJECT DESCRIPTION: The County proposes to modify the 0.25-mile segment of Foothill Expressway located between El Monte Avenue and San Antonio Road in the City of Los Altos for the purpose of improving traffic operations. The proposed project was identified in the 2016 voter-approved Measure B, Expressway Program. The primary components of the proposed project include: adding an auxiliary lane in each direction on Foothill Expressway between El Monte Avenue and San Antonio Road; adding a second right turn lane on southbound Foothill Expressway into El Monte Ave; adding a second through lane on westbound El Monte Avenue at the Foothill Expressway/El Monte Avenue intersection; squaring all four corners of the Foothill Expressway/El Monte intersection; adding bike slots on Foothill Expressway; and installing pedestrian sensors at the intersection of Foothill Expressway/El Monte Avenue. All work would be within the existing public streets right-of-way and is anticipated to take approximately six months to complete.

APPLICANT/LEAD AGENCY CONTACT INFORMATION:

Santa Clara County Roads and Airports Department
Attention: Christine Li, Project Manager
101 Skyport Drive / San Jose, California 95110
Email: Christine.Li@rda.sccgov.org

FINDING: The County finds the project described above will not have a significant effect on the environment. The attached Initial Study identifies one or more potentially significant effects on the environment for which mitigation measures are proposed to be implemented to reduce those effects to a less than significant level. The mitigation measures described in the Initial Study and included in the proposed project are listed below.
A. Biological Resources

In compliance with federal and State regulations and protocol, the project proposes to implement the following mitigation measure to reduce impacts to a less than significant level:

- Construction shall be scheduled to avoid the nesting season to the extent feasible. The nesting season for most birds, including most raptors, in the San Francisco Bay area extends from February 1 through August 31.

If it is not possible to schedule construction and tree removal between September 1 and January 31, then pre-construction surveys for nesting birds shall be completed by a qualified ornithologist to ensure no nests are disturbed during project implementation. This survey shall be completed no more than 14 days prior to the initiation of grading, tree removal, or other demolition or construction activities during the early part of the breeding season (February 1 through April 30) and no more than 30 days prior to the initiation of these activities during the late part of the breeding season (May 1 through August 31).

During this survey, the ornithologist shall inspect all trees and other possible nesting habitats within and immediately adjacent to the construction area for nests. If an active nest is found sufficiently close to work areas to be disturbed by construction, the ornithologist, in consultation with CDFW, shall determine the extent of a construction-free buffer zone to be established around the nest to ensure that nests of bird species protected by the MBTA or Fish and Game code shall not be disturbed during project construction.

B. Cultural Resources

The project proposes to implement the following mitigation measures to avoid and/or reduce significant impacts to unknown archaeological resources to a less than significant level:

- Operations shall stop within 50 feet of the find and a qualified professional archaeologist shall be contacted for further review, evaluation, and recommendations consistent with CEQA and County of Santa Clara requirements. Potential recommendations for treatment could include collection, recordation, and analysis of any significant cultural materials followed by a professional report and curation of materials with a responsible facility.

State law shall be followed in regards to the discovery of Native American burials (Chapter 1492, Section 7050.5 to the Health and Safety Code, Sections 5097.94, 5097.98, and 6097.99 of the Public Resources Code). If the remains are Native American, the Santa Clara County Medical Examiner has two working days to examine the remains and must notify the Native American Heritage Commission (NAHC) within 24 hours, if it is determined that the remains are Native American. The NAHC will immediately appoint a Most Likely Descendant (MLD)\(^1\) who has 48 hours to provide recommendations to the land owner for the protection and treatment of the remains. It is not yet known what type of recovery or treatment action might be recommended by the MLD. If the descendent does not make recommendations within 48 hours, the County shall reinter the remains in an area of the property, secure from further disturbance. If the County does not accept the MLD’s recommendations, the County or the MLD may request remediation by the NAHC.

---

\(^1\) California law uses the term “Most Likely Descendent” (MLD); that is, an individual recognized by the NAHC as most likely descended from the deceased Native American. Under California law this individual can recommend appropriate treatment of Native American human remains (e.g., in situ preservation, exhumation, analyses, report, etc.) discovered during construction or other activities.
The project proposes to implement the following mitigation measure reduce impacts to unknown paleontological resources to a less than significant level:

- In the event that a fossil is discovered during construction of the project, excavations within 50 feet of the find shall be temporarily halted or delayed until the discovery is examined by a qualified paleontologist, in accordance with Society of Vertebrate Paleontology standards. The County shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. If the find is determined to be significant and if avoidance is not feasible, the paleontologist shall design and carry out a data recovery plan consistent with the Society of Vertebrate Paleontology standards.

**C. Hazardous Materials**

The following measure would be implemented to reduce and/or avoid significant impacts related to possible soil contamination within the road alignment to a less than significant level:

- As part of project development, a soil investigation will be conducted to determine whether ADL and other toxins of concern have affected soils that will be excavated as part of the proposed project. The testing shall be completed in accordance with a work plan prepared by Santa Clara County Roads and Airports Department Environmental Health and Safety Compliance Specialist. The work plan shall identify the sampling locations and methods and the analytical testing to be completed. The analytical results will be compared against applicable hazardous waste criteria. Based on analytical results, the investigation will provide recommendations regarding management and disposal of affected soils, if present. The recommendations shall be implemented by the project. Examples of such recommendations include, but are not limited to, the preparation and implementation of a Health and Safety Plan to safeguard workers who would handle or be exposed to ADL and other toxins of concerns, BMPs to limit exposure to the public, and/or the transport of contaminated soil to an appropriate facility for disposal.
AERIAL PHOTOGRAPH AND SURROUNDING LAND USES

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SECTION 1.0  INTRODUCTION AND PURPOSE

1.1 PURPOSE OF THE INITIAL STUDY

The Santa Clara County Roads & Airports Department (County) as the owner and operator of Foothill Expressway, has prepared this Initial Study for the Foothill Expressway Operational Improvements in compliance with the California Environmental Quality Act (CEQA), the CEQA Guidelines (California Code of Regulations §15000 et. seq.) and the regulations and policies of the County of Santa Clara, California.

The project proposes to implement improvements to a 0.25-mile segment of Foothill Expressway, between El Monte Avenue and San Antonio Road, in the City of Los Altos. This Initial Study evaluates the environmental impacts that might reasonably be anticipated to result from implementation of the proposed project. Based on the findings in this Initial Study, the proposed project, with implementation of mitigation measures, would not result in significant environmental impacts.

1.2 PUBLIC REVIEW PERIOD

Publication of this Initial Study marks the beginning of a 20-day public review and comment period. During this period, the Initial Study will be available to local, state, and federal agencies and to interested organizations and individuals for review. Written comments concerning the environmental review contained in this Initial Study during the 20-day public review period should be sent to:

Christine Li  
Santa Clara County Roads and Airports Department  
101 Skyport Drive  
San José, CA  95110  
Christine.Li@rda.sccgov.org

Based on the conclusions of the analyses contained in this Initial Study, the County intends to adopt a Mitigated Negative Declaration (MND) under CEQA.

1.3 CONSIDERATION OF THE INITIAL STUDY AND PROJECT

Following the conclusion of the public review period, the Santa Clara County Board of Supervisors, as the decision-making body for the project, will consider the adoption of the MND at a regularly scheduled meeting. The Board of Supervisors shall consider the Initial Study together with any comments received during the public review process. Upon adoption of the MND, the County may proceed with project approval actions.

1.4 NOTICE OF DETERMINATION

If the project is approved, the County will file a Notice of Determination (NOD), which will be available for public inspection and posted within 24 hours of receipt at the County Clerk’s Office for 30 days. The filing of the NOD starts a 30-day statute of limitations on court challenges to the approval under CEQA (CEQA Guidelines Section 15075(g)).
SECTION 2.0    PROJECT INFORMATION

2.1    PROJECT TITLE
Foothill Expressway Operational Improvements

2.2    LEAD AGENCY CONTACT AND PROJECT PROPONENT
Christine Li
Santa Clara County Roads & Airports Department
101 Skyport Drive
San José, CA 95110
(408) 573-2488

2.3    PROJECT LOCATION
The project site is located in the City of Los Altos on a 0.25-mile segment of Foothill Expressway, between El Monte Avenue and San Antonio Road. Foothill Expressway is operated and maintained by the Santa Clara County Roads & Airports Department. The project location is shown on Figure 2.3-1: Regional Map, Figure 2.3-2: Vicinity Map, and Figure 2.3-3: Aerial Photo and Surrounding Uses.

2.4    PROJECT-RELATED APPROVALS, AGREEMENTS, AND PERMITS
The project will require approval from the Santa Clara County Board of Supervisors. Any work within adjacent right-of-way owned by the City of Los Altos will require approvals and/or encroachment permits from the City.
AERIAL PHOTOGRAPH AND SURROUNDING LAND USES

FIGURE 2.3-3
SECTION 3.0 PROJECT DESCRIPTION

The County proposes to implement improvements to a 0.25-mile segment of Foothill Expressway between El Monte Avenue and San Antonio Road in the City of Los Altos for the purpose of improving traffic operations. The proposed improvements was identified in the voter-approved 2016 Measure B, Expressway Program.

The primary components of the proposed project are as follows:

- An auxiliary lane would be constructed in each direction on Foothill Expressway between El Monte Avenue and San Antonio Road. This would involve widening on the west side of Foothill Expressway and reducing the median width to accommodate the auxiliary lanes.
- At the Foothill Expressway/El Monte Avenue intersection, the proposed improvements would include adding a 2\textsuperscript{nd} right turn lane on southbound Foothill Expressway, and a 2\textsuperscript{nd} through lane on westbound El Monte Avenue. In addition, all four corners of the intersection would be squared.
- Bike slots on Foothill Expressway and pedestrian sensors at the intersection of Foothill Expressway/El Monte Avenue would be installed.

Construction of the above-listed improvements would consist of road widening, geometric modification, modification of traffic signals, pavement resurfacing, pavement delineation, and other improvements necessary to implement the project. All work would be within the existing public streets rights-of-way and is anticipated to take approximately six months to complete. Refer to Figure 3.0-1 for the conceptual plan of the proposed improvements.

\footnote{For the purposes of this Initial Study, Foothill Expressway is described as a north/south roadway.}
This section presents the discussion of impacts related to the following environmental subjects in their respective subsections:

4.1 Aesthetics
4.2 Air Quality
4.3 Biological Resources
4.4 Cultural Resources
4.5 Geology and Soils
4.6 Greenhouse Gas Emissions
4.7 Hazards and Hazardous Materials
4.8 Hydrology and Water Quality
4.9 Land Use and Planning
4.10 Noise and Vibration
4.11 Transportation/Traffic
4.12 Mandatory Findings of Significance

The discussion for each environmental subject includes the following subsections:

- **Environmental Checklist** – The environmental checklist, as recommended in the CEQA Guidelines, identifies environmental impacts that could occur if the proposed project is implemented. The right-hand column of the checklist lists the source(s) for the answer to each checklist question. The sources are identified at the end of this section.

- **Impact Discussion** – This subsection discusses the project’s impact as it relates to the environmental checklist questions. For significant impacts, feasible mitigation measures are identified. “Mitigation measures” are measures that will minimize, avoid, or eliminate a significant impact (CEQA Guidelines Section15370). Each impact is numbered using an alphanumeric system that identifies the environmental issue. For example, **Impact HAZ-1** denotes the first potentially significant impact discussed in the Hazards and Hazardous Materials section. Mitigation measures are also numbered to correspond to the impact they address. For example, **MM NOI-2.3** refers to the third mitigation measure for the second impact in the Noise subsection.

### 4.1 RESOURCES NOT AFFECTED BY THE PROJECT

The project proposes operational improvements to an existing 0.25-mile segment of Foothill Expressway, between El Monte Avenue and San Antonio Road, in the City of Los Altos. Compared to existing conditions on Foothill Expressway, the proposed project would not generate new vehicle trips, increase traffic volumes, or otherwise intensify the use of Foothill Expressway and the surrounding roadway system. The project would not extend or increase the capacity of existing utilities, increase demand upon existing utilities or public services, or create new jobs or housing. The proposed improvements would occur within existing, developed public right-of-way. For these reasons, the proposed project would not result in impacts to agricultural and forestry resources, mineral resources, population and housing, public services, recreation, or utilities and service systems, and these resource areas are not discussed further in this Initial Study.
4.2    AESTHETICS

4.2.1    Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Have a substantial adverse effect on a scenic vista?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>b) Substantially damage scenic resources, including, but not limited to, trees, rock outcappings, and historic buildings within a state scenic highway?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>2,4</td>
</tr>
<tr>
<td>c) Substantially degrade the existing visual character or quality of the site and its surroundings?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1,2,3</td>
</tr>
<tr>
<td>d) Create a new source of substantial light or glare which will adversely affect day or nighttime views in the area?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
</tbody>
</table>

4.2.2    Impact Discussion

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

A scenic vista is generally defined as an expanded view of an area that is visually and aesthetically pleasing. The project is not located on a hill or along a ridgeline and is surrounded by existing development. As a result, existing development and trees in the project area would limit views of the proposed improvements to the immediate vicinity. For these reasons, the proposed project would not have a substantial adverse effect on a scenic vista. **(No Impact)**

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

The project is not located within or visible from a designated State Scenic Highway. The nearest officially designated State Scenic Highway is a segment of State Route 9, from Santa Cruz County line to the limits of the Town of Los Gatos, which is located approximately five miles south of the project.2 A segment of Interstate 280, which is located approximately 0.75 miles southwest of the project is eligible, however not officially designated as a State Scenic Highway.3 Therefore, the proposed project would not damage scenic resources within a state scenic highway. **(No Impact)**

---


3 Ibid.
c) Substantially degrade the existing visual character or quality of the site and its surroundings?

The project proposes roadway improvements to Foothill Expressway. In the project area, Foothill Expressway is a four-lane facility (two lanes in each direction) with a raised center median. The project area along the expressway is developed with one- and two-story single-family residences and apartment and office buildings. Soundwalls are located along the west side and fences are located along the east side of Foothill Expressway in the project area. Refer to Photos 1 and 2 for views of the existing roadway segment.

Within the project limits, the trees and shrubs that are planted in the median and along both sides of the expressway within the expressway right-of-way constitute an important component of the existing visual and aesthetic environment. Based on a 2017 tree survey undertaken by an arborist, there are 165 existing trees along the expressway between El Monte Avenue and San Antonio Road. This number is based on a conservative definition of a “tree” as any woody plant having a trunk with a diameter of one inch or greater at a height of 4.5 feet above the ground. The tree protection ordinances of most jurisdiction define a tree using larger diameters. For example, the County’s Tree Preservation Ordinance definition of a tree, which is applicable to this proposed project, is a woody plant having a diameter of 12 inches or greater at a height of 4.5 above the ground. Using the County’s definition, there are 32 trees along Foothill Expressway between El Monte Avenue and San Antonio Road. Further, the County’s Tree Preservation Ordinance defines all trees within the expressway right-of-way as “protected.”

Of the 32 existing protected trees, the project would remove a total of 17 trees. These trees are listed in Table 4.2-1 and their locations are shown on Figure 4.2-1.

<table>
<thead>
<tr>
<th>Tree ID#</th>
<th>Common Name</th>
<th>Diameter (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>109</td>
<td>Sweetgum</td>
<td>20</td>
</tr>
<tr>
<td>110</td>
<td>Sweetgum</td>
<td>18</td>
</tr>
<tr>
<td>111</td>
<td>Sweetgum</td>
<td>15</td>
</tr>
<tr>
<td>112</td>
<td>Sweetgum</td>
<td>14</td>
</tr>
<tr>
<td>114</td>
<td>Sweetgum</td>
<td>14</td>
</tr>
<tr>
<td>115</td>
<td>Sweetgum</td>
<td>13</td>
</tr>
<tr>
<td>116</td>
<td>Sweetgum</td>
<td>15</td>
</tr>
<tr>
<td>126</td>
<td>Sweetgum</td>
<td>15</td>
</tr>
<tr>
<td>127</td>
<td>Sweetgum</td>
<td>16</td>
</tr>
<tr>
<td>128</td>
<td>Sweetgum</td>
<td>14</td>
</tr>
<tr>
<td>130</td>
<td>Sweetgum</td>
<td>15</td>
</tr>
<tr>
<td>132</td>
<td>Monterey Pine</td>
<td>36</td>
</tr>
<tr>
<td>133</td>
<td>Sweetgum</td>
<td>15</td>
</tr>
<tr>
<td>134</td>
<td>Sweetgum</td>
<td>14</td>
</tr>
<tr>
<td>135</td>
<td>Sweetgum</td>
<td>20</td>
</tr>
<tr>
<td>136</td>
<td>Sweetgum</td>
<td>22</td>
</tr>
<tr>
<td>163</td>
<td>Deodar Cedar</td>
<td>13</td>
</tr>
</tbody>
</table>
Consistent with the requirements of the County’s Tree Preservation Ordinance, a minimum of 17 replacement trees would be planted. The project proposes to plant 19 replacement trees, all of which would occur within the project limits along the east side of the existing Foothill Expressway right-of-way and in the median island north of San Antonio Road.

Despite the above-described tree removal, the proposed roadway improvements do not include elevated travel lanes, new sources of light and glare, or other structures that would change the visual character of the project area. Further, most of the existing vegetation would not be impacted, while the 17 trees to be removed would be replaced onsite. Therefore, it is concluded that the proposed project would not substantially degrade the existing visual character or quality of the site and it surroundings. (Less Than Significant Impact)

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

The proposed roadway improvements do not include elevated travel lanes, new sources of light or glare, reflective surfaces or other features that could create substantially light or glare. (No Impact)
Photo 1: View of El Monte Avenue and Foothill Expressway looking west

Photo 2: View of Foothill Expressway looking north
TREE LOCATIONS MAP

<table>
<thead>
<tr>
<th>TREATMENT</th>
<th>EXISTING</th>
<th>TO BE REMOVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>165</td>
<td>55</td>
</tr>
<tr>
<td>≥ 12 INCHES</td>
<td>32</td>
<td>17</td>
</tr>
</tbody>
</table>

**TABLE 4.2-1**

**TREES ≥ 12 INCHES**

**TREES TO BE REMOVED**

**TREES ≥ 12 INCHES TO BE REMOVED**

**SOUTH**

**NORTH**

**WEST**

**EAST**

**FOOTHILL EXPRESSWAY**

**SAN ANTONIO RD**

**FREMONT AVE**

**EL MONTE AVE**

**KEEP EXISTING CURB & GUTTER TO REDUCE CONSTRUCTION COST**

**Figures 4.2-1**

**TREE LOCATIONS MAP**

**FOOTHILL EXPRESSWAY Operational Improvements**

**County of Santa Clara**

**Initial Study**

**September 2018**

**TREE LOCATIONS MAP**

**Figures 4.2-1**

**TREE LOCATIONS MAP**

**Figures 4.2-1**
4.3 AIR QUALITY

4.3.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Conflict with or obstruct implementation of the applicable air quality plan?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
<td>1,5</td>
</tr>
<tr>
<td>b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
<td>1,6</td>
</tr>
<tr>
<td>c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is classified as non-attainment under an applicable federal or state ambient air quality standard including releasing emissions which exceed quantitative thresholds for ozone precursors?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>d) Expose sensitive receptors to substantial pollutant concentrations?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
<td>1,6</td>
</tr>
<tr>
<td>e) Create objectionable odors affecting a substantial number of people?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
<td>1</td>
</tr>
</tbody>
</table>

4.3.2 Impact Discussion

The Bay Area Air Quality Management District (BAAQMD) has adopted thresholds of significance to assist the review of projects under CEQA. These thresholds were designed to establish the level at which BAAQMD reports air pollution emissions would cause significant environmental impacts. The significance thresholds identified by BAAQMD and used in this analysis are summarized in Table 4.3-1.

As discussed in CEQA Guidelines Section 15064(b), the determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the Lead Agency and must be based to the extent possible on scientific and factual data. The County has carefully considered the thresholds updated by BAAQMD in May 2017. The County regards these thresholds to be based on the best information available for the San Francisco Bay Area Air Basin and conservative in terms of the assessment of health effects associated with toxic air contaminants (TACs) and particulate matter (PM). The BAAQMD CEQA thresholds used in this analysis are identified in Table 4.3-1 below.
Table 4.3-1: Thresholds of Significance Used in Air Quality Analyses

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Construction</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average Daily Emissions (pounds)</td>
<td>Average Daily Emissions (pounds)</td>
</tr>
<tr>
<td>Reactive Organic Gases (ROG), Nitrogen Oxides (NOₓ)</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Particulate Matter, 10 microns in size (PM₁₀)</td>
<td>82 (exhaust)</td>
<td>82</td>
</tr>
<tr>
<td>Particulate Matter, 2.5 microns in size (PM₂.₅)</td>
<td>54 (exhaust)</td>
<td>54</td>
</tr>
<tr>
<td>Fugitive Dust (PM₁₀/PM₂.₅)</td>
<td>Implement Best Management Practices</td>
<td>None</td>
</tr>
</tbody>
</table>
| Risk and Hazards for New Sources and Receptors (Project) | Same as operational threshold | • Increased cancer risk of >10.0 in one million  
• Increased non-cancer risk of > 1.0 Hazard Index (chronic or acute)  
• Ambient PM₂.₅ increase: > 0.3 µ/m³  
(Zone of influence: 1,000-foot radius from property line of source or receptor) |
| Risk and Hazards for New Sources and Receptors (Cumulative) | Same as operational threshold | • Increased cancer risk of >100 in one million  
• Increased non-cancer risk of > 10.0 Hazard Index (chronic or acute)  
• Ambient PM₂.₅ increase: > 0.8 µ/m³  
(Zone of influence: 1,000-foot radius from property line of source or receptor) |

Sources: BAAQMD CEQA Thresholds Options and Justification Report (2009) and BAAQMD CEQA Air Quality Guidelines (dated May 2017).

Note: For stationary source projects, modeling for carbon monoxide (CO) concentrations is only required for projects emitting 100 tons per year or more of CO. Projects emitting less are assumed to not exceed the CO concentration threshold.

a) Conflict with or obstruct implementation of the applicable air quality plan?

The air quality plan applicable to the project is the 2017 BAAQMD Clean Air Plan (CAP). The proposed project includes roadway improvements to a 0.25-mile segment of Foothill Expressway that would improve operations and alleviate traffic congestion. Operation of the project would not generate new vehicle trips and associated air pollutant emissions or otherwise result in a significant air quality impact. The proposed project would not conflict with the 2017 CAP because it would have emissions below BAAQMD impact thresholds for new development and serves existing urban
infill development. Because the project would not exceed the BAAQMD impact thresholds, it is not required to incorporate any of the project-specific control measures that are listed in the 2017 CAP. Further, implementation of the project would not inhibit BAAQMD or partner agencies from continuing progress toward attaining state and federal air quality standards and eliminating health-risk disparities from exposure to air pollution among Bay Area communities, as described within the 2017 CAP.

As discussed below, the proposed project would implement the Basic Construction Mitigation Measures Recommended for All Projects identified in the BAAQMD CEQA Air Quality Guidelines and, therefore, would not result in significant construction air quality impacts. For these reasons, the proposed project would not conflict with or obstruct the implementation of the 2017 CAP. (No Impact)

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The proposed project includes roadway improvements to a 0.25-mile segment of Foothill Expressway that would improve operations and alleviate traffic congestion. As noted above, operation of the proposed project would not generate new air pollutant emissions. As discussed below, the proposed project would implement the Basic Construction Mitigation Measures Recommended for All Projects identified in the BAAQMD CEQA Air Quality Guidelines. For these reasons, the proposed project would not violate or contribute to the violation of an existing or projected air quality standard. (Less Than Significant Impact)

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is classified as non-attainment under an applicable federal or state ambient air quality standard including releasing emissions which exceed quantitative thresholds for ozone precursors?

The proposed project includes roadway improvements to a 0.25-mile segment of Foothill Expressway that would improve operations and alleviate traffic congestion. As noted above, operation of the proposed project would not generate new air pollutant emissions and, therefore, would not result in a cumulatively considerable criteria pollutant net increase.

Construction activities, particularly during ground disturbing activities, would temporarily generate fugitive dust in the form of PM$_{10}$ and PM$_{2.5}$. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit dirt or mud on local streets, which could be an additional source of airborne dust. BAAQMD considers these impacts to be less than significant if controlled through implementation of the Basic Construction Mitigation Measures Recommended for All Projects identified in BAAQMD CEQA Air Quality Guidelines.

Standard Measures: The project shall include the following standard BAAQMD construction BMPs to control dust and exhaust during construction:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
• All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
• All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
• All vehicle speeds on unpaved surfaces shall be limited to 15 miles per hour (mph).
• All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible.
• Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California Airborne Toxics Control Measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
• All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
• A publicly-visible sign shall be posted with the telephone number and person to contact at the construction firm regarding dust complaints. This person shall respond and take corrective action within 48 hours. The BAAQMD phone number shall also be visible to ensure compliance with applicable regulations.

The project, with the implementation of the above standard measures, would reduce construction related emissions to a less than significant level by controlling dust and exhaust and limiting exposed soil surfaces.  *(Less Than Significant Impact)*

d)  **Expose sensitive receptors to substantial pollutant concentrations?**

“Sensitive receptors” are groups of people more affected by air pollution than others. The California Air Resources Board (CARB) has identified the following groups of people in this category: children under 14 years of age, people over 65 years of age, athletes, and people with cardiovascular or chronic respiratory diseases. Locations that may contain high concentrations sensitive receptors include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. The nearest sensitive receptors to the proposed project are the residences located east and west of Foothill Expressway.

**Operation**

As noted above, operation of the proposed project would not generate new air pollutant emissions and, therefore, would not expose sensitive receptors in the project area to substantial pollutant concentrations.

**Construction Dust**

Construction activities associated with the proposed project could temporarily expose sensitive receptors fugitive dust in the form of PM\(_{10}\) and PM\(_{2.5}\). As discussed above, however, impacts related to fugitive dust area considered less than significant with implementation of applicable measures from BAAQMD’s *Basic Construction Mitigation Measures Recommended for All Projects*, which are included in the proposed project.
Construction Toxic Air Contaminants – Diesel Particulates

The exhaust from diesel-powered construction equipment contains diesel particulate matter (DPM), a known carcinogen and toxic air contaminant (TAC). Construction of the proposed project is anticipated to take approximately six months to complete, during which time the use of diesel-powered equipment is anticipated. However, given the short duration and relatively low intensity of construction activities associated with the proposed project, construction activities would not expose sensitive receptors in the project area to substantial doses or concentrations of DPM. **(Less Than Significant Impact)**

e) **Create objectionable odors affecting a substantial number of people?**

The proposed project includes roadway improvements to a 0.25-mile segment of Foothill Expressway that would improve operations and alleviate traffic congestion. Operation of the proposed roadway improvements would not generate odors.

Odors from construction equipment (e.g., diesel exhaust) and materials (e.g., asphalt) may be noticeable during construction of the proposed project. Project construction would be temporary; therefore, odors generated during construction activities are not considered significant. **(Less Than Significant Impact)**
### 4.4 BIOLOGICAL RESOURCES

#### 4.4.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>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 Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS)?</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>1</td>
</tr>
<tr>
<td>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 CDFW or USFWS?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1</td>
</tr>
<tr>
<td>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?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>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, impede the use of native wildlife nursery sites?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1,3</td>
</tr>
<tr>
<td>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?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
</tbody>
</table>
4.4.2 Impact Discussion

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 CDFW or USFWS?

The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Avenue. The project area is developed with urban uses and does not support habitat utilized by special-status plant or animal species.

Tree Nesting Birds

Migratory birds and/or raptors are protected under the Migratory Bird Treaty Act (MBTA) and State Fish and Game Codes and may nest in the trees within and adjacent to the proposed roadway improvements. If construction takes place during the breeding season (February 1 through August 31), disturbance could result in the incidental loss of fertile eggs or nestlings, or could otherwise lead to nest abandonment – considered a “take” by the California Department of Fish & Wildlife (CDFW) and, therefore, would constitute a significant impact.

Impact BIO-1: Construction activities and tree removal during the nesting season could result in the loss of fertile eggs, nesting raptors or other migratory birds, or nest abandonment.

Mitigation Measure: In compliance with federal and State regulations and protocol, the project proposes to implement the following mitigation measure to reduce impacts to a less than significant level.

MM BIO-1: Construction shall be scheduled to avoid the nesting season to the extent feasible. The nesting season for most birds, including most raptors, in the San Francisco Bay area extends from February 1 through August 31.

If it is not possible to schedule construction and tree removal between September 1 and January 31, then pre-construction surveys for nesting birds shall be completed by a qualified ornithologist to ensure no nests are disturbed during project implementation. This survey shall be completed no more than 14 days prior to the initiation of grading, tree removal, or other demolition or construction activities during the early part of the breeding season (February 1 through April 30) and no more than 30 days prior to the initiation of these activities during the late part of the breeding season (May 1 through August 31).

During this survey, the ornithologist shall inspect all trees and other possible nesting habitats within and immediately adjacent to the construction area for nests. If an active nest is found sufficiently close to work areas to be disturbed by construction, the ornithologist, in consultation with CDFW, shall determine the extent of a construction-free buffer zone to be established around the nest to ensure that nests of bird species protected by the MBTA or Fish and Game code shall not be disturbed during project construction.
The project, with implementation of the above mitigation measure, would reduce impacts to nesting birds (if present) by avoiding construction during nesting bird season or completing pre-construction nesting bird surveys to minimize and/or avoid impacts to nesting birds. **(Less Than Significant Impact with Mitigation Incorporated)**

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 CDFW or USFWS?**

The proposed roadway improvements are located in the City of Los Altos in an area developed with urban uses that does not support sensitive habitat. The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Avenue. There are no waterways or riparian habitat located within or adjacent to the areas of the proposed roadway improvements. The nearest waterway is Adobe Creek, which is located approximately 0.25 miles west of the proposed project. For these reasons, the proposed project would not have a substantial adverse effect on riparian habitat or other sensitive natural community. **(No Impact)**

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?**

The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Avenue. There are no water bodies or wetlands located on or adjacent to the proposed project; therefore, the implementation of the project would not have a substantial adverse effect on wetlands. **(No Impact)**

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, impede the use of native wildlife nursery sites?**

The setting of the proposed project is an existing expressway located in an area developed with urban uses. The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Road. There are no waterways located within or adjacent to the proposed project. For these reasons, the project area does not function as a wildlife corridor or wildlife nursery site, and the project would not substantially interfere with the movement of fish or wildlife or impede the use of wildlife nursery sites. **(No Impact)**

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

The project is subject to the requirements of the Santa Clara County Tree Protection and Preservation Ordinance. A number of trees, as defined under the ordinance, will be removed by the project and will be replaced per the requirements of the ordinance. As discussed in **Section 4.2 Aesthetics** for a detailed discussion of this subject. Based on that discussion, the project would not conflict with the Santa Clara County Tree Protection and Preservation Ordinance. **(No Impact)**
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?

The proposed project is not located within the boundaries of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan and, therefore, would not conflict with such plans. (No Impact)
4.5 CULTURAL RESOURCES

The following discussion is based, in part, on an archaeological resource assessment prepared by Basin Research Associates in February 2017. The archaeological resource assessment may discuss locations of specific archaeological sites and, therefore, is confidential. For this reason, it is not included in this Initial Study. Qualified personnel, however, may request a copy of the report from the Santa Clara County Roads & Airports Department during normal business hours.

4.5.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Cause a substantial adverse change in the significance of an historical resource as defined in CEQA Guidelines Section 15064.5?</td>
<td>[ ]</td>
<td>[ ]</td>
<td>□</td>
<td>□</td>
<td>1,20</td>
</tr>
<tr>
<td>b) Cause a substantial adverse change in the significance of an archaeological resource as defined in CEQA Guidelines Section 15064.5?</td>
<td>[ ]</td>
<td>[ ]</td>
<td>□</td>
<td>□</td>
<td>1,20</td>
</tr>
<tr>
<td>c) Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature?</td>
<td>[ ]</td>
<td>[ ]</td>
<td>□</td>
<td>□</td>
<td>1,20</td>
</tr>
<tr>
<td>d) Disturb any human remains, including those interred outside of dedicated cemeteries?</td>
<td>[ ]</td>
<td>[ ]</td>
<td>□</td>
<td>□</td>
<td>1,20</td>
</tr>
<tr>
<td>e) 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:</td>
<td>[ ]</td>
<td>[ ]</td>
<td>□</td>
<td>□</td>
<td>1,20</td>
</tr>
<tr>
<td>1. 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</td>
<td>[ ]</td>
<td>[ ]</td>
<td>□</td>
<td>□</td>
<td>1,20</td>
</tr>
</tbody>
</table>
Would the project:

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Less Than Significant Impact</th>
<th>Less Than Significant Impact With Mitigation Incorporated</th>
<th>No Impact</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying this criteria, the significance of the resource to a California Native American tribe shall be considered.</td>
<td>❑</td>
<td>❑</td>
<td>❑</td>
<td>1,20</td>
</tr>
</tbody>
</table>

4.5.2 **Impact Discussion**

a) **Cause a substantial adverse change in the significance of an historical resource?**

The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Road. No structures would be removed or physically affected as a result of the proposed project. There are no known historic resources or heritage trees located within or adjacent to the area of the proposed project. The nearest known historic resource is the Orange University Historic District, which is located approximately 0.3 miles southeast of the proposed roadway improvements. For these reasons, the proposed project would not impact historic resources. **(No Impact)**

b,d) **Cause a substantial adverse change in the significance of an archaeological resource? Disturb any human remains, including those interred outside of dedicated cemeteries?**

The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Road in areas that have been repeatedly disturbed over the past 60 years during construction and maintenance of the existing expressway and related improvements including subsurface infrastructure. As a result, most project-related construction activities would occur within areas of non-native fill and/or previously disturbed areas. Based on the results of the Archaeological Resource Assessment completed for the project, there are no known archaeological resources located within or adjacent to the proposed project. For these reasons, the potential for intact archaeological resources to be present in the areas of the proposed roadway improvements is low.

There is always the possibility, however, that archaeological resources (including human remains) could be uncovered during excavation. The disturbance of these resources, if they are encountered during construction activities, could result in an impact.

**Impact CUL-1:** Although unlikely, unknown cultural resources could be encountered during excavation activities associated with the proposed project.

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4 City of Los Altos. *Historic Resources Inventory*. October 2012.
Mitigation Measures: The project proposes to implement the following mitigation measures to avoid and/or reduce significant impacts to unknown archaeological resources to a less than significant level:

MM CUL-1.1: Operations shall stop within 50 feet of the find and a qualified professional archaeologist shall be contacted for further review, evaluation, and recommendations consistent with CEQA and County of Santa Clara requirements. Potential recommendations for treatment could include collection, recordation, and analysis of any significant cultural materials followed by a professional report and curation of materials with a responsible facility.

MM CUL-1.2: State law shall be followed in regards to the discovery of Native American burials (Chapter 1492, Section 7050.5 to the Health and Safety Code, Sections 5097.94, 5097.98, and 6097.99 of the Public Resources Code). If the remains are Native American, the Santa Clara County Medical Examiner has two working days to examine the remains and must notify the Native American Heritage Commission (NAHC) within 24 hours, if it is determined that the remains are Native American. The NAHC will immediately appoint a Most Likely Descendant (MLD) who has 48 hours to provide recommendations to the land owner for the protection and treatment of the remains. It is not yet known what type of recovery or treatment action might be recommended by the MLD. If the descendent does not make recommendations within 48 hours, the County shall reinter the remains in an area of the property, secure from further disturbance. If the County does not accept the MLD’s recommendations, the County or the MLD may request remediation by the NAHC.

(Less Than Significant Impact with Mitigation Incorporated)

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

Paleontological resources are the fossilized remains of organisms from prehistoric environments found in geologic strata. There are no known unique paleontological resources or sites, or unique geologic features present within or adjacent to the area of the proposed roadway improvements. Soils onsite consist of alluvial fans, which are relatively young soil, consisting of gravel, sand, and finer sediments. In addition, most project-related construction activities would occur within areas of non-native fill and/or previously disturbed areas. Therefore, the potential for intact paleontological resources to be present in the areas of the proposed roadway improvements is low.

5 California law uses the term “Most Likely Descendent” (MLD); that is, an individual recognized by the NAHC as most likely descended from the deceased Native American. Under California law this individual can recommend appropriate treatment of Native American human remains (e.g., in situ preservation, exhumation, analyses, report, etc.) discovered during construction or other activities.
However, the possibility of paleontological resources being uncovered during project construction cannot be entirely dismissed. The disturbance of these resources, if they are encountered during construction activities, could result in an impact.

**Impact CUL-2:** Although unlikely, unknown paleontological resources could be uncovered during excavation activities associated with the proposed roadway improvements.

**Mitigation Measures:** The project proposes to implement the following mitigation measure reduce impacts to unknown paleontological resources to a less than significant level:

**MM CUL-2:** In the event that a fossil is discovered during construction of the project, excavations within 50 feet of the find shall be temporarily halted or delayed until the discovery is examined by a qualified paleontologist, in accordance with Society of Vertebrate Paleontology standards. The County shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. If the find is determined to be significant and if avoidance is not feasible, the paleontologist shall design and carry out a data recovery plan consistent with the Society of Vertebrate Paleontology standards.

(Less Than Significant Impact with Mitigation Incorporated)

e) **Cause a substantial adverse change in the significance of a tribal cultural resource that is:** 1) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources, 2) determined to be a significant resource to a California Native American tribe.

As a part of the archaeological resource assessment, the NAHC was contacted for review of the Sacred Lands Files. The results of the Sacred Lands Files review was negative. Furthermore, no known Native American villages, post-contact settlements, trails, traditional or contemporary use areas have been identified within or adjacent to the area of the proposed roadway improvements. For these reasons, the proposed project would not impact tribal cultural resources. (No Impact)

4.5.3 **Conclusion**

With the implementation of identified mitigation measures, the project would result in less than significant cultural resources impacts. (Less Than Significant Impact with Mitigation Incorporated)
4.6 GEOLOGY AND SOILS

4.6.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Rupture of a known earthquake fault, as described 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)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,21,22</td>
</tr>
<tr>
<td>2. Strong seismic ground shaking?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,21,11</td>
</tr>
<tr>
<td>3. Seismic-related ground failure, including liquefaction?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,21,22</td>
</tr>
<tr>
<td>4. Landslides?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,21,22</td>
</tr>
<tr>
<td>b) Result in substantial soil erosion or the loss of topsoil?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1,2,3</td>
</tr>
<tr>
<td>c) Be located on a geologic unit or soil that is unstable, or that will become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1,21</td>
</tr>
<tr>
<td>d) Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2016), creating substantial risks to life or property?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1,23</td>
</tr>
<tr>
<td>e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1</td>
</tr>
</tbody>
</table>

On December 17, 2015, the California Supreme Court issued an opinion in “CBIA vs. BAAQMD” holding that CEQA is primarily concerned with the impacts of project on the environment and generally does not require agencies to analyze the impact of existing conditions on a project unless the project could exacerbate the existing environmental hazards or risks. Except for the potential for project construction activities to exacerbate soil erosion, the proposed project would not exacerbate existing geology and soil conditions in the project area. The discussion below of existing geological conditions in the project area affecting the project is for information only.
4.6.2 Impact Discussion

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: 1) rupture of a known earthquake fault, 2) strong seismic ground shaking, 3) seismic-related ground failure, or 4) landslides?

The project area is relatively flat with no existing slope instability or landslide-related hazard. The project area is located in a seismically-active region and as such, would likely be subject to strong to very strong earthquake-induced ground shaking during the lifetime of the proposed project. While there are no known active faults in the project area, ground shaking from regional fault rupture could damage the proposed project. The proposed roadway improvements would not, however, exacerbate the rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides. As such, there would be no CEQA impact. (No Impact)

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

The immediate and surrounding project area is relatively flat and there are no existing slope instability, erosion, or landslide related hazards. The proposed improvements to Foothill Expressway would require additional paving within the project limits, which would not lead to increased erosion over the long-term. Project construction activities, however, would temporarily expose soil to the erosive forces of wind and water. Any erosion or loss of topsoil associated with this temporary condition will be mitigated by the inclusion of water quality measures, as listed in Section 4.9 Hydrology and Water Quality, measures are included in the proposed project to reduce erosion and associated impacts to water quality to a less than significant level. (Less Than Significant Impact)

c) Be located on a geologic unit or soil that is unstable, or that will become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

The immediate and surrounding project area is relatively flat, and there is no existing slope instability, erosion, or landslide related hazards. The project area is not mapped within a liquefaction zone. The roadway improvements would not, therefore, exacerbate on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. (No Impact)

d) Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2007), creating substantial risks to life or property?

Soils at the project site have moderate to high expansion potential. Damage to the proposed roadway improvements would be avoided using standard engineering design techniques that address expansive soils. The roadway improvements would not, therefore, exacerbate the hazards of the existing on-site expansive soils. As such, there would be no CEQA impact. (No Impact)

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e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The project is limited to improvements to an existing roadway and will not generate waste. As such, septic tanks or alternative wastewater disposal systems are not proposed by the project. Therefore, this threshold is not applicable. **(No Impact)**

4.6.3 **Conclusion**

The project would not result in significant geology and soils impacts. **(Less Than Significant Impact)**
4.7 GREENHOUSE GAS EMISSIONS

4.7.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?</td>
</tr>
<tr>
<td>b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact</th>
<th>Less Than Significant With Mitigation</th>
<th>Less Than Significant</th>
<th>No Impact</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1,6,9</td>
</tr>
</tbody>
</table>

Greenhouse gas (GHG) emissions worldwide contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single land use project could generate sufficient GHG emissions on its own to noticeably change the global average temperature. The combination of greenhouse gas emissions from past, present, and future projects in the County, the entire State of California, and across the nation and around the world, contribute cumulatively to global climate change and its associated environmental impacts.

The following discussion focuses on whether project emissions represent a cumulatively considerable contribution to climate change as determined by consistency with the County, City of Los Altos, and Statewide efforts to curb GHG emissions.

**BAAQMD Threshold of Significance**

The County and other jurisdictions in the San Francisco Bay Area Air Basin have used the thresholds and methodology for assessing air emissions and/or health effects in the BAAQMD CEQA Air Quality Guidelines (May 2011), which are based upon scientific and factual data prepared by BAAQMD in developing the thresholds.

The County considers the BAAQMD thresholds to be based on the best information available for the San Francisco Bay Area Air Basin. Under the BAAQMD CEQA Air Quality Guidelines, if a project will result in operational-related GHG emissions of 1,100 metric tons (MT) (also referred to as the “brightline” threshold) or 4.6 MT per service population\(^{10}\) of carbon dioxide equivalents (CO\(_2\)e)\(^{11}\) or

---

\(^{10}\) Service population is defined as the sum of the number of residents and the number of employees at the development.

\(^{11}\) CO\(_2\)e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, one ton of methane (CH\(_4\)) has the same contribution to the greenhouse effect as approximately 23 tons of CO\(_2\). Therefore, CH\(_4\) is a much more potent GHG than CO\(_2\). Expressing emissions in CO\(_2\)e takes the contributions of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO\(_2\) were being emitted. Source: BAAQMD. *CEQA Air Quality Guidelines*. 2012.
more per year, the project would make a cumulatively considerable contribution to GHG emissions and result in a significant impact to global climate change.\textsuperscript{12}

The bright-line numeric threshold of 1,100 MT CO\textsubscript{2}e/year is a numeric emissions level, below which a project’s contribution to global climate change would be less than cumulatively considerable. For projects that are above this bright-line cutoff level, emissions from these projects would still be less than cumulatively significant if the annual GHG emissions from the project, as a whole, are less than or equal to 4.6 MT CO\textsubscript{2}e per service population. Such a result would indicate that GHG emissions rates are below year 2020 targets contained in Assembly Bill 32, the California Global Warming Solutions Act, which became law in 2006.

4.7.2 Impact Discussion

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

Construction GHG Emissions

GHG emissions during construction of the proposed roadway improvements would be the result of processing and manufacturing construction supplies, operating construction equipment, and construction-related vehicle trips (construction crews, material and equipment deliveries, off hauling demolition debris and soil, etc.). GHG emissions will be generated at different levels throughout project construction activities. Construction-related GHG emissions vary depending on the level of activity, duration of the construction, specific construction operations, equipment-type use, and number of construction personnel. Currently, neither the County, City of Los Altos, nor BAAQMD have adopted GHG significance thresholds that apply to construction projects. Given the small size of the proposed project and given that the project is located in an urban setting near construction supplies, equipment, and workforces, GHG emissions resulting from project-related construction activities would not contribute substantially to local or regional GHG emissions. For these reasons and because construction GHG emissions would be a temporary condition and would not result in permanent ongoing emissions that would interfere with the implementing AB 32, GHG emissions during construction of the proposed project would be less than significant. (Less Than Significant Impact)

Operational GHG Emissions

The proposed roadway improvements would not generate new vehicles trips. The proposed project would reduce vehicle delays on this segment of Foothill Expressway and its intersections with El Monte Avenue and San Antonio Road, which is one of its objectives. Improving an existing direct travel route through the City of Los Altos would reduce vehicle hours traveled (VHT). These improvements would, in turn, result in a positive effect on GHG emissions. For these reasons, the proposed roadway improvements would not generate operational GHG emissions that would exceed the BAAQMD significance threshold. (Less Than Significant Impact)

\textsuperscript{12} One metric ton = approximately 2,205 pounds.
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The proposed roadway improvements would not generate new vehicle trips and would reduce vehicle delays. The proposed operational improvements to an existing direct travel route would not increase daily VMT, and could serve to reduce VMT and associated GHG emissions. As described above, the construction phase of the project would not generate substantial GHGs and the operational phase would result in a reduction in GHG emissions. GHG emissions would be below BAAQMD GHG thresholds.

These results are consistent with the goals and objectives of plans and policies that are designed to reduce GHG emissions. For these reasons, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Less Than Significant Impact)
### 4.8 HAZARDS AND HAZARDOUS MATERIALS

#### 4.8.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>1</td>
</tr>
<tr>
<td>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?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>1</td>
</tr>
<tr>
<td>c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>1</td>
</tr>
<tr>
<td>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, will it create a significant hazard to the public or the environment?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>10</td>
</tr>
<tr>
<td>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, will the project result in a safety hazard for people residing or working in the project area?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>1,11</td>
</tr>
<tr>
<td>f) For a project within the vicinity of a private airstrip, will the project result in a safety hazard for people residing or working in the project area?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>1</td>
</tr>
<tr>
<td>g) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>1</td>
</tr>
<tr>
<td>h) 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?</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>12</td>
</tr>
</tbody>
</table>
4.8.2 Impact Discussion

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

Unlike an industrial use, the proposed operational improvements to Foothill Expressway would not involve the manufacture, use, or disposal of hazardous materials. The expressway would, however, be used by a variety of trucks carrying such materials, as has been the case historically and as continues today. There are no known existing conditions along the project alignment that restrict or preclude trucks and that will not change if the improvements are constructed. Therefore, the degree to which the transport of such materials will continue in the future will be unaffected by the project. It is worth noting that all vehicles operating on public roads are subject to local, state, and federal regulations governing the transport of hazardous materials, including the Hazardous Materials Transportation Act. For these reasons, the proposed project would not result in significant hazard to the public or the environment. (No Impact)

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?

Until the early 1990s, lead was commonly added to gasoline. As a result, lead was emitted as a component of motor vehicle exhaust. Upon being emitted from the exhaust pipes of vehicles, the airborne lead would tend to settle in the soils along roadways. As a result, soil sampling along many roadways has found that concentrations of lead exceed applicable thresholds for classification as a hazardous material. This phenomenon, known as aerially-deposited lead (ADL), is widespread. Because Foothill Expressway was built prior to the phaseout of lead as a gasoline additive, elevated concentrations of lead are likely to be present in the soil along the expressway.

Impact HAZ-1: Grading and excavation activities associated with the proposed roadway improvements could expose construction workers and nearby sensitive receptors to ADL. (Significant Impact)

The following measure would be implemented to reduce and/or avoid significant impacts related to possible soil contamination within the road alignment to a less than significant level.

MM HAZ-1: As part of project development, a soil investigation will be conducted to determine whether ADL and other toxins of concern have affected soils that will be excavated as part of the proposed project. The testing shall be completed in accordance with a workplan prepared by Santa Clara County Roads and Airports Department Environmental Health and Safety Compliance Specialist. The work plan shall identify the sampling locations and methods and the analytical testing to be completed. The analytical results will be compared against applicable hazardous waste criteria. Based on

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13 Lead is a heavy metal that is found in many products. Lead is poisonous to humans. It is especially toxic to the nervous system, although it can adversely effect many systems and organs. Starting in the 1970s, lead has been removed from certain products such as paint and gasoline in order to reduce the potential for chronic exposure.
analytical results, the investigation will provide recommendations regarding management and disposal of affected soils, if present. The recommendations shall be implemented by the project. Examples of such recommendations include, but are not limited to, the preparation and implementation of a Health and Safety Plan to safeguard workers who would handle or be exposed to ADL and other toxins of concerns, BMPs to limit exposure to the public, and/or the transport of contaminated soil to an appropriate facility for disposal.

With implementation of the mitigation measure identified above, the potential for the proposed road alignment to expose construction workers and nearby sensitive receptors to ADL would be reduced to a less than significant level. (Less Than Significant Impact With Mitigation Incorporated)

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The southern boundary of the project at the intersection of Foothill Expressway and El Monte Avenue is approximately 0.15 miles south of Covington Elementary School and two preschools. As discussed in Section 4.3 Air Quality, the project would temporarily generate air pollutants in the form of TACs and fugitive dust during the construction period. Implementation of the Basic Construction Mitigation Measures Recommended for All Projects identified in the BAAQMD CEQA Air Quality Guidelines would reduce air pollutant emissions to a less than significant level.

As discussed above, shallow surface soil within the alignment could contain elevated levels of ADL. Disturbance of these soils during construction could cause lad to become airborne. The proposed project, however, includes MM HAZ-1 to avoid potential ADL impacts to sensitive receptors. Implementation of these mitigation measures would also reduce hazardous materials impacts to nearby schools to a less than significant level. (Less Than Significant Impact with Mitigation Incorporated)

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, will it create a significant hazard to the public or the environment?

Section 65962.5 of the Government Code requires the California Environmental Protection Agency (CalEPA) to develop and update (at least annually) a list of hazardous waste and substances sites. This list is used by the State, local agencies, and developers to comply with CEQA requirements. The list includes hazardous substance release sites identified by the Department of Toxic Substances Control (DTSC) and the State Water Resources Control Board (SWRCB).

Based on a search of the State regulatory databases (i.e., Geotracker databases managed by SWRCB, a list of solid waste disposal sites identified by SWRCB, a list of “active” Cease and Desist Orders and cleanup and Abatement Orders managed by the SWRCB, Envirostor managed by DTSC, and a list of hazardous waste facilities subject to corrective action identified by DTSC), the project site is not listed on the hazardous waste or substances sites updated annually per Section 65962.5 of the
Government Code.\textsuperscript{14} The proposed project, therefore, would not result in impacts related to hazardous materials sites compiled pursuant to Government Code Section 65962.5.  \textbf{(No Impact)}

e) \textbf{Result in a nearby airport-related safety hazard for people residing or working in the project area?}

The proposed project is not located in proximity to an airport. The nearest airport is the Moffett Federal Airfield, located approximately 4.5 miles northeast of the project site. Palo Alto Airport, a general aviation facility, is located approximately 5.8 miles north of the site. Norman Y. Mineta San José International Airport is located approximately 10 miles east of the project site. The project site is not located within the Airport Influence Area (AIA) of any of these airports, which is a composite of the areas surrounding an airport that are affected by noise, height, and safety considerations.\textsuperscript{15} For these reasons, implementation of the proposed project would not result in safety hazard impacts due to airport activities.  \textbf{(No Impact)}

f) \textbf{Result in a private airstrip-related safety hazard for people residing or working in the project area?}

The project area is not located near a private airstrip and, therefore, would not result in related impacts. \textbf{(No Impact)}

g) \textbf{Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?}

The proposed project would improve traffic operations and relieve congestion on a 0.25-segment of Foothill Expressway, thereby improving emergency vehicle response times within the project area. Therefore, the proposed project would not impair or interfere with the implementation of any emergency response or evacuation plan.  \textbf{(No Impact)}

h) \textbf{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?}

The proposed roadway improvements are located within a developed urban area that is not designated a wildfire hazard zone.\textsuperscript{16} \textbf{(No Impact)}

\textbf{4.8.3 Conclusion}

The proposed project, with implementation of mitigation measure MM HAZ-1, would not result in significant hazards or hazardous materials impacts. \textbf{(Less Than Significant Impact with Mitigation Incorporated)}

\textsuperscript{14} CalEPA. “Cortese List Data Resources.” Accessed May 7, 2019. Available at: \url{https://calepa.ca.gov/sitecleanup/corteselist/}.

\textsuperscript{15} Sources: 1) Santa Clara County Airport Land Use Commission, \textit{Moffett Federal Airfield Comprehensive Land Use Plan}. November 2, 2012. Figure 3-17.  2) Santa Clara County Airport Land Use Commission. \textit{Palo Alto Airport Comprehensive Land Use Plan}. Figure 3-15.  3) Santa Clara County Airport Land Use Commission. \textit{Norman Y. Mineta San José International Airport Comprehensive Land Use Plan}. November 2016.

### 4.9 HYDROLOGY AND WATER QUALITY

#### 4.9.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Violate any water quality standards or waste discharge requirements?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells will drop to a level which will not support existing land uses or planned uses for which permits have been granted)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on-or off-site?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which will result in flooding on-or off-site?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,13</td>
</tr>
<tr>
<td>e) Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>1</td>
</tr>
<tr>
<td>f) Otherwise substantially degrade water quality?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,14</td>
</tr>
<tr>
<td>h) Place within a 100-year flood hazard area structures which will impede or redirect flood flows?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,14</td>
</tr>
<tr>
<td>i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,15</td>
</tr>
<tr>
<td>j) Inundation by seiche, tsunami, or mudflow?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
</tbody>
</table>
4.9.2 Impact Discussion

a) Violate any water quality standards or waste discharge requirements?

The proposed roadway improvements would not generate wastewater or otherwise result in waste discharge impacts. (No Impact)

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells will drop to a level which will not support existing land uses or planned uses for which permits have been granted)?

There are no groundwater recharge facilities (sometimes referred to as “percolation ponds”) located within the project footprint.

The proposed roadway improvements would not utilize or otherwise deplete groundwater supplies. As discussed under checklist question e), the proposed project would incrementally increase impervious surfaces. The incremental increase in impervious surfaces resulting from the project would not substantially interfere with groundwater recharge. (Less Than Significant Impact)

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on-or off-site?

The project area is relatively flat. The proposed project would not include the construction of new buildings or structures and therefore would not alter existing drainage patterns in the project area. Runoff from the proposed roadway improvements would continue to enter to existing stormwater drainage system serving the project area as it does under existing conditions. The proposed roadway improvements would occur within the existing developed right-of-way, and are not located within an area subject to the hydromodification management requirements.17

As noted previously, there are no creeks or waterways located within or adjacent to the project footprint.

For all of these reasons, the project would not alter the existing drainage pattern of the area and would not result in substantial on- or off-site erosion or siltation. (No Impact)

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which will result in flooding on-or off-site?

The proposed roadway improvements would not alter existing drainage patterns in the project area. Runoff from the proposed roadway improvements would continue to enter to existing stormwater

drainage system serving the project area. As discussed under checklist question e), runoff generated by the proposed project would be treated onsite prior to discharging to the existing stormwater drainage system, reducing both the rate and volume of stormwater runoff. For these reasons, the proposed project would not result in flooding on or off the site. (No Impact)

e) **Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?**

**Construction**

Construction of the proposed roadway improvements would result in temporary impacts to surface water quality by generating dust, litter, oil, and other pollutants that could contaminate runoff from the site. Construction activities would also result in the disturbance of underlying soils, thereby increasing the potential for erosion and sedimentation.

The proposed project would disturb more than one acre of soil and, therefore, would be subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Per the requirements of the NPDES Construction General Permit (CGP), the project would implement the standard measures listed below to reduce impacts to water quality from construction activities.

**Standard Measures:** The following standard measures would be implemented in conformance with federal and State requirements:

- The County will prepare and file Notice of Intent with the San Francisco Bay Regional Water Quality Control Board and a Storm Water Pollution Prevention Program (SWPPP) will be prepared. The certified SWPPP shall be posted along the project alignment and will be updated as necessary to reflect current site conditions and shall include the following:

  - BMPs, as specified in the California Storm Water Best Management Practice Handbook, shall be implemented (such as silt fences/straw waddles around the perimeter of the site, regular street cleaning, temporary cover of disturbed surfaces, and inlet protection) to reduce water quality impacts from construction activities.

  - Erosion- and dust-control measures shall be implemented during construction and all adjacent streets shall be kept free of dirt and mud during construction. All vegetation in disturbed areas will be replanted as quickly as possible, and all trucks hauling soil or other loose materials will be covered and/or at least two feet of freeboard shall be maintained.

**Post-Construction**

The 0.25-mile segment of Foothill Expressway to be improved by the proposed project currently contains 262,700 square feet of impervious surfaces. The proposed roadway improvements would increase impervious surfaces within the project alignment by approximately 22,770 square feet (approximately 8.6 percent increase) to a total of 285,470 square feet of impervious surfaces, incrementally increasing the amount of stormwater runoff generated. The project would add or replace more than 10,000 square feet of impervious surfaces and, therefore, would be required to
comply with NPDES Municipal Regional Permit (MRP), which provides enhanced performance standards for the management of stormwater of new development. In conformance with the MRP, the project would implement the standard measures listed below.

**Standard Measures:** The following standard measures would be implemented in conformance with federal and State requirements:

- During the final design of the project, the County will develop details of specific BMPs, including, but not limited to, bioswales and landscaping to provide filtering and reduce impervious surface area.

- All post-construction Treatment Control Measures (TCMs) will be hydraulically sized to treat all runoff from the roadway, in accordance with County of Santa Clara numeric sizing criteria for pollutant removal treatment systems.

- All TCMs will be installed, operated, and maintained by qualified personnel. On-site inlets will be stenciled in conformance with County requirements and cleaned out a minimum of once per year, prior to the wet season.

The proposed project, with implementation of the standard measures listed above and in compliance with the NPDES CGP and MRP, would not violate water quality standards or waste discharge requirements, create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff. *(Less Than Significant Impact)*

**f) Otherwise substantially degrade water quality?**

As discussed under checklist question e), construction and operation of the proposed roadway improvements with implementation of standard measures and in compliance with the NPDES CGP and MRP, would not violate water quality standards or waste discharge requirements, create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff. Therefore, the proposed project would not otherwise substantially degrade water quality. *(No Impact)*

**g) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?**

The proposed project does not propose housing and, therefore, would not place housing within a 100-year flood hazard area. *(No Impact)*

**h) Place within a 100-year flood hazard area structures which will impede or redirect flood flows?**
Based on floodplain maps prepared by the Federal Emergency Management Agency (FEMA), the project site is not located within a 100-year flood hazard area. Therefore, the proposed project would impede or redirect flows within 100-year flood hazard area.  

(No Impact)

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

The proposed roadway improvements are not located within a dam failure inundation area, or area subject to flooding due to levee failure. Therefore, the proposed project would not expose people or structures to flooding as a result of the failure of a levee or dam. (No Impact)

j) Result in inundation by seiche, tsunami, or mudflow?

The project site is not located near a lake or other body of water that is subject to a seiche. The project site is not subject to inundation from a tsunami. The project site is relatively flat and is not subject to mudflows. Therefore, the proposed project would not be affected by these hazards. (No Impact)

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## 4.10 LAND USE AND PLANNING

### 4.10.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Physically divide an established community?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
<tr>
<td>b) 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?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1,16</td>
</tr>
<tr>
<td>c) Conflict with any applicable habitat conservation plan or natural community conservation plan?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☒</td>
<td>1</td>
</tr>
</tbody>
</table>

### 4.10.2 Impact Discussion

**a) Physically divide an established community?**

The proposed project includes roadway improvements to a 0.25-mile segment of Foothill Expressway located in the City of Los Altos. The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Road. The proposed project would not create a physical barrier that would divide an established community. **(No Impact)**

**b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?**

The proposed project is identified in the voter-approved 2016 Measure B, Expressway Program. The roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Road and, therefore, would not conflict with existing or future land use. For these reasons, the project would not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. **(No Impact)**

**c) Conflict with any applicable habitat conservation plan or natural community conservation plan?**

The proposed roadway improvements would occur within the existing developed right-of-way of Foothill Expressway and El Monte Road. The project is not located within boundaries of a habitat or...
natural community conservation plans. The proposed project would not conflict with an applicable habitat or natural community conservation plan. (No Impact)
4.11 NOISE AND VIBRATION

The following discussion is based, in part, on an Environmental Noise Assessment prepared by Illingworth & Rodkin, Inc. in April 2018. A copy of this report is included in Appendix A of this Initial Study.

4.11.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project result in:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?</td>
<td></td>
<td></td>
<td>☒</td>
<td>☒</td>
<td>1,17,18,19</td>
</tr>
<tr>
<td>b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?</td>
<td></td>
<td></td>
<td>☒</td>
<td>☒</td>
<td>1,17</td>
</tr>
<tr>
<td>c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?</td>
<td></td>
<td></td>
<td>☒</td>
<td>☒</td>
<td>1,9,17,18,19</td>
</tr>
<tr>
<td>d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?</td>
<td></td>
<td></td>
<td>☒</td>
<td>☒</td>
<td>1,17,18,19</td>
</tr>
<tr>
<td>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, will the project expose people residing or working in the project area to excessive noise levels?</td>
<td></td>
<td></td>
<td>☒</td>
<td>☒</td>
<td>1,11</td>
</tr>
<tr>
<td>f) For a project within the vicinity of a private airstrip, will the project expose people residing or working in the project area to excessive noise levels?</td>
<td></td>
<td></td>
<td>☒</td>
<td>☒</td>
<td>1</td>
</tr>
</tbody>
</table>

CEQA does not define what noise level increase would be considered substantial. The following criteria, based on standards identified in the County’s General Plan and the City of Los Altos General Plan and Municipal Code20, were used to evaluate the significance of environmental noise resulting from the project:

---

20 There are various descriptors of noise used in these general plans. $\text{Leq}$ stands for the Noise Equivalent Level and is a measurement of the average energy level intensity of noise over a given period of time such as the peak commute hour. $\text{Ldn}$ stands for Day-Night Level and is a 24-hour average of noise levels, with a 10-dB penalty applied to noise occurring between 10 PM and 7 AM. $\text{CNEL}$ stands for Community Noise Equivalent Level; it is similar to the $\text{Ldn}$ except that there is an additional 5-dB penalty applied to noise that occurs between 7 PM and 10 PM.
• A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the General Plans or Municipal Code; or

• A significant impact would be identified if the construction of the project would expose persons to excessive vibration levels. Ground-borne vibration levels exceeding 0.3 inches per second (in/sec) Peak Particle Velocity (PPV) would have the potential to result in cosmetic damage to normal buildings; or

• A significant impact would be identified if traffic generated by the project or project improvements/operations would: a) result in an increase of three dBA community noise equivalent level (CNEL) or greater at noise-sensitive land uses where existing or project noise levels would exceed the noise level considered satisfactory for the affected land use, or b) an increase of five dBA CNEL or greater at noise-sensitive land uses where noise levels would continue to be below those considered satisfactory for the affected land use; or

• A significant noise impact would be identified if construction activities are predicted to occur more than one year at noise-sensitive receiver locations and exceed 60 dBA $L_{eq}$ and ambient noise levels by five dBA $L_{eq}$ or more.

County of Santa Clara General Plan

The County of Santa Clara’s General Plan sets forth noise and land use compatibility standards for proposed land uses in the Health and Safety section. The County establishes 55 dBA $L_{dn}$ as the noise level limit that is compatible with residential and 60 dBA $L_{dn}$ for educational land uses. The County also establishes 65 dBA $L_{dn}$ as the noise level limit that is compatible with recreational and 70 dBA $L_{dn}$ for commercial land uses. General Plan Policy C-HS(i) states that construction shall be prohibited in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented.

City of Los Altos General Plan

The City of Los Altos General Plan sets forth noise and land use compatibility standards for proposed land uses. General Plan Policy 7.2 establishes 60 dBA CNEL as the maximum acceptable outdoor noise exposure level for single-family residential areas and 65 dBA CNEL or less as the maximum acceptable outdoor noise exposure level for multi-family residential areas. General Plan Policy 7.4 requires a project to consider the potential impact on the general noise level when planning changes and improvements to the circulation system.

City of Los Altos Municipal Code

The City’s Municipal Code regulates the noise levels of any fixed sources of disturbing, excessive or offensive sounds or noises on adjacent noise sensitive land uses. Section 6.16.070 of the Municipal Code limits the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work adjacent to residential properties to between the hours of 7:00 AM and 5:30 PM on weekdays and between 9 AM and 3 PM on Saturdays, with no noise generating construction allowed on Sundays or the City-observed holidays of New Year’s Day, Memorial Day, Independence Day, Labor Day, Veteran’s Day, Thanksgiving Day and Christmas Day. Where technically and
economically feasible, construction activities, including mobile and stationary equipment, shall be limited to a maximum of 75 dBA in residential districts all other times and days.

4.11.2 Impact Discussion

a) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

Construction of the proposed project would generate noise level exceeding the City’s 75 dBA $L_{\text{max}}$ criteria where nearby residential receptors are not shielded by existing noise barriers. As discussed above, a construction noise impact would be significant if noise level standards are exceeded more than one year. Since construction is anticipated to take approximately six months and noise levels at individual receptors would decrease as construction activities progress along the alignment, the project would not result in significant construction impacts. Further, project construction activities would be limited to the hours specified in the City of Los Altos Municipal Code and the standard noise construction noise avoidance measures listed below would be implemented by the project.

Standard Measures: The project shall implement the following standard construction noise reduction measures:

- Limit noise-producing signals, including horns, whistles, alarms, and bells, to safety warning purposes only;
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for equipment;
- Unnecessary idling of internal combustion engines should be strictly prohibited;
- Locate stationary noise-generating equipment, such as air compressors or portable power generators, away from sensitive receptors;
- If stationary-noise generating equipment must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) shall be used to reduce noise levels at adjacent sensitive receptors;
- Utilize “quiet” air compressors and other stationary noise sources where technology exists;
- Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and adjacent noise-sensitive receptors;
- Control noise from construction worker radios to a point where they are not audible at adjacent residences;
- Designate a “disturbance coordinator” who would be responsible for responding to construction noise complaints. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem;
- Post the telephone number for the disturbance coordinator at conspicuous locations on the construction site and include the telephone notice sent to neighbors regarding the construction schedule.
Based on the applicable noise thresholds, project-generated construction noise would not be significant. In addition, limiting construction hours as specified in the Municipal Code and implementing the standard measures described above would further reduce construction-related noise impacts. **(Less Than Significant Impact)**

**Operation**

The proposed roadway improvements include adding one auxiliary lane to Foothill Expressway in each direction between San Antonio Road and El Monte Avenue, a second right-turn lane on southbound Foothill Expressway, and a second through lane on westbound El Monte Avenue. The project would also square the northeast, northwest, and southwest corner of the El Monte Avenue intersection and add pedestrian sensors at the intersection. There is an existing nine foot tall noise barrier on the west side of Foothill Expressway.

Noise measurements were taken along the alignment to determine ambient noise levels. The primary noise source at all measured locations was traffic utilizing Foothill Expressway. Based on the noise measurements, ambient noise levels along the project alignment range from 56 to 69 CNEL.

According to the City’s General Plan, a significant impact would occur if the permanent noise level increase due to project-generated noise was three dBA CNEL or greater at noise-sensitive land uses where existing or project noise levels exceed 60 dBA CNEL. Based on estimated future traffic volumes, the noise level increase attributable to the proposed roadway improvements is calculated to be approximately one dBA CNEL. The noise level increase would be less than the City’s three dBA CNEL threshold. **(Less Than Significant Impact)**

**b) Result in exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels?**

Vibration generated from vehicle traffic along the proposed roadway improvements is anticipated to be below 0.01 in/sec PPV, which is below the threshold of 0.3 in/sec PPV at nearby structures. Project construction, which is anticipated to take approximately six months, may generate perceptible vibration during heavy equipment or impact tool (e.g., jackhammers, hoe rams, etc.) use. At a distance of 20 feet, however, vibration levels from the various types of equipment anticipated to be used during construction of the proposed roadway improvements would be below the 0.3 in/sec PPV threshold. In addition, vibration levels at individual receptors would decrease as construction activities progress along the alignment and project construction activities would be limited to the hours specified in the City of Los Altos Municipal Code. For these reasons, vibration levels during construction of the proposed roadway improvements would not result in a significant impact. **(Less Than Significant Impact)**

**c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?**

Based on noise measurements taken along Foothill Expressway in the project area, ambient noise levels along the project alignment range from 56 to 69 CNEL. Based on estimated future traffic volumes, the noise level increase attributable to the proposed roadway improvements is calculated to be approximately one dBA CNEL. This noise level increase would be less than the threshold of
three dBA CNEL and, therefore, is not considered a substantial permanent noise increase. **(Less Than Significant Impact)**

d) **Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project**

The improvements would generate noise exceeding the City’s 75 dBA $L_{max}$ criteria where nearby residential receptors are not shielded by existing noise barriers. As discussed above under checklist question a), construction of the proposed roadway improvements is estimated to take less than one year (approximately six months) to complete, and construction noise levels at individual receptors would decrease as construction progresses along the roadway alignment. With implementation of the standard measures listed under checklist question a), the project would not result in a substantial temporary increase in ambient noise levels in the project vicinity. **(Less Than Significant Impact)**

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 expose people residing or working in the project area to excessive noise levels?**

As discussed in *Section 4.8 Hazards and Hazardous Materials*, the proposed project is not located within an airport land use plan or within two miles of an airport. **(No Impact)**

f) **For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?**

As discussed in *Section 4.8 Hazards and Hazardous Materials*, the proposed project is not located in the vicinity of a private airstrip. **(No Impact)**
4.12 TRANSPORTATION/TRAFFIC

The following discussion is based on an Operational Analysis prepared by Iteris, Inc. in August 2018. A copy of this report is included in Appendix B of this Initial Study.

4.12.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Would the project:</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>1,9,16</td>
</tr>
<tr>
<td>b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>1,9,16</td>
</tr>
<tr>
<td>c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>1,11</td>
</tr>
<tr>
<td>d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible land uses (e.g., farm equipment)?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>1,9,16</td>
</tr>
<tr>
<td>e) Result in inadequate emergency access?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>1,9,16</td>
</tr>
<tr>
<td>f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>1,9,16</td>
</tr>
</tbody>
</table>
4.12.2 Impact Discussion

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

The proposed project, which is identified in the voter-approved 2016 Measure B, Expressway Program, proposes improvements to a 0.25-mile segment of Foothill Expressway between El Monte Avenue and San Antonio Road in the City of Los Altos. As stated previously, the objective of the project is to improve pedestrian, bicycle, and traffic operations. The proposed improvements include the following:

- Adding an auxiliary lane in each direction on Foothill Expressway between El Monte Avenue and San Antonio Road.
- Adding a 2nd right turn lane on southbound Foothill Expressway at the Foothill Expressway/El Monte Avenue intersection.
- Adding a 2nd through lane on westbound El Monte Avenue.
- Squaring all corners of the intersection.

Similar to existing conditions, the project would include bike slots and pedestrian sensors at the intersection of Foothill Expressway/El Monte Avenue.

Traffic Operations Impact Methodology

Local street performance is measured using the “level of service” (LOS) concept, whereby traffic demand is evaluated in the context of capacity. Since intersections are a key factor in determining the capacity of local streets, local plans focus on AM and PM peak-hour operations at intersections. The methodology, which is based on the Transportation Research Board’s Highway Capacity Manual, computes a LOS taking into account factors such as the demand for each traffic movement (i.e., left turns, straight, right turns), the number of lanes, and (where applicable) signal timing. Based on these factors, the methodology computes the average delay per vehicle at the intersection using software known as TRAFFIX, to which a corresponding LOS is assigned.

LOS can range from “LOS A”, representing free-flow conditions, to “LOS F”, representing jammed/over-saturated conditions. The City of Los Altos and the County of Santa Clara have established peak-hour LOS goals of D and E, respectively

Traffic Operations Impact

As shown in Table 4.12-1, Foothill Expressway and El Monte Avenue intersection operations would improve under the proposed project. The average delay per vehicle would decrease and intersection LOS would improve from LOS E+ to LOS D- during the AM peak-hour and from LOS E- to LOS E during the PM peak-hour.

As shown in Table 4.12-2, Foothill Expressway and San Antonio Road intersection operations would improve under the proposed project. The average delay per vehicle would decrease and intersection
LOS would improve from LOS E- to LOS E during the PM peak-hour. The change during the AM peak-hour would be negligible.

By adding features such as crosswalks and sensors, as well as squaring the intersections (which reduce vehicular speeds for turning traffic, enhance pedestrian visibility, and reduce intersection crossing distance), the proposed project would improve pedestrian, bicycle, and traffic operations in the project area. (No Impact)

Table 4.12-1: Foothill Expressway/El Monte Avenue Intersection Operations

<table>
<thead>
<tr>
<th>Peak Hour</th>
<th>Scenario</th>
<th>Average Delay Per Vehicle</th>
<th>Level of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>Existing</td>
<td>57.2</td>
<td>E+</td>
</tr>
<tr>
<td></td>
<td>Existing + Project</td>
<td>53.4</td>
<td>D-</td>
</tr>
<tr>
<td>PM</td>
<td>Existing</td>
<td>79.2</td>
<td>E-</td>
</tr>
<tr>
<td></td>
<td>Existing + Project</td>
<td>63.4</td>
<td>E</td>
</tr>
</tbody>
</table>


Table 4.12-2: Foothill Expressway/San Antonio Road Intersection Operations

<table>
<thead>
<tr>
<th>Peak Hour</th>
<th>Scenario</th>
<th>Average Delay Per Vehicle</th>
<th>Level of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM</td>
<td>Existing</td>
<td>9.5</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>Existing + Project</td>
<td>9.4</td>
<td>A</td>
</tr>
<tr>
<td>PM</td>
<td>Existing</td>
<td>78.7</td>
<td>E-</td>
</tr>
<tr>
<td></td>
<td>Existing + Project</td>
<td>71.8</td>
<td>E</td>
</tr>
</tbody>
</table>

b) **Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?**

The Santa Clara Valley Transportation Agency oversees the Congestion Management Program (CMP) for Santa Clara County. As discussed above under checklist question a), the proposed project would improve pedestrian, bicycle, and traffic operations in the project area, which is consistent with the goals and objectives of the CMP. *(No Impact)*

c) **Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?**

The proposed project would improve the operation of the existing roadway, and would not change or interfere with air traffic patterns. *(No Impact)*

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

All roadway improvements under the jurisdiction of the County, including the proposed project, are required to adhere to its applicable roadway design standards and regulations, the primary purpose of which is ensuring safe travel for all modes of transportation. For these reasons, the proposed project would not increase hazards. *(No Impact)*

e) **Result in inadequate emergency access?**

The proposed roadway improvements would alleviate congestion and improve the operation of a 0.25-mile segment of Foothill Expressway, which would improve emergency response times in the project area. *(No Impact)*

f) **Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?**

As discussed above under checklist questions a) and d), the proposed project would improve pedestrian, bicycle, and traffic operations and safety along a 0.25-mile segment of Foothill Expressway. Therefore, the project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. *(No Impact)*
4.13 MANDATORY FINDINGS OF SIGNIFICANCE

4.13.1 Environmental Checklist

<table>
<thead>
<tr>
<th>Environmental Question</th>
<th>Potentially Significant Impact</th>
<th>Less Than Significant With Mitigation Incorporated</th>
<th>Less Than Significant Impact</th>
<th>No Impact</th>
<th>Checklist Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Does the project have the potential to degrade the quality of the environment,</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>1-19</td>
</tr>
<tr>
<td>substantially reduce the habitat of a fish or wildlife species, cause a fish or</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>wildlife population to drop below self-sustaining levels, threaten to eliminate a</td>
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</tr>
<tr>
<td>plant or animal community, reduce the number or restrict the range of a rare or</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>endangered plant or animal or eliminate important examples of the major periods of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>California history or prehistory?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Does the project have impacts that are individually limited, but cumulatively</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>1-19</td>
</tr>
<tr>
<td>considerable (“cumulatively considerable” means that the incremental effects of a</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>project are considerable when viewed in connection with the effects of past projects,</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>the effects of other current projects, and the effects of probable future projects)?</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Does the project have environmental effects which will cause substantial adverse</td>
<td>☐</td>
<td>☒</td>
<td>☐</td>
<td>☐</td>
<td>1-19</td>
</tr>
<tr>
<td>effects on human beings, either directly or indirectly?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.13.2 Impact Discussion

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?

The project would result in temporary impacts to air quality, water quality, and noise   |
during construction. Implementation of standard measures identified in the respective   |
sections of this Initial Study, would reduce these temporary construction-related impacts |
to a less than significant level.

Project construction, including tree removal, has the potential to impact nests, eggs,   |
or protected bird species. Implementation of mitigation measure MM BIO-1 would avoid     |
impacts to nesting migratory birds and raptors, and trees removed would be replaced     |
consistent with the County’s Tree Preservation Ordinance.
Although unlikely, project construction activities also have the potential to impact unrecorded archaeological and paleontological resources. Implementation of mitigation measures MM CUL-1 and MM CUL-2 would reduce these impacts to a less than significant level.

The proposed project, with implementation of standard measures and mitigation measures, would not result in significant biological or cultural resource impacts. (Less Than Significant with Mitigation Incorporated)

b) Does the project have impacts that are individually limited, but cumulatively considerable?

The potential environmental impacts from the proposed roadway improvement project are primarily limited to the construction period. Construction of the proposed project is estimated to take up to six months. Standard measures and mitigation measures are included in the proposed project to reduce impacts to air quality, biology, cultural resources, hydrology and water quality, and hazardous materials impacts during project construction to a less than significant level. Therefore, the proposed project would not contribute to cumulative impacts upon these resources. (Less Than Significant with Mitigation Incorporated)

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

The proposed project would improve pedestrian, bicycle, and traffic operations and safety along a congested segment of Foothill Expressway. In addition, with implementation of standard measures and mitigation measures included in the proposed project and described in air quality, biological resources, cultural resources, hydrology and water quality, and hazardous materials sections of this Initial Study, the proposed roadway improvement would not cause significant adverse effects on human beings, either directly or indirectly.
Checklist Sources

1. Professional Judgement and expertise of the environmental specialist preparing this assessment, based upon a review of the site and surrounding conditions, as well as a review of the project plans.
11. 1) Santa Clara County Airport Land Use Commission, Moffett *Federal Airfield Comprehensive Land Use Plan*. November 2, 2012. Figure 3-17. 2) Santa Clara County Airport Land Use Commission. *Palo Alto Airport Comprehensive Land Use Plan*. Figure 3-15. 3) Santa Clara County Airport Land Use Commission. *Norman Y. Mineta San José International Airport Comprehensive Land Use Plan*. November 2016.


CalEPA. “Cortese List Data Resources.” Accessed May 7, 2019. Available at: https://calepa.ca.gov/sitecleanup/corteselist/.


City of Los Altos. *Historic Resources Inventory.* October 2012.


Santa Clara County Airport Land Use Commission, Moffett Federal Airfield Comprehensive Land Use Plan. November 2, 2012. Figure 3-17.


Santa Clara County Airport Land Use Commission. Palo Alto Airport Comprehensive Land Use Plan. Figure 3-15

Santa Clara County Roads & Airports Department. San Tomas Expressway Widening Project Initial Study/Mitigated Negative Declaration. April 2014


SECTION 6.0 LEAD AGENCY AND CONSULTANTS

6.1 LEAD AGENCY
Santa Clara County Roads and Airports Department
   Harry Freitas, Director
   Christine Li, Project Manager

6.2 CONSULTANTS
   Environmental Consultants and Planners
      John Hesler, Principal Project Manager
      Demetri Loukas, Principal Project Manager
      Amy Wang, Assistant Project Manager

Mott McDonald
   Engineering Services
      Teferi Abere

Basin Research Associates
   Cultural Resource Services
      Colin I. Busby

Illingworth & Rodkin, Inc.
   Acoustical Consultant
      Manasi Biwalkar

Iteris, Inc.
   Traffic Consultants
Appendix A: Noise Assessment
ENVIRONMENTAL NOISE ASSESSMENT
for
FOOTHILL EXPRESSWAY OPERATIONAL
IMPROVEMENTS PROJECT
LOS ALTOS, CALIFORNIA

April 4, 2018

♦ ♦ ♦ ♦

Prepared for:
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1871 The Alameda, Suite 200
San Jose, CA 95126

Prepared by:
Manasi Biwalkar
Dana M. Lodico, P.E., INCE Bd. Cert.

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Petaluma, CA 94952
(707) 766-7700

Job No.: 17-181
INTRODUCTION

This report presents the results of an environmental noise assessment conducted for the Foothill Expressway Operational Improvement Project in Los Altos, California. As described in detail, below, the project would construct auxiliary lanes and intersection improvements along a 0.25-mile segment of Foothill Expressway from El Monte Avenue to San Antonio Road in the City of Los Altos. Existing sound walls along the expressway will remain undisturbed. The site is adjoined by residential and commercial uses.

This report evaluates the project’s potential to result in significant impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines. The report is divided into two sections: 1) the Setting Section provides a brief description of the fundamentals of environmental noise, summarizes applicable regulatory criteria, and discusses the results of the ambient noise monitoring survey completed to document existing noise condition and 2) the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts, provides a discussion of each project impact, and presents mitigation measures, where necessary, to provide a compatible project in relation to adjacent noise sources and land uses.

PROJECT DESCRIPTION

The Santa Clara County Roads & Airports Department (County) is proposing to implement improvements to a 0.25-mile segment of Foothill Expressway between El Monte Avenue and San Antonio Road in Los Altos for the purpose of improving traffic operations. The proposed improvements have been identified as a Tier 1 (priority) project in the Santa Clara County Expressway Plan 2040.

The primary components of the proposed project are as follows:

- An auxiliary lane will be constructed in each direction on Foothill Expressway between El Monte Avenue and San Antonio Road. This will involve widening on the west side of Foothill Expressway and reducing the median width to accommodate the auxiliary lanes.
- At the Foothill Expressway/El Monte Avenue intersection, the proposed improvements include adding a 2nd right turn lane on southbound Foothill Expressway, and a 2nd through lane on westbound El Monte Avenue. The northeast, northwest, and southwest corners of the intersection will be squared.

The project would include bike slots on Foothill Expressway and pedestrian sensors at the intersection of Foothill Expressway/El Monte Avenue. Work will consist of road widening, geometric modification, modification of traffic signals, pavement resurfacing, pavement delineation, and other improvements necessary to implement the project. All work would be within the existing public streets rights-of-way.
Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA)*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called $L_{eq}$. The most common averaging period is hourly, but $L_{eq}$ can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level (CNEL)* is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level (DNL or $L_{dn}$)* is essentially the same.
as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

**Effects of Noise**

*Sleep and Speech Interference*

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA L_{dn} with open windows and 65-70 dBA L_{dn} if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.
**Annoyance**

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The $L_{dn}$ as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA $L_{dn}$. At a $L_{dn}$ of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the $L_{dn}$ increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a $L_{dn}$ of 60-70 dBA. Between a $L_{dn}$ of 70-80 dBA, each decibel increase increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the $L_{dn}$ is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.

**Fundamentals of Groundborne Vibration**

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous vibration levels produce.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess
groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decibel, dB</td>
<td>A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.</td>
</tr>
<tr>
<td>Sound Pressure Level</td>
<td>Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.</td>
</tr>
<tr>
<td>Frequency, Hz</td>
<td>The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.</td>
</tr>
<tr>
<td>A-Weighted Sound Level, dBA</td>
<td>The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.</td>
</tr>
<tr>
<td>Equivalent Noise Level, L_{eq}</td>
<td>The average A-weighted noise level during the measurement period.</td>
</tr>
<tr>
<td>L_{max}, L_{min}</td>
<td>The maximum and minimum A-weighted noise level during the measurement period.</td>
</tr>
<tr>
<td>L_{01}, L_{10}, L_{50}, L_{90}</td>
<td>The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.</td>
</tr>
<tr>
<td>Day/Night Noise Level, L_{dn} or DNL</td>
<td>The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.</td>
</tr>
<tr>
<td>Community Noise Equivalent Level, CNEL</td>
<td>The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.</td>
</tr>
<tr>
<td>Ambient Noise Level</td>
<td>The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.</td>
</tr>
<tr>
<td>Intrusive</td>
<td>That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common Outdoor Activities</th>
<th>Noise Level (dBA)</th>
<th>Common Indoor Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet fly-over at 1,000 feet</td>
<td>110 dBA</td>
<td>Rock band</td>
</tr>
<tr>
<td>Gas lawn mower at 3 feet</td>
<td>100 dBA</td>
<td></td>
</tr>
<tr>
<td>Diesel truck at 50 feet at 50 mph</td>
<td>90 dBA</td>
<td>Food blender at 3 feet</td>
</tr>
<tr>
<td>Noisy urban area, daytime</td>
<td>80 dBA</td>
<td>Garbage disposal at 3 feet</td>
</tr>
<tr>
<td>Gas lawn mower, 100 feet</td>
<td>70 dBA</td>
<td>Vacuum cleaner at 10 feet</td>
</tr>
<tr>
<td>Commercial area</td>
<td></td>
<td>Normal speech at 3 feet</td>
</tr>
<tr>
<td>Heavy traffic at 300 feet</td>
<td>60 dBA</td>
<td>Large business office</td>
</tr>
<tr>
<td>Quiet urban daytime</td>
<td>50 dBA</td>
<td>Dishwasher in next room</td>
</tr>
<tr>
<td>Quiet urban nighttime</td>
<td>40 dBA</td>
<td>Theater, large conference room</td>
</tr>
<tr>
<td>Quiet suburban nighttime</td>
<td>30 dBA</td>
<td>Library</td>
</tr>
<tr>
<td>Quiet rural nighttime</td>
<td>20 dBA</td>
<td>Bedroom at night, concert hall</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(background)</td>
</tr>
<tr>
<td></td>
<td>10 dBA</td>
<td>Broadcast/recording studio</td>
</tr>
<tr>
<td></td>
<td>0 dBA</td>
<td></td>
</tr>
</tbody>
</table>

Source: Technical Noise Supplement (TeNS), California Department of Transportation, November 2009.
<table>
<thead>
<tr>
<th>Velocity Level, PPV (in/sec)</th>
<th>Human Reaction</th>
<th>Effect on Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>Barely perceptible</td>
<td>No effect</td>
</tr>
<tr>
<td>0.04</td>
<td>Distinctly perceptible</td>
<td>Vibration unlikely to cause damage of any type to any structure</td>
</tr>
<tr>
<td>0.08</td>
<td>Distinctly perceptible to strongly perceptible</td>
<td>Recommended upper level of the vibration to which ruins and ancient monuments should be subjected</td>
</tr>
<tr>
<td>0.1</td>
<td>Strongly perceptible</td>
<td>Virtually no risk of damage to normal buildings</td>
</tr>
<tr>
<td>0.3</td>
<td>Strongly perceptible to severe</td>
<td>Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings</td>
</tr>
<tr>
<td>0.5</td>
<td>Severe - Vibrations considered unpleasant</td>
<td>Threshold at which there is a risk of damage to newer residential structures</td>
</tr>
</tbody>
</table>

Regulatory Background

The State of California and the City of Los Altos have established regulatory criteria that are applicable in this assessment. The State’s CEQA guidelines, Appendix G, are used to assess the potential significance of environmental noise impacts pursuant to local policies set forth in the City of Los Altos General Plan and Municipal Code.

**State CEQA Guidelines.** The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of environmental noise impacts attributable to a proposed project. Applicable CEQA checklist questions\(^1\) ask whether the project would result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies?

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

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 expose people residing or working in the project area to excessive noise levels?

f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

CEQA does not define the noise level increase that is considered substantial. Typically, a permanent increase in the day-night average noise level of 3 dBA CNEL or greater at noise-sensitive receptors would be considered significant when projected noise levels would exceed those considered satisfactory for the affected land use. An increase of 5 dBA CNEL or greater would be considered significant when projected noise levels would continue to meet those considered satisfactory for the affected land use. A substantial temporary noise increase from construction is typically defined as noise levels exceeding 60 dBA L\(_{eq}\) and the ambient noise environment by at least 5 dBA L\(_{eq}\) for a period of more than one year at noise sensitive land uses.

**City of Los Altos General Plan.** The City of Los Altos’ General Plan sets forth noise and land use compatibility standards for proposed land uses (General Plan, Table NEH-1: Land Use Compatibility Standards). Policy 7.2 establishes 60 dBA CNEL as the maximum acceptable

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\(^1\) CEQA checklist questions e and f, regarding potential impacts from aircraft noise, are not applicable in the assessment and have been omitted. These items are not discussed further.
outdoor noise exposure level for single-family residential areas and 65 dBA CNEL or less as the maximum acceptable outdoor noise exposure level for multi-family residential areas. The following policies would be applicable to the project:

Policy 7.4: Consider the potential impact on the general noise level when planning changes and improvements to the circulation system.

Policy 7.5: Require reasonable mitigation measures to reduce noise levels to those determined to be acceptable in the event that significant increase in noise levels will result from an improvement to the circulation system.

Policy 7.9: Minimize stationary noise sources and noise emanating from construction activities.


The City limits the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work adjacent to residential properties to between the hours of 7:00 a.m. and 5:30 p.m. on weekdays and between 9:00 a.m. and 3:00 p.m. on Saturdays, with no noise generating construction allowed on Sundays or the city observed holidays of New Year’s Day, Memorial Day, Independence Day, Labor Day, Veteran’s Day, Thanksgiving Day and Christmas Day. This section applies to operations on residentially zoned property only.

Where technically and economically feasible, construction activities, including mobile and stationary equipment, shall be limited to 75 dBA $L_{max}$ in residential districts between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and Saturdays and to 50 dBA $L_{max}$ in residential districts at all other times and days.

Existing Noise Environment

The project proposes construct improvements on Foothill Expressway between El Monte Avenue and San Antonio Road in the City of Los Altos. Existing land uses adjoining Foothill Expressway are primarily residential, with some commercial uses located just north of the intersection of Foothill Expressway and San Antonio Road.

A noise monitoring survey was conducted from October 3rd through 5th, 2017 to document existing noise conditions along the project corridor. The noise monitoring survey included two long-term (48-hour) measurements and five short-term noise measurements (10-minute). Noise measurement locations are shown on Figure 1. Short-term measurement locations ST-1, ST-3, and ST-5 were shielded from Foothill Expressway by sound walls and separated from Foothill Expressway by local roadways such as Lincoln Avenue along the southbound side and Fremont Avenue along northbound side of Foothill Expressway. The primary noise source at noise
sensitive locations adjacent to the project alignment is traffic noise from vehicles traveling on Foothill Expressway. Traffic volumes on local roadways were low and did not contribute significantly to the noise environment at any of the measurement locations during the noise monitoring survey.

Traffic noise levels along Foothill Expressway were monitored over a 48-hour period at locations LT-1 and LT-2. Site LT-1 was located on Fremont Avenue, about 80 feet north of Foothill Expressway. Hourly average noise levels at LT-1 ranged from 62 to 70 dBA $L_{eq(\text{hr})}$ during daytime hours and were as low as 51 dBA $L_{eq(\text{hr})}$ during the 2:00 a.m. hour. The community noise equivalent level at LT-1 was calculated to be 69 dBA CNEL. Site LT-2 was located about 80 feet south of Foothill Expressway, in front of 666 Lincoln Avenue, and shielded by an existing 9-foot high noise barrier. Hourly average noise levels at LT-2 ranged from 56 to 63 dBA $L_{eq(\text{hr})}$ during daytime hours and were as low as 45 dBA $L_{eq(\text{hr})}$ during the 2:00 a.m. hour. The community noise equivalent level at LT-2 was calculated to be 63 dBA CNEL. The daily trend in noise levels over the noise-monitoring periods for LT-1 and LT-2 are shown in Figures 2 through 7.

Short-term noise measurements (two 10-minute periods) were made at five locations within the project study limits to complete the noise monitoring survey. Table 4 summarizes the results of these measurements. The primary noise source at all of these locations was traffic noise from vehicles traveling on Foothill Expressway. Locations ST-1, ST-3, and ST-5 were shielded by an existing 9-foot high noise barrier.
Figure 1: Noise Measurement and Existing Noise Barrier Locations
Table 4: Summary of Short-Term Noise Measurement Data, October 5th, 2017

<table>
<thead>
<tr>
<th>ID</th>
<th>Location (Start Time)</th>
<th>Measured Noise Levels, dBA</th>
<th>Calculated CNEL, dBA</th>
<th>Acoustical Shielding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$L_{10}$</td>
<td>$L_{50}$</td>
<td>$L_{90}$</td>
</tr>
<tr>
<td>ST-1</td>
<td>Back of 789 Orange Avenue (12:00 p.m./12:10 p.m.)</td>
<td>60</td>
<td>56</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
<td>55</td>
<td>51</td>
</tr>
<tr>
<td>ST-2</td>
<td>Side of 139 Fremont Avenue (12:50 p.m./1:00 p.m.)</td>
<td>63</td>
<td>58</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>64</td>
<td>58</td>
<td>54</td>
</tr>
<tr>
<td>ST-3</td>
<td>Front of 620 Lincoln Avenue (12:00 p.m./12:10 p.m.)</td>
<td>61</td>
<td>57</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>61</td>
<td>57</td>
<td>51</td>
</tr>
<tr>
<td>ST-4</td>
<td>Back of 550 Tyndall Street (12:50 p.m./1:00 p.m.)</td>
<td>69</td>
<td>63</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>68</td>
<td>63</td>
<td>57</td>
</tr>
<tr>
<td>ST-5</td>
<td>Front of 556 Lincoln Avenue (12:00 p.m./12:10 p.m.)</td>
<td>62</td>
<td>58</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>63</td>
<td>59</td>
<td>53</td>
</tr>
</tbody>
</table>
Figure 2 – Daily Trend in Noise Levels at LT-1, October 3rd, 2017

Noise Levels at Noise Measurement Site LT-1
Fremont Ave, 108 feet South of Griffin Rd, Los Altos, CA
Tuesday, October 3, 2017 1:00 PM to 23:50 PM
Figure 3 – Daily Trend in Noise Levels at LT-1, October 4th, 2017

Noise Levels at Noise Measurement Site LT-1
Fremont Ave, 108 feet South of Griffin Rd, Los Altos, CA
Wednesday, October 4, 2017

L_{eq} = 69 dBA
CNEL = 69 dBA
Figure 4 – Daily Trend in Noise Levels at LT-1, October 5th, 2017
Figure 5 – Daily Trend in Noise Levels at LT-2, October 3rd, 2017
Figure 6 – Daily Trend in Noise Levels at LT-2, October 4th, 2017

Noise Levels at Noise Measurement Site LT-2
In front of 666 Lincoln Avenue, Los Altos, CA
Wednesday, October 4, 2017

L_{dn} = 63 dBA
CNEL = 63 dBA
Figure 7 – Daily Trend in Noise Levels at LT-2, October 5th, 2017

Noise Levels at Noise Measurement Site LT-2
In front of 666 Lincoln Avenue, Los Altos, CA
Thursday, October 5, 2017 12:00 AM to 01:50 PM

![Graph showing daily trend in noise levels at LT-2 on October 5th, 2017. The x-axis represents hours beginning from 00:00 to 23:00, and the y-axis represents noise levels in dBA, ranging from 30 to 100. Various lines indicate different noise metrics, such as Lmax, L(1), L(10), L(50), L(90), Lmin, and Leq (hr).]
NOISE IMPACTS AND MITIGATION MEASURES

Significance Criteria
Appendix G of the CEQA Guidelines states that a project would normally be considered to result in a significant impact if noise levels conflict with adopted environmental standards or plans, if the project would expose persons to or generate excessive groundborne vibration levels, or if noise levels generated by the project would substantially increase existing noise levels on a permanent or temporary basis. For the purposes of this analysis, the following criteria were used to quantitatively evaluate noise and vibration impacts resulting from the project:

- **Conflict with Established Standards:** A significant impact would be identified if project construction were to occur outside the hours specified in the City of Los Altos Municipal Code or if construction activities are anticipated to generate noise levels in residential districts in excess of 75 dBA $L_{\text{max}}$ between 7:00 a.m. and 7:00 p.m. on weekdays or Saturdays or 50 dBA $L_{\text{max}}$ during all other times and days.

- **Groundborne Vibration:** To avoid structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, which typically consist of buildings constructed since the 1990s. A conservative vibration limit of 0.3 in/sec PPV has been used for buildings that are found to be structurally sound but where structural damage is a major concern (see Table 3).

- **Traffic Noise Increases:** A significant permanent noise impact would occur if the project resulted in an increase of 3 dBA CNEL or greater at noise-sensitive land uses where existing or projected noise levels would exceed the noise level considered satisfactory for the affected land use (60 dBA CNEL for single-family residential areas and 65 dBA CNEL for multi-family residential areas), or an increase of 5 dBA CNEL or greater at noise-sensitive land uses where noise levels would continue to be below those considered satisfactory for the affected land use.

- **Construction Noise:** Due to the temporary nature of construction activities, construction noise levels are treated differently than operational noise levels. When construction activities are predicted to cause prolonged interference with normal activities at noise-sensitive receiver locations and exceed 60 dBA $L_{\text{eq}}$ and ambient noise levels by 5 dBA $L_{\text{eq}}$ or more, the impact would be considered significant. Prolonged interference is defined as a noise level increase that occurs for more than one year.

**Impact 1:** **Conflict with Established Standards.** The project would not conflict with local noise standards contained in the General Plan or Municipal Code. This is a less-than-significant impact.

Applicable standards, goals, and policies contained in the City of Los Altos’ General Plan and Municipal Code are summarized in the Setting section of this report. The Municipal Code limits the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work adjacent to residential properties to between the hours of 7:00 a.m. and 5:30
p.m. on weekdays and between 9:00 a.m. and 3:00 p.m. on Saturdays, with no noise generating construction allowed on Sundays or city observed holidays. Within the allowable hours specified above, construction activities are limited to 75 dBA $L_{\text{max}}$ at residential properties, when technically and economically feasible.

Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive receptors. The anticipated construction equipment to be used on the project includes backhoes, scrapers, motor graders, steel-wheel rollers, pneumatic tire rollers, manually operated compactors, asphalt pavers, milling machines, concrete trucks, cranes, drill rigs, truck mounted traffic paint stripers, and pick-up trucks. Noise generated during construction activities would result in a temporary increase in ambient noise levels. Typical noise levels from equipment that may be used during construction are shown in Table 5.

<table>
<thead>
<tr>
<th>Table 5: Typical Roadway Construction Noise Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Grader</td>
</tr>
<tr>
<td>Bulldozers</td>
</tr>
<tr>
<td>Truck</td>
</tr>
<tr>
<td>Loader</td>
</tr>
<tr>
<td>Roller</td>
</tr>
<tr>
<td>Air Compressor</td>
</tr>
<tr>
<td>Backhoe</td>
</tr>
<tr>
<td>Pneumatic Tool</td>
</tr>
<tr>
<td>Paver</td>
</tr>
<tr>
<td>Concrete Pump</td>
</tr>
</tbody>
</table>

Source: Federal Transportation Administration, 2006.

Based on the types of construction activities and equipment required for the proposed project, unshielded noise levels at 50 feet from the center of construction activities would generally range from 80 to 85 dBA $L_{\text{eq}}$ during peak periods, with the highest maximum instantaneous noise levels typically ranging from 80 to 89 dBA $L_{\text{max}}$. Noise produced by construction equipment typically attenuates over distance at a rate of about 6 dB per doubling of distance. The existing noise barrier located south of Foothill Expressway would be anticipated to provide a noise reduction of about 10 dBA to locations south of Foothill Expressway.

Residential receptors are located as close as about 50 feet to the north and south of proposed project construction. Noise levels at first row receptors north of Foothill Expressway, which are not shielded by existing noise barriers, would be exposed to noise levels exceeding the City’s 75 dBA $L_{\text{max}}$ criteria when construction is located adjacent to receptors. South of Foothill Expressway, where receptors are located behind the existing 9 foot high sound wall, construction
noise levels could occasionally exceed the threshold, but the majority of construction activities would generate noise levels of 75 dBA $L_{\text{max}}$ or less at these receptors.

Construction of the project would be limited to within the allowable hours as specified in the Municipal Code. With inclusion of the following standard noise suppression devices and techniques, project construction activities would be anticipated to meet the Municipal Code noise thresholds to the degree that is technically and economically feasible.

- Limit noise-producing signals, including horns, whistles, alarms, and bells, to safety warning purposes only;
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Unnecessary idling of internal combustion engines should be strictly prohibited.
- Locate stationary noise-generating equipment, such as air compressors or portable power generators, as far as possible from sensitive receptors as feasible. If they must be located near receptors, adequate muffling (with enclosures where feasible and appropriate) shall be used reduce noise levels at the adjacent sensitive receptors. Any enclosure openings or venting shall face away from sensitive receptors.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Construction staging areas shall be established at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- Control noise from construction workers’ radios to a point where they are not audible at existing residences bordering the project site.
- Designate a "disturbance coordinator" who would be responsible for responding to any complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., bad muffler, etc.) and will require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include in it the notice sent to neighbors regarding the construction schedule.

This impact is **less-than-significant**.

**Mitigation Measure 1: None Required.**
**Impact 2: Groundborne Vibration.** The proposed project will not result in excessive groundborne vibration at structures in the vicinity. **This is a less-than-significant impact.**

A significant impact would be identified if project construction activity or project-related vehicle traffic would result in vibration levels of 0.3 in/sec PPV or greater at nearby structures. Project-related vehicle traffic is not anticipated to generate perceptible levels of groundborne vibration at nearby structures (vibration levels are anticipated to be below 0.01 in/sec PPV). Project construction equipment to be used on the project is anticipated to include backhoes, scrapers, motor graders, steel-wheel rollers, pneumatic tire rollers, manually operated compactors, asphalt pavers, milling machines, concrete trucks, cranes, drill rigs, truck mounted traffic paint stripers, and pick-up trucks. Pile driving is not anticipated as part of the construction of the project. Construction activities with the greatest potential of generating perceptible vibration levels would include the removal of pavement and soil, the movement of heavy tracked equipment, and vibratory compacting of roadway base materials by use of a roller. Table 6 summarizes typical vibration levels associated with varying pieces of construction equipment at a distance of 25 feet.

### Table 6: Vibration Source Levels for Construction Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>PPV at 25 ft. (in/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clam shovel drop</td>
<td>0.202</td>
</tr>
<tr>
<td>Hydromill (slurry wall)</td>
<td>0.008</td>
</tr>
<tr>
<td></td>
<td>in soil</td>
</tr>
<tr>
<td></td>
<td>in rock</td>
</tr>
<tr>
<td>Vibratory Roller</td>
<td>0.210</td>
</tr>
<tr>
<td>Hoe Ram</td>
<td>0.089</td>
</tr>
<tr>
<td>Large bulldozer</td>
<td>0.089</td>
</tr>
<tr>
<td>Caisson drilling</td>
<td>0.089</td>
</tr>
<tr>
<td>Loaded trucks</td>
<td>0.076</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>0.035</td>
</tr>
<tr>
<td>Small bulldozer</td>
<td>0.003</td>
</tr>
</tbody>
</table>


A review of the anticipated construction equipment and the vibration level data provided in Table 6 indicates that vibration levels generated by proposed activities and equipment would be below the 0.3 in/sec PPV criteria when construction occurs at distances of 20 feet or greater from sensitive structures. Vibration levels generated by construction activities would be perceptible indoors and may be considered annoying at times, causing irritating secondary vibration, such as a slight rattling of windows or doors. However, architectural damage to normal residential structures would not be anticipated and vibration levels would be well below those anticipated to cause structural damage. In addition, construction would occur during daytime hours only, thus reducing the potential for residential annoyance during typical periods of rest or sleep, and the duration of vibration generating construction activities at individual locations along the project alignment would be limited as construction moves along the roadway alignment as progress occurs. This is a **less-than-significant impact.**

**Mitigation Measure 2: None Required.**
Impact 3: Permanent Traffic Noise Increases. Project generated traffic and changes to the roadway alignment would not substantially increase traffic noise levels in the area. **This is a less-than-significant impact.**

A significant permanent noise impact would occur if the project resulted in an increase of 3 dBA CNEL or greater at noise-sensitive land uses where existing or projected noise levels would exceed the noise level considered satisfactory for the affected land use (60 dBA CNEL for single-family residential areas and 65 dBA CNEL for multi-family residential areas), or an increase of 5 dBA CNEL or greater at noise-sensitive land uses where noise levels would continue to be below those considered satisfactory for the affected land use.

Traffic noise modeling was conducted using FHWA’s Traffic Noise Model (TNM v. 2.5). Roadway/site geometries were entered into the model based on digital project plans, GIS coordinates and observations documented in the field, and a review of available mapping software such as Google Earth, etc. The traffic noise model was validated to within +/- 2 dBA of measured noise levels using traffic conditions occurring during the noise monitoring survey.

Once the noise model was validated, traffic noise levels under AM and PM peak hour traffic conditions were modeled for the Existing and Project scenarios. Traffic volumes for the Existing and Project scenarios were provided by Iteris². Traffic volumes for Cumulative conditions were not provided. Table 7 summarizes the results of traffic noise modeling for the Existing and Project scenarios. Receptor locations are indicated in Figure 8. Based on a review of measured and modeled data, the CNEL at each location was calculated to be 1 dBA higher than the peak-hour traffic noise level (AM or PM) at locations north of Foothill Expressway and 2 dBA higher than the peak-hour traffic noise level at locations south of Foothill Expressway.

---

² Foothill Expressway Operational Improvements between El Monte and San Antonio Road Project, Memorandum from Rich Shinn, Venkatesh Jadhav, and Abigail Rogue, Iteris, Inc., to Leo Trujillo, Mott MacDonald, September 6, 2017.
As shown in Table 7, Existing and Project traffic noise levels currently and will continue to exceed the City of Los Altos’ established noise and land use compatibility standard of 60 dBA CNEL for residential uses in some locations (represented by ST-2, ST-4, ST-5, R-1, R-4, and R-5). Traffic noise levels are anticipated to increase by up to 1 dBA along the project alignment, attributable to roadway alignment changes. This increase would not be considered significant.

This is a less-than-significant impact.

**Mitigation Measure 3: None Required.**

<table>
<thead>
<tr>
<th>Receiver</th>
<th>Modeled $L_{eq}$ for AM Peak Hour, dBA</th>
<th>Modeled $L_{eq}$ for PM Peak Hour, dBA</th>
<th>Calculated CNEL, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Build</td>
<td>Increase over Existing</td>
</tr>
<tr>
<td>ST-1</td>
<td>57</td>
<td>56</td>
<td>-1</td>
</tr>
<tr>
<td>ST-2</td>
<td>62</td>
<td>62</td>
<td>0</td>
</tr>
<tr>
<td>ST-3</td>
<td>58</td>
<td>59</td>
<td>+1</td>
</tr>
<tr>
<td>ST-4</td>
<td>67</td>
<td>66</td>
<td>-1</td>
</tr>
<tr>
<td>ST-5</td>
<td>59</td>
<td>58</td>
<td>-1</td>
</tr>
<tr>
<td>R-1</td>
<td>59</td>
<td>59</td>
<td>0</td>
</tr>
<tr>
<td>R-2</td>
<td>57</td>
<td>57</td>
<td>0</td>
</tr>
<tr>
<td>R-3</td>
<td>58</td>
<td>58</td>
<td>0</td>
</tr>
<tr>
<td>R-4</td>
<td>62</td>
<td>61</td>
<td>-1</td>
</tr>
<tr>
<td>R-5</td>
<td>63</td>
<td>64</td>
<td>+1</td>
</tr>
</tbody>
</table>
Figure 8: Measured and Modeled Receiver Locations

- ST-1
- ST-2
- ST-3
- ST-4
- ST-5
- R-1
- R-2
- R-3
- R-4
- R-5

Legend:
- ○ Short-Term Measurement
- ▲ Modeled Receiver
- ■ Sound Barrier

Google Earth
02/21/2019
26
**Impact 4: Temporary Construction Noise Increases.** The project will not expose off-site noise-sensitive land uses to a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. **This is a less-than-significant impact.**

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time. A significant temporary increase in noise would be identified if project construction activities are predicted to exceed 60 dBA $L_{eq}$ and ambient noise levels by 5 dBA $L_{eq}$ or more over a period greater than 1 year.

Roadway alignment alterations and the addition of travel lanes along Foothill Expressway from El Monte Avenue to San Antonio Road will require the temporary use of heavy equipment that could generate high noise levels in the immediate project area. Anticipated construction activities and resulting noise levels are described in Impact 1. Typical noise levels from equipment that may be used during construction are shown in Table 5. As described in Impact 1, unshielded noise levels at 50 feet from the center of construction activities would generally range from 80 to 85 dBA $L_{eq}$ during peak periods, with the highest maximum instantaneous noise levels typically ranging from 80 to 89 dBA $L_{max}$. Noise produced by construction equipment typically attenuates over distance at a rate of about 6 dB per doubling of distance. The existing noise barrier located south of Foothill Expressway would be anticipated to provide a noise reduction of about 10 dBA to locations south of Foothill Expressway.

As indicated in Table 7, existing peak-hour noise levels are in the range of 57 to 67 dBA $L_{eq}$ at adjacent residences. Hourly average construction noise levels would exceed 60 dBA $L_{eq}$ and ambient noise levels by 5 to 15 dBA $L_{eq}$ at residences during period of heavy construction located adjacent to receptors. Construction is anticipated to occur over a total period of 120 to 150 days, with the duration of noise generating activities at individual locations along the project alignment being significantly shorter as construction moves along the alignment as progress occurs. As discussed in Impact 1, construction would occur within the daytime hours allowable by the Los Altos Municipal Code with no construction occurring on Sundays or holidays and would include standard noise suppression devices and techniques, also described in Impact 1.

This is a **less-than-significant** impact.

**Mitigation Measure 4: None Required.**
Appendix B: Traffic Operational Analysis Report
## DOCUMENT VERSION CONTROL

<table>
<thead>
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<th>DOCUMENT NAME</th>
<th>SUBMITTAL DATE</th>
<th>VERSION NO.</th>
</tr>
</thead>
<tbody>
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<td>October 9, 2017</td>
<td>0.0</td>
</tr>
<tr>
<td>Foothill Expressway Operational Analysis Report – Final Submittal</td>
<td>November 22, 2017</td>
<td>1.0</td>
</tr>
<tr>
<td>Foothill Expressway Operational Analysis Report – Final Submittal</td>
<td>August 23, 2018</td>
<td>2.0</td>
</tr>
</tbody>
</table>
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EXECUTIVE SUMMARY

The County of Santa Clara selected Iteris, Inc. (Iteris) to perform a traffic operational analysis to support the design alternatives provided by Mott MacDonald for the following signalized intersections:

- Foothill Expressway at El Monte Avenue
- Foothill Expressway at San Antonio Road

Operational analyses were performed for the following three design alternatives provided by Mott MacDonald. All alternatives include an auxiliary lane in both directions of Foothill Expressway between San Antonio Road and El Monte Avenue.

- **Alternative 1**
  - Foothill Expressway at San Antonio Road
    - Add a second NB free right-turn lane
  - Foothill Expressway at El Monte Avenue
    - Square all corners and convert SB right to right-turn overlap phasing
    - Add a third EB left-turn lane
    - Add a second WB through lane

- **Alternative 2**
  - Foothill Expressway at San Antonio Road
    - Add a third SB through lane
  - Foothill Expressway at El Monte Avenue
    - Square all corners and convert SB right to right-turn overlap phasing
    - Add a second SB right-turn lane
    - Add a second WB through lane

- **Alternative 3**
  - Foothill Expressway at San Antonio Road
    - Add a third SB through lane
    - Add a second NB free right-turn lane
  - Foothill Expressway at El Monte Avenue
    - Square all corners
    - Add a third EB left-turn lane
    - Add a second SB right-turn lane
    - Add a second WB through lane

The operational analyses of the design alternatives were performed during the following peak periods:

- **AM Peak** – 07:00 AM to 09:00 AM
- **PM Peak** – 04:30 PM to 06:30 PM

Extensive field reviews and data collection of the existing conditions were conducted by Iteris to aid in performing the traffic operational analyses. The existing conditions field reviews included verifying intersection geometries, approach speed limits, turn restrictions, adjacent land uses, signal phasing, and traffic operations at each of the project intersections. Data collection included collecting peak hour turning movement counts for the weekday AM and PM peak periods. Collision data was also collected between January 1, 2011 and December 31, 2015.
Highway Capacity Manual (HCM) 2000 reports in Traffix were generated to evaluate the vehicle delay, Levels of Service (LOS), and average queue lengths for each design alternative at each of the signalized study intersections. Based on the findings of the analysis, field studies, and cost considerations, the following improvements are recommended:

**Foothill Expressway / El Monte Avenue**
Alternative 2 is the preferred alternative for the Foothill Expressway / El Monte Avenue intersection, which includes the following improvements:

- Square all corners and convert the southbound right-turn to right-turn overlap phasing
- Add a second southbound Foothill Expressway right-turn lane
- Add a second westbound El Monte Avenue through lane

The need for the second southbound right-turn lane with right-turn overlap phasing is based on the high volume of southbound right-turn turns. In addition, the southbound right-turn overlap phasing will reduce pedestrian / vehicle conflicts and improve safety at the intersection.

**Foothill Expressway / San Antonio Road**
None of the studied alternatives resulted in significant reductions in delay at the Foothill Expressway / San Antonio Road intersection. The County can determine if any of the analyzed improvements at this intersection can be justified based on the cost of the improvements versus the slight reductions in delay and other relevant factors (e.g., potential weaving conflicts).
1.0 INTRODUCTION

The County of Santa Clara selected Iteris, Inc. (Iteris) to perform a traffic operational analysis to support the design alternatives provided by Mott MacDonald for the following signalized intersections:

- Foothill Expressway at El Monte Avenue
- Foothill Expressway at San Antonio Road

The operational analyses of design alternatives were performed during the following peak periods:

- AM Peak – 07:00 AM to 09:00 AM
- PM Peak – 04:30 PM to 06:30 PM

Appendix A provides the turning movement counts collected as part of this project.

1.1 Purpose of this Document

This purpose of this document is to summarize the results of the operational analyses to support the design alternatives provided by Mott MacDonald. AM and PM peak hour turning movement counts were collected and used to create Traffix models. Highway Capacity Manual (HCM) 2000 reports in Traffix were generated to evaluate the vehicle delay, Levels of Service (LOS), and average queue lengths for each design alternative at each of the signalized study intersections.

1.2 Organization

This document is organized in the following sections:

- **Introduction**: This section provides a brief background about the project objectives and intersection limits.
- **Existing Conditions**: This section provides a description of the existing conditions at the project intersections. In addition, a review of existing collision data is also provided in this section.
- **Operational Alternatives**: This section describes the studied alternatives for the Foothill Expressway / El Monte Avenue and Foothill Expressway / San Antonio Road intersections.
- **Operational Alternatives Analysis Results**: This section provides the analysis and results of the studied operational alternatives. Highway Capacity Manual (HCM) 2000 reports in Traffix were generated to evaluate the vehicle delay, Levels of Service (LOS), and average queue lengths for each design alternative at each study intersection.
- **Conclusion**: This section presents the findings and conclusions of the operational analysis.
2.0 EXISTING CONDITIONS

The existing conditions for Foothill Expressway at El Monte Avenue is displayed in Figure 1 below. Table 1 displays the existing conditions control delay and level of service (LOS) for Foothill Expressway at El Monte Avenue.

**Figure 1 – Foothill Expressway at El Monte Avenue - Existing Conditions**

<table>
<thead>
<tr>
<th>INTERSECTION</th>
<th>AM PEAK</th>
<th></th>
<th>PM PEAK</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control Delay</td>
<td>LOS</td>
<td>Control Delay</td>
<td>LOS</td>
</tr>
<tr>
<td>Foothill Expressway at El Monte Avenue</td>
<td>57.2</td>
<td>E+</td>
<td>79.2</td>
<td>E-</td>
</tr>
</tbody>
</table>

Currently, the intersection is signalized and has protected left turns for all approaches. Northbound and southbound U-turns are permitted along Foothill Expressway. In addition, the intersection has channelized right turns on all approaches. Approximately 225 feet from the stop line, there are “Turning Vehicles Yield to Pedestrians and Bikes” signs for the northbound right-turn (NBRT) and southbound right-turn (SBRT) channelized lanes. Although vehicles must yield to pedestrians and bikes at the NB and SB channelized right-turn lanes, the operation of the right-turn channelized lanes are considered free movements.
In addition to Iteris’ field observations, special field studies were conducted by Santa Clara County Roads and Airport staff at the Foothill Expressway / El Monte Avenue intersection. The studies were conducted during the AM peak period in May 2017 (when schools were not in session) and again in August 2017 (when schools were in session). The purpose of the studies was to evaluate the operational benefits of triple eastbound left-turn lanes, which were included in Alternatives 1 and 3 at the Foothill Expressway / El Monte Avenue intersection. The studies evaluated the lane utilization of the existing dual eastbound left-turn lanes, and observed the amount of traffic from these lanes that subsequently turns right onto San Antonio Road, approximately 1,400 feet downstream of the Foothill Expressway / El Monte Avenue intersection. Both study dates had similar results.

The existing eastbound El Monte Avenue left-turn volume during the AM peak hour is about 700 vehicles per hour (both left-turn lanes combined). The studies found that both left-turn lanes were fully utilized with an equal distribution of traffic in both lanes. In addition, it was observed that close to 100% of the traffic turning left from the second left-turn lane (i.e., the outside left-turn lane) subsequently made a right-turn onto San Antonio Road. Approximately 5% to 8% of traffic from the first (inside) left-turn lane merged into the right lane to make a right-turn onto San Antonio Road.

Figure 2 displays the existing conditions for Foothill Expressway at San Antonio Road. Table 2 displays the existing conditions control delay and level of service (LOS) for Foothill Expressway at San Antonio Road.
Currently, the intersection of Foothill Expressway at San Antonio Road is a T-intersection with no left turns allowed on southbound Foothill Expressway.

In addition to Iteris’ field observations, the Santa Clara County Department of Roads and Airports provided collision data for Foothill Expressway between San Antonio Road and El Monte Avenue for the period between January 1, 2011 and December 31, 2015. Based on a review of the collision data, there were a number of sideswipe and rear-end collisions that occurred on Foothill Expressway between the two intersections. A qualitative assessment of the collision data suggests that the frequency of these types of collisions may be reduced with the implementation of the planned improvements. The additional lanes on Foothill Expressway between San Antonio Road and El Monte Avenue are expected to reduce conflicts due to weaving maneuvers on the road segment. A summary of the collision data is shown in Table 3. Full details of all the reported collisions are included in Appendix B.

### Table 2 – Existing Conditions Control Delay and Level of Service (Foothill Expressway/San Antonio Road)

<table>
<thead>
<tr>
<th>INTERSECTION</th>
<th>AM PEAK</th>
<th>PM PEAK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control Delay</td>
<td>LOS</td>
</tr>
<tr>
<td>Foothill Expressway at San Antonio Road</td>
<td>9.5</td>
<td>A</td>
</tr>
</tbody>
</table>

Table 3 – Collision Summary

<table>
<thead>
<tr>
<th>COLLISION TYPE</th>
<th>Number of Collisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear-End</td>
<td>27</td>
</tr>
<tr>
<td>Broadside</td>
<td>7</td>
</tr>
<tr>
<td>Hit Object</td>
<td>5</td>
</tr>
<tr>
<td>Sideswipe</td>
<td>4</td>
</tr>
</tbody>
</table>
| **Total**         | **43**               

The HCM 2000 reports from Traffix were used to compare vehicle delay, Levels of Service (LOS), and average queue lengths for existing conditions and each design alternative. Appendix C provides the HCM 2000 reports from Traffix.
3.0 OPERATIONAL ALTERNATIVES

The operational analysis was performed using Traffix version 8.0 software. The timing parameters from a recent project were used for the intersection of Foothill Expressway at San Antonio Road. Timing sheets provided by the County were used for the intersection of Foothill Expressway at El Monte Avenue. The existing timing provided a benchmark to compare the vehicle delay, Levels of Service (LOS), and average queue lengths of the existing operations and operations with the design alternatives.

Table 4 below provides a summary of the most recent operational improvement Alternatives 1, 2 and 3 provided by Mott MacDonald. All alternatives include an auxiliary lane in both directions of Foothill Expressway between San Antonio Road and El Monte Avenue.
## Table 4 – Intersection Alternatives Summary

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Foothill Expressway/El Monte Avenue</th>
<th>Foothill Expressway/San Antonio Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image1" alt="Diagram 1" /></td>
<td><img src="image2" alt="Diagram 2" /></td>
</tr>
<tr>
<td></td>
<td>Square all corners + Add Third EBLT + Add Second WBT</td>
<td>Add Second NBRT</td>
</tr>
<tr>
<td>2</td>
<td><img src="image3" alt="Diagram 3" /></td>
<td><img src="image4" alt="Diagram 4" /></td>
</tr>
<tr>
<td></td>
<td>Square all corners + Add Second SBRT + Add Second WBT</td>
<td>Add Third SBT</td>
</tr>
<tr>
<td>3</td>
<td><img src="image5" alt="Diagram 5" /></td>
<td><img src="image6" alt="Diagram 6" /></td>
</tr>
<tr>
<td></td>
<td>Square all corners + Add Third EBL + Add Second WBT + Add Second SBRT</td>
<td>Add Second NBRT + Add Third SBT</td>
</tr>
</tbody>
</table>
4.0 OPERATIONAL ALTERNATIVES ANALYSIS RESULTS

This section summarizes the results generated by the HCM 2000 Operations Method in Traffix for each of the three alternatives identified above. Table 5 shows the LOS criteria based on Control Delay as specified in the HCM 2000. The results are compared to the existing conditions to identify any improvements achieved with the modifications.

Table 5 – Level of Service Criteria for Signalized Intersections (Source: HCM 2000, Exhibit 16-2)

<table>
<thead>
<tr>
<th>Level of service</th>
<th>Control delay (sec/veh)</th>
<th>General Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≤10</td>
<td>Free Flow</td>
</tr>
<tr>
<td>B</td>
<td>&gt;10 and &lt;20</td>
<td>Stable Flow (slight delays)</td>
</tr>
<tr>
<td>C</td>
<td>&gt;20 and &lt;35</td>
<td>Stable Flow (acceptable delays)</td>
</tr>
<tr>
<td>D</td>
<td>&gt;35 and &lt;55</td>
<td>Approaching Unstable Flow (tolerable delay)</td>
</tr>
<tr>
<td>E</td>
<td>&gt;55 and &lt;80</td>
<td>Unstable Flow (intolerable delay)</td>
</tr>
<tr>
<td>F</td>
<td>&gt; 80</td>
<td>Forced Flow (congested)</td>
</tr>
</tbody>
</table>

**ALTERNATIVE 1**

Alternative 1 includes the following improvements:

- Foothill Expressway at San Antonio Road
  - Add a second NB free right-turn
  - A third NB through lane north of El Monte will serve as a RT only lane at San Antonio

- Foothill Expressway at El Monte Avenue
  - Square all corners and convert SB right to right-turn overlap phasing
  - Add a third EB left-turn
  - Add a second WB through lane
  - A third SB through lane south of San Antonio will serve as a RT only lane at El Monte
Table 6 summarizes the delay per intersection approach, and the overall intersection delay and LOS under Existing, Alternative 1, Alternative 2, and Alternative 3 conditions during the AM and PM peak periods. The Traffix reports are included in Appendix C.

As shown in Table 6, Alternative 1 improvements result in a reduction of overall intersection delay and a reduction in delay for the individual movements that would receive additional capacity at Foothill Expressway and El Monte Avenue (i.e., EBL and WBT). Squaring the corners, which eliminates the free right-turn operations, resulted in increased delay for the EB and WB right-turn movements during the AM and PM peak hours. The overall intersection LOS for Foothill Expressway at El Monte Avenue improved from LOS E+ to LOS D- during the AM peak hour.

The additional capacity provided by adding the second NB free right-turn at Foothill Expressway and San Antonio Road showed minimal improvements (i.e., 0.1 to 0.3 seconds).

Table 7 compares the average queue lengths (in feet) for each movement under Existing, Alternative 1, Alternative 2, and Alternative 3 conditions during the AM and PM peak periods. Traffix reports the average queue lengths in number of cars per lane. To estimate the queue length in feet, the number of cars per lane were multiplied by 20 feet (i.e., a typical car length).

As shown in Table 7, Alternative 1 results in significant improvements in the EBL and WBT queues at Foothill Expressway and El Monte Avenue during the AM and PM peaks because of the additional lanes (i.e., EBL and WBT). In addition, squaring the SB corner and converting it to right-turn overlap phasing provided a significant improvement in queue for the SB approach during the PM peak hour. However, squaring the EB and WB corners slightly increased the EB and WB queues.

At Foothill Expressway and San Antonio Road, the additional NB right-turn lane provides slight queuing improvements during the AM and PM peak periods.

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Foothill Expressway/El Monte Avenue</th>
<th>Foothill Expressway/San Antonio Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><img src="image" alt="Square all corners + Add Second SBRT + Add Second WBT" /></td>
<td><img src="image" alt="Add Third SBT" /></td>
</tr>
</tbody>
</table>

ALTERNATIVE 2
Alternative 2 includes the following improvements:

- **Foothill Expressway at San Antonio Road**
  - Add a third SB through lane
  - A third NB through lane north of El Monte will serve as a RT only lane at San Antonio

- **Foothill Expressway at El Monte Avenue**
  - Square all corners and convert SB right to right-turn overlap phasing
  - Add a second SB right-turn lane
  - Add a second WB through lane
  - A third SB through lane south of San Antonio will serve as a RT only lane at El Monte

As shown in Table 6, Alternative 2 improvements result in a reduction of overall intersection delay during the AM and PM peak hours and a reduction in delay for the individual movements that would receive additional capacity at Foothill Expressway and El Monte Avenue (i.e., SBR and WBT) during the AM and PM peak hours. Squaring all corners, which eliminates the free right-turn operations, resulted in increased delay for the EB and WB right-turn movements during the AM and PM peak hours. Note that the improvement in delay with the second SB right-turn is not significantly greater than the improvement with Alternative 1, which only has one SB right-turn lane. This could be due to the southbound approach receiving a reduced split of the cycle length because of the additional SB right-turn lane in Alternative 2. Also, with the second SB right-turn lane, the SB right-turn would operate with a protected right-turn arrow (separate phase) which would provide more safety to pedestrians. The overall LOS improved from LOS E to LOS D during the AM peak hour and remained at LOS E during the PM peak hour.

The additional capacity provided by adding a third SB through lane at Foothill Expressway and San Antonio Road results in a 9.7 second reduction of delay for the SB through movement during the PM peak hour.

As shown in Table 7, Alternative 2 results in significant improvements in the SB right-turn and WB through queues during the AM and PM peaks hours due to the second SB right-turn lane and second WB through lane at Foothill Expressway and El Monte Avenue. However, squaring the EB and WB corners slightly increased the EB and WB queues.

At Foothill Expressway and San Antonio Road, the third SB through lane provides significant queuing improvement during the PM peak hour.
ALTERNATIVE 3

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Foothill Expressway/El Monte Avenue</th>
<th>Foothill Expressway/San Antonio Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Square all corners + Add Third EBL + Add Second WBT + Add Second SBRT</td>
<td>Add Second NBRT + Add Third SBT</td>
</tr>
</tbody>
</table>

Alternative 3 includes the following improvements:

- **Foothill Expressway at San Antonio Road**
  - Add a third SB through lane
  - Add a second NB free right-turn
  - A third NB through lane north of El Monte will serve as a RT only lane at San Antonio

- **Foothill Expressway at El Monte Avenue**
  - Square all corners
  - Add a third EB left-turn lane
  - Add a second SB right-turn lane
  - Add a second WB through lane
  - A third SB through lane south of San Antonio will serve as a RT only lane at El Monte

As shown in Table 6, Alternative 3 improvements result in a reduction of overall intersection delay and a reduction in delay for the individual movements that would receive additional capacity at Foothill Expressway and El Monte Avenue (i.e., EBL, WBT, and SBR) during the AM and PM peak hours. Squaring the EB and WB corners, which eliminates the free right-turn operations, results in increased delay for the EB and WB right-turn movements during the AM and PM peak hours. Note that the improvement in delay with the second SB right-turn is not significantly greater than the improvement with Alternative 1, which only has one SB right-turn lane. This could be due to the southbound approach receiving a reduced split of the cycle length because of the additional SB right-turn lane in Alternative 3. Also, with the second SB right-turn lane, the SB right-turn would operate with a protected right-turn arrow (separate phase) which would provide more safety to pedestrians. The overall intersection LOS for Foothill Expressway at El Monte Avenue improves from LOS E+ to LOS D- during the AM peak hour.

The additional capacity provided by adding a second NB right-turn lane at Foothill Expressway and San Antonio Road results in minimal reductions in delay. The additional capacity provided by adding a third SB through lane results in a 9.7 second reduction of delay for the SB through movement during the PM peak hour and no
improvement during the AM peak hour.

As shown in Table 7, Alternative 3 results in significant improvements in the EB left-turn, WB through, and SB right-turn queues during the AM and PM peak hours due to the third EB left-turn lane, second WB through lane, and second SB right-turn lane at Foothill Expressway and El Monte Avenue. Squaring the EB and WB corners, which eliminates the free right-turn operations, results in increased queues for EB right-turn lane during the PM peak hour and WB right-turn lane during the AM peak hour. The second SB right-turn lane provides significant improvements in queues for the right-turn lane. There was some deterioration to the queuing in the EB through movement at El Monte Avenue during the AM and PM peak hours.

At Foothill Expressway and San Antonio Road, the additional third SB through lane provides slight queuing improvement during the AM peak hour and significant queuing improvement during the PM peak hour. The additional NB right-turn provides slight queuing improvements during both the AM and PM peak periods.

Table 6 – Total Delay/Veh (s) – Alternative Comparison

<table>
<thead>
<tr>
<th>AM PEAK</th>
<th>EASTBOUND</th>
<th>WESTBOUND</th>
<th>NORTHBOUND</th>
<th>SOUTHBOUND</th>
<th>Control Delay</th>
<th>LOS</th>
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<td></td>
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<td>T</td>
<td>R</td>
<td>L</td>
<td>T</td>
<td>R</td>
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<tr>
<td>San Antonio Road</td>
<td>Existing</td>
<td>37.1</td>
<td>38.9</td>
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<td>0.8</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Alternative 1</td>
<td>37.1</td>
<td>38.9</td>
<td>12.7</td>
<td>0.5</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Alternative 2</td>
<td>37.1</td>
<td>38.9</td>
<td>12.7</td>
<td>0.8</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>Alternative 3</td>
<td>37.1</td>
<td>38.9</td>
<td>12.7</td>
<td>0.6</td>
<td>8.0</td>
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<tr>
<td>El Monte Avenue</td>
<td>Existing</td>
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<td>45.6</td>
<td>19.1</td>
<td>79.9</td>
<td>73.1</td>
</tr>
<tr>
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<td>64.8</td>
<td>56.4</td>
<td>23.4</td>
<td>81.7</td>
<td>61.4</td>
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<td>76.6</td>
<td>53.7</td>
<td>22.2</td>
<td>79.9</td>
<td>61.2</td>
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<tr>
<td></td>
<td>Alternative 3</td>
<td>64.8</td>
<td>56.4</td>
<td>23.4</td>
<td>81.7</td>
<td>61.4</td>
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</tbody>
</table>

Table 7 – Queue (ft) – Alternative Comparison

<table>
<thead>
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<th>AM PEAK</th>
<th>EASTBOUND</th>
<th>WESTBOUND</th>
<th>NORTHBOUND</th>
<th>SOUTHBOUND</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>L</td>
<td>T</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td>San Antonio Road</td>
<td>Existing</td>
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<td>200</td>
<td>340</td>
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<td></td>
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<td>160</td>
<td>200</td>
<td>340</td>
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<td>Alternative 2</td>
<td>160</td>
<td>200</td>
<td>340</td>
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<tr>
<td></td>
<td>Alternative 3</td>
<td>160</td>
<td>200</td>
<td>340</td>
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<tr>
<td>El Monte Avenue</td>
<td>Existing</td>
<td>420</td>
<td>460</td>
<td>20</td>
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<td>260</td>
<td>520</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Alternative 2</td>
<td>420</td>
<td>500</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Alternative 3</td>
<td>260</td>
<td>520</td>
<td>20</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PM PEAK</th>
<th>EASTBOUND</th>
<th>WESTBOUND</th>
<th>NORTHBOUND</th>
<th>SOUTHBOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>T</td>
<td>R</td>
<td>L</td>
</tr>
<tr>
<td></td>
<td>160</td>
<td>200</td>
<td>340</td>
<td>80</td>
</tr>
</tbody>
</table>
It should be noted, that although squaring the corners in all alternatives results in longer crosswalks at the Foothill Expressway / El Monte Avenue intersection, the recalculated pedestrian clearance minimums are within the existing cycle lengths. Only a slight redistribution of the split times were needed to accommodate the new pedestrian times, which had minimal impact on the overall operation of the intersection.

In addition to performing the analysis and summarizing the results as shown in Table 6 and Table 7, due to community concerns, additional analysis was performed for Alternative 3 at the Foothill Expressway / El Monte Avenue intersection. This analysis evaluated the feasibility to allow eastbound U-Turns, which would prevent the option of a SB right-turn overlap phase. The findings of the additional analysis showed that allowing eastbound U-Turns and preventing a SB right-turn overlap phase increased the delays and queues for the southbound right-turn movement. Allowing eastbound U-turns is therefore not recommended.

Based on the analysis and results as shown in Table 6 and Table 7, Alternative 3 appears to provide the highest operational benefit to the Foothill Expressway / El Monte Avenue intersection. This is largely due to the addition of a third eastbound El Monte Avenue left-turn lane. As mentioned in Section 2.0 (Existing Conditions), the existing eastbound left-turn volume during the AM peak hour is about 700 vehicles per hour (for both left-turn lanes combined). Typically, a left-turn volume of 700 vehicles per hour would warrant the addition of a third left-turn lane, which would significantly improve operations at the intersection. However, this is only true if all three lanes are highly utilized.

Due to the high volume of eastbound El Monte Avenue left-turn traffic that subsequently turns right onto San Antonio Road as discussed in Section 2.0 (Existing Conditions), it is projected that, even with the presence of a third eastbound left-turn lane, most of the traffic destined for San Antonio Road would continue to use the outside left-turn lane, and the new (inside) left-turn lane would be extremely underutilized. Therefore, the addition of a third eastbound El Monte Avenue left-turn lane is not expected to improve the level of service at the Foothill Expressway / El Monte Avenue intersection. Furthermore, the addition of a third eastbound left-turn lane could negatively impact traffic operations on Foothill Expressway, as vehicles destined for San Antonio Road that would use the new (inside) left-turn lane would have to merge across two lanes of traffic, creating additional traffic movement conflicts on Foothill Expressway.

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>T</th>
<th>R</th>
<th>L</th>
<th>T</th>
<th>R</th>
<th>L</th>
<th>T</th>
<th>R</th>
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<tbody>
<tr>
<td><strong>San Antonio Road</strong></td>
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<tr>
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<td>80</td>
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<td>980</td>
<td>80</td>
<td>20</td>
<td></td>
<td></td>
<td>260</td>
<td></td>
<td></td>
</tr>
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<td>640</td>
<td>980</td>
<td>80</td>
<td>60</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
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<td>640</td>
<td>980</td>
<td>80</td>
<td>20</td>
<td></td>
<td></td>
<td>180</td>
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<td></td>
</tr>
<tr>
<td><strong>El Monte Avenue</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing</td>
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<td>140</td>
<td>60</td>
<td>520</td>
<td>80</td>
<td>100</td>
<td>180</td>
<td>20</td>
</tr>
<tr>
<td>Alternative 1</td>
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<td>480</td>
<td>160</td>
<td>60</td>
<td>220</td>
<td>80</td>
<td>100</td>
<td>160</td>
<td>20</td>
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<tr>
<td>Alternative 2</td>
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<td>440</td>
<td>160</td>
<td>60</td>
<td>220</td>
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<td>160</td>
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</tr>
</tbody>
</table>
5.0 CONCLUSION

Based on the findings of the analysis, field studies, and cost considerations, the following improvements are recommended:

**Foothill Expressway / El Monte Avenue**

Alternative 2 is the preferred alternative for the Foothill Expressway / El Monte Avenue intersection, which includes the following improvements:

- Square all corners and convert the southbound right-turn to right-turn overlap phasing
- Add a second southbound Foothill Expressway right-turn lane
- Add a second westbound El Monte Avenue through lane

The need for the second southbound right-turn lane with right-turn overlap phasing is based on the high volume of southbound right-turn turns. In addition, the southbound right-turn overlap phasing will reduce pedestrian / vehicle conflicts and improve safety at the intersection.

**Foothill Expressway / San Antonio Road Intersection**

None of the studied alternatives resulted in significant reductions in delay at the Foothill Expressway / San Antonio Road intersection. The County can determine if any of the analyzed improvements at this intersection can be justified based on the cost of the improvements versus the slight reductions in delay and other relevant factors (e.g., potential weaving conflicts).
APPENDIX A – TURNING MOVEMENT COUNTS
## AM COUNTS

### Foothill Expressway & El Monte

<table>
<thead>
<tr>
<th>Count Period</th>
<th>NB</th>
<th></th>
<th></th>
<th>SB</th>
<th></th>
<th></th>
<th>WB</th>
<th></th>
<th></th>
<th>EB</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>T</td>
<td>L</td>
<td>R</td>
<td>T</td>
<td>L</td>
<td>R</td>
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<tr>
<td>7:00-7:15</td>
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<td>12</td>
<td>64</td>
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### Foothill Expressway & San Antonio

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San Antonio Rd & 1st St/Cuesta Dr

Peak Hour Summary

**Southbound Approach**

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**AM Peak Hour**

- 08:00 - 09:00

**NOON Peak Hour**

- NONE

**PM Peak Hour**

- 17:00 - 18:00

1st St/Cuesta Dr

**Eastbound Approach**

- AM: 221
- NOON: 0
- PM: 206

- AM: 0
- NOON: 0
- PM: 0

- AM: 13
- NOON: 0
- PM: 31

- AM: 66
- NOON: 0
- PM: 344

- AM: 59
- NOON: 0
- PM: 99

**Westbound Approach**

- AM: 201
- NOON: 0
- PM: 131

- AM: 111
- NOON: 0
- PM: 120

- AM: 101
- NOON: 0
- PM: 47

- AM: 0
- NOON: 0
- PM: 0

- AM: 146
- NOON: 0
- PM: 471

**Northbound Approach**

- AM: 698
- NOON: 0
- PM: 765

- AM: 1
- NOON: 0
- PM: 0

- AM: 99
- NOON: 0
- PM: 404

- AM: 7
- NOON: 0
- PM: 17

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**Total Ins & Outs**

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**Total Volume Per Leg**

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APPENDIX C – EXISTING AND ALTERNATIVE CONDITIONS
TRAFFIX HCM REPORTS
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5214 FOOTHILL/SAN ANTONIO

Cycle (sec): 110  Critical Vol./Cap.(X): 0.613
Loss Time (sec): 9  Average Delay (sec/veh): 9.5
Optimal Cycle: 119  Level Of Service: A

Street Name: FOOTHILL EXPWY  SAN ANTONIO
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L  -  T  -  R  L  -  T  -  R  L  -  T  -  R  L  -  T  -  R
Control: Protected  Protected  Split Phase  Split Phase
Rights: Ovl  Include  Include  Ovl
Min. Green: 0  78  78  0  78  0  0  0  0  32  0  32
Y+R: 5.8  5.8  5.8  5.8  5.8  5.8  4.0  4.0  4.0  5.9  5.9  5.9
Lanes: 0  0  2  0  1  0  0  2  0  0  1  0  0

Volume Module:
Base Vol: 0 1594 663 0  434 0  0  0  0  456 0  69
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
Initial Bse: 0 1594 663 0  434 0  0  0  0  456 0  69
User Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
PHF Volume: 0 1594 663 0  434 0  0  0  0  456 0  69
Reduct Vol: 0  0  0  0  0  0  0  0  0  0  0  0
Reduced Vol: 0 1594 663 0  434 0  0  0  0  456 0  69
PCE Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
MLF Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
FinalVolume: 0 1594 663 0  434 0  0  0  0  456 0  69

Saturation Flow Module:
Sat/Lane: 1900 1900  1900  1900 1900  1900  1900 1900  1900 1900  1900
Adjustment: 0.92 1.00  0.79  0.92 1.00  0.92  0.92 1.00  0.92 0.92  1.00
Lanes: 0.00 2.00  1.00  0.00 2.00  0.00  0.00 0.00  0.00 1.77 0.00  0.23
Final Sat.: 0 3800  1501  0 3800  0  0  0  0  3090 0  406

Capacity Analysis Module:
Vol/Sat: 0.00 0.42  0.44  0.00 0.11  0.00  0.00 0.00  0.15 0.00  0.17
Crit Moves: ****  ****  ****
Green Time: 0.0  72.1  102.5  0.0  72.1  0.0  0.0  0.0  0.0  30.4 0.0  30.4
Volume/Cap: 0.00 0.64  0.47  0.00 0.17  0.00  0.00 0.00  0.00 0.53 0.00  0.61
Delay/Veh: 0.0  12.7  0.8  0.0  8.0  0.0  0.0  0.0  0.0  37.1 0.0  38.9
User DelAdj: 1.00 0.45  0.43  1.00 0.43  1.00  1.00 1.00  1.00 1.00  1.00
AdjDel/Veh: 0.0  5.7  0.3  0.0  3.4  0.0  0.0  0.0  0.0  37.1 0.0  38.9
LOS by Move: A  A  A  A  A  A  A  A  A  D+  A  D+
HCM2kAvgQ: 0 17  4  0  3  0  0  0  0  8 0  10

Note: Queue reported is the number of cars per lane.

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FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5214 FOOTHILL/SAN ANTONIO

Cycle (sec): 95  Critical Vol./Cap.(X): 1.035
Loss Time (sec): 12  Average Delay (sec/veh): 78.7
Optimal Cycle: 180  Level Of Service: E-

Street Name: FOOTHILL EXPWY  SAN ANTONIO
Approach: North Bound  South Bound  East Bound  West Bound
Move: L  T  R  L  T  R  L  T  R  L  T  R
Control: Protected  Protected  Split Phase  Split Phase
Rights: Ovl  Include  Include  Ovl
Min. Green: 0  64  64  0  64  0  0  0  0  31  0  31
Y+R: 5.8  5.8  5.8  5.8  5.8  5.8  4.0  4.0  4.0  5.9  5.9  5.9
Lanes: 0  0  2  0  1  0  0  2  0  0  0  0  0  1  0  1  0  0

Volume Module: >> Count Date: 14 Sep 2016 << 4:30 - 5:30
Base Vol: 0  515  464  0  1311  0  0  0  0  893  0  43
Growth Adj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse: 0  515  464  0  1311  0  0  0  0  893  0  43
User Adj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume: 0  515  464  0  1311  0  0  0  0  893  0  43
Reduced Vol: 0  0  0  0  0  0  0  0  0  0  0  0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.79 0.92 0.67 0.92 0.92 1.00 0.92 0.62 1.00 0.92
Lanes: 0.00 2.00 1.00 0.00 2.00 0.00 0.00 0.00 0.00 0.00 0.00 0.06
Final Sat.: 0  3800  1501  0  2546  0  0  0  0  2284  0  107

Capacity Analysis Module:
Vol/Sat: 0.00 0.14 0.31 0.00 0.51 0.00 0.00 0.00 0.39 0.00 0.40
Crit Moves: ****  ****
Green Time: 0.0 56.8 84.3 0.0 56.8 0.0 0.0 0.0 27.5 0.0 27.5
Volume/Cap: 0.00 0.23 0.35 0.00 0.86 0.00 0.00 0.00 0.00 0.00 0.00 1.39
Delay/Veh: 0.0 10.0 1.1 0.0 23.1 0.0 0.0 0.0 204.7 0.0 224.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 10.0 1.1 0.0 40.6 0.0 0.0 0.0 207.3 0.0 226.4
LOS by Move: A  B+  A  A  D  A  A  A  F  A  F
HCM2kAvgQ: 0  4  3  0  21  0  0  0  32  0  49

Note: Queue reported is the number of cars per lane.
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5214 FOOTHILL/SAN ANTONIO

Cycle (sec): 110    Critical Vol./Cap.(X): 0.613
Loss Time (sec): 9    Average Delay (sec/veh): 9.4
Optimal Cycle: 119    Level Of Service: A

Street Name: FOOTHILL EXPWY    SAN ANTONIO
Approach: North Bound    South Bound    East Bound    West Bound
Movement: L - T - R    L - T - R    L - T - R    L - T - R

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Volume Module: >> Count Date: 14 Sep 2016 << 7:30 - 8:30
Base Vol: 0 1594 663 0 434 0 0 0 0 456 0 69
Growth 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
Initial Bse: 0 1594 663 0 434 0 0 0 0 456 0 69
User 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
PHF 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
PHF Volume: 0 1594 663 0 434 0 0 0 0 456 0 69
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0
PCE 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
MLF 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
Final Volume: 0 1594 663 0 434 0 0 0 0 456 0 69

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.51 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92
Lanes: 0.00 2.00 2.00 0.00 2.00 0.00 0.00 0.00 0.00 1.77 0.00 0.23
Final Sat.: 0 3800 1938 0 3800 0 0 0 0 3090 0 406

Capacity Analysis Module:
Vol/Sat: 0.00 0.42 0.34 0.00 0.11 0.00 0.00 0.00 0.00 0.15 0.00 0.17
Crit Moves: **** **** ****
Green Time: 0.0 72.1 102.5 0.0 72.1 0.0 0.0 0.0 0.0 30.4 0.0 30.4
Volume/Cap: 0.00 0.64 0.37 0.00 0.17 0.00 0.00 0.00 0.00 0.53 0.00 0.61
Delay/Veh: 0.0 12.7 0.5 0.0 8.0 0.0 0.0 0.0 0.0 37.1 0.0 38.9
User DelAdj: 1.00 0.45 0.43 1.00 0.43 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 5.7 0.2 0.0 3.4 0.0 0.0 0.0 0.0 37.1 0.0 38.9
LOS by Move: A A A A A A A A A D+ A D+
HCM2kAvgQ: 0 17 2 0 3 0 0 0 0 8 0 10

Note: Queue reported is the number of cars per lane.

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### Level Of Service Computation Report

#### 2000 HCM Operations Method (Base Volume Alternative)

**Intersection #5214 FOOTHILL/SAN ANTONIO**

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**Street Name:** FOOTHILL EXPWY                      SAN ANTONIO

**Approach:**
- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

**Movement:**
- L - T - R
- L - T - R
- L - T - R
- L - T - R

**Control:**
- Protected
- Protected
- Split Phase
- Split Phase

**Rights:**
- Ovl
- Include
- Include
- Ovl

**Min. Green:**
- 0 64 64 0 64 0 0 0 31 0 31

**Y+R:**
- 5.8 5.8 5.8 5.8 5.8 5.8 4.0 4.0 4.0 5.9 5.9 5.9

**Lanes:**
- 0 0 2 0 2 0 0 2 0 0 0 0

**Volume Module:**
- Count Date: 14 Sep 2016

**Base Vol:**
- 0 515 464
- 0 1311

**Growth 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

**Initial Bse:**
- 0 515 464
- 0 1311

**User 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

**PHF 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

**PHF Volume:**
- 0 515 464
- 0 1311

**Reduct Vol:**
- 0 0 2 0 2 0 0 2 0 0 0 0

**Reduced Vol:**
- 0 515 464
- 0 1311

**PCE 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

**MLF 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

**Final Volume:**
- 0 515 464
- 0 1311

**Saturation Flow Module:**
- Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- Adjustment: 0.92 1.00 0.50 0.92 1.00 0.92 0.92 1.00 0.92 0.62 1.00 0.92
- Lanes: 0.00 2.00 2.00 0.00 2.00 0.00 0.00 0.00 0.00 1.94 0.00 0.06
- Final Sat: 0 3800 1900

**Capacity Analysis Module:**
- Vol/Sat: 0.00 0.14 0.24 0.00 0.34 0.00 0.00 0.00 0.39 0.00 0.40
- Crit Moves: ****
- Green Time: 0.0 56.8 84.3 0.0 56.8 0.0 0.0 0.0 0.0 27.5 0.0 27.5
- Volume/Cap: 0.00 0.23 0.28 0.00 0.58 0.00 0.00 0.00 0.00 1.35 0.00 1.39
- Delay/Veh: 0.0 10.0 1.0 0.0 13.6 0.0 0.0 0.0 0.0 204.7 0.0 224.0
- User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.01 1.00 1.01
- AdjDel/Veh: 0.0 10.0 1.0 0.0 23.9 0.0 0.0 0.0 0.0 207.3 0.0 226.4
- LOS by Move: A B+ A A C A A A F A F
- HCM2kAvgQ: 0 4 1 0 13 0 0 0 32 0 49

---

**Note:** Queue reported is the number of cars per lane.
Intersection #5214 FOOTHILL/SAN ANTONIO

Cycle (sec): 110  Critical Vol./Cap.(X): 0.613
Loss Time (sec): 9  Average Delay (sec/veh): 9.4
Optimal Cycle: 119  Level Of Service: A

Street Name: FOOTHILL EXPWY  SAN ANTONIO
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L  -  T  -  R  L  -  T  -  R  L  -  T  -  R  L  -  T  -  R

Control: Protected  Protected  Split Phase  Split Phase
Rights: Ovl  Include  Include  Ovl
Min. Green: 0 78  78 0  0 0  0 32  0 32
Y+R: 5.8  5.8  5.8  5.8  5.8  5.8  4.0  4.0  4.0  5.9  5.9  5.9
Lanes: 0  0  2  0  1  0  0  3  0  0  0  0  0  1  0  1  0

Volume Module: >> Count Date: 14 Sep 2016 << 7:30 - 8:30
Base Vol: 0 1594  663 0  434 0  0 0  456 0  69
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
Initial Bse: 0 1594  663 0  434 0  0 0  456 0  69
User Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
PHF Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
PHF Volume: 0 1594  663 0  434 0  0 0  456 0  69
Reduct Vol: 0  0  0  0  0  0  0 0  0  0  0  0
Reduced Vol: 0 1594  663 0  434 0  0 0  456 0  69
PCE Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
MLF Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
FinalVolume: 0 1594  663 0  434 0  0 0  456 0  69

Saturation Flow Module:
Sat/Lane: 1900 1900  1900  1900 1900  1900  1900 1900  1900 1900  1900
Adjustment: 0.92 1.00  0.79  0.92 0.68  0.92  0.92 1.00  0.92 0.92  1.00
Lanes: 0.00 2.00  1.00  0.00 3.00  0.00  0.00 0.00  1.77 0.00  0.23
Final Sat.: 0 3800  1501 0  3876 0  0 0  3090 0  406

Capacity Analysis Module:
Vol/Sat: 0.00 0.42  0.44  0.00 0.11  0.00  0.00 0.00  0.00 0.15  0.00 0.17
Crit Moves: ****  ****  ****
Green Time: 0.0 72.1 102.5 0.0  72.1 0.0  0.0 0.0  0.0 30.4  0.0 30.4
Volume/Cap: 0.00 0.64  0.47 0.00 0.17  0.00  0.00 0.00  0.00 0.53  0.00 0.61
Delay/Veh: 0.0 12.7  0.8 0.0  8.0 0.0  0.0 0.0  0.0 37.1  0.0 38.9
User Del Adj: 1.00 0.45  0.43 1.00 0.43  1.00  1.00 1.00  1.00 1.00  1.00 1.00
Adj Del/Veh: 0.0  5.7  0.3 0.0  3.4 0.0  0.0 0.0  0.0 37.1  0.0 38.9
LOS by Move: A  A  A  A  A  A  A  A  D+  A  D+
HCM2kAvgQ: 0 17  4  0  2  0  0 0  0 8  0  10

Note: Queue reported is the number of cars per lane.
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5214 FOOTHILL/SAN ANTONIO

Cycle (sec): 95  Critical Vol./Cap.(X): 0.836
Loss Time (sec): 12  Average Delay (sec/veh): 71.8
Optimal Cycle: 107  Level Of Service: E

Street Name: FOOTHILL EXPWY  SAN ANTONIO
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L  T  R  L  T  R  L  T  R  L  T  R

<table>
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Volume Module: >> Count Date: 14 Sep 2016 << 4:30 - 5:30
Base Vol: 0 515 464 0 1311 0 0 0 893 0 43
Growth 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
Initial Bse: 0 515 464 0 1311 0 0 0 893 0 43
User 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
PHF 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
PHF Volume: 0 515 464 0 1311 0 0 0 893 0 43
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 515 464 0 1311 0 0 0 893 0 43
PCE 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
MLF 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
Final Volume: 0 515 464 0 1311 0 0 0 893 0 43

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.79 0.92 0.68 0.92 0.92 1.00 0.92 0.62 1.00 0.92
Lanes: 0.00 2.00 1.00 0.00 3.00 0.00 0.00 0.00 1.94 0.00 0.06
Final Sat.: 0 3800 1501 0 3876 0 0 0 2284 0 107

Capacity Analysis Module:
Vol/Sat: 0.00 0.14 0.31 0.00 0.34 0.00 0.00 0.00 0.00 0.39 0.00 0.40
Crit Moves: ****  ****
Green Time: 0.00 56.8 84.3 0.0 56.8 0.0 0.0 0.0 27.5 0.0 27.5
Volume/Cap: 0.00 0.23 0.35 0.00 0.57 0.00 0.00 0.00 0.00 1.35 0.00 1.39
Delay/Veh: 0.00 10.0 1.1 0.0 13.4 0.0 0.0 0.0 204.7 0.0 224.0
User DelAdj: 1.00 1.00 1.00 1.00 1.76 1.00 1.00 1.00 1.01 1.00 1.01
AdjDel/Veh: 0.00 10.0 1.1 0.0 23.6 0.0 0.0 0.0 207.3 0.0 226.4
LOS by Move: A B+ A A C A A A A A F A F
HCM2kAvgQ: 0 4 3 0 9 0 0 0 32 0 49

Note: Queue reported is the number of cars per lane.

Traffic 8.0.0715 (c) 2008 Dowling Assoc. Licensed to HIGGINS ASSOC., GILROY
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5214 FOOTHILL/SAN ANTONIO

Cycle (sec): 110  Critical Vol./Cap.(X): 0.613
Loss Time (sec): 9  Average Delay (sec/veh): 9.4
Optimal Cycle: 119  Level Of Service: A

Street Name: FOOTHILL EXPWY  SAN ANTONIO
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L - T - R  L - T - R  L - T - R  L - T - R
Control: Protected  Protected  Split Phase  Split Phase
Rights: Ovl  Include  Include  Ovl
Min. Green: 5.8 5.8 5.8 5.8 4.0 4.0 4.0 5.9 5.9 5.9
Lanes: 0 0 2 0 2 0 0 3 0 0 0 0 0 0 0 0 0 0

Volume Module: >> Count Date: 14 Sep 2016 << 7:30 - 8:30
Base Vol: 0 1594 663 0 434 0 456 0 69
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 0 1594 663 0 434 0 456 0 69
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 0 1594 663 0 434 0 456 0 69
Reduct Vol: 0 0 0 0 0 0 0 0 0
Reduced Vol: 0 1594 663 0 434 0 456 0 69
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 0 1594 663 0 434 0 456 0 69

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.50 0.92 0.68 0.92 0.92 1.00 0.92 1.00 0.92 1.00
Lanes: 0.00 2.00 2.00 0.00 3.00 0.00 0.00 0.00 1.77 0.00 0.23
Final Sat.: 0 3800 1900 0 3876 0 0 0 3090 0 406

Capacity Analysis Module:
Vol/Sat: 0.00 0.42 0.35 0.00 0.11 0.00 0.00 0.00 0.15 0.00 0.17
Crit Moves: ****  ****  ****
Green Time: 0.0 72.1 102.5 0.0 72.1 0.0 0.0 0.0 0.0 30.4 0.0 30.4
Volume/Cap: 0.0 0.64 0.37 0.0 0.17 0.00 0.00 0.00 0.00 0.53 0.00 0.61
Delay/Veh: 0.0 12.7 0.6 0.0 8.0 0.0 0.0 0.0 0.0 37.1 0.0 38.9
User DelAdj: 1.00 0.45 0.43 1.00 0.43 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 0.0 5.7 0.2 0.0 3.4 0.0 0.0 0.0 0.0 37.1 0.0 38.9
LOS by Move: A A A A A A A A A D+ A D+
HCM2kAvgQ: 0 17 2 0 2 0 0 0 0 8 0 10

Note: Queue reported is the number of cars per lane.
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5214 FOOTHILL/SAN ANTONIO

Cycle (sec): 95  Critical Vol./Cap.(X): 0.836
Loss Time (sec): 12  Average Delay (sec/veh): 71.7
Optimal Cycle: 107  Level Of Service: E

Street Name: FOOTHILL EXPWY   SAN ANTONIO
Approach: North Bound     South Bound     East Bound     West Bound
Movement: L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Control:   Protected    Protected    Split Phase    Split Phase
Rights:    Ovl            Include        Include        Ovl
Min. Green: 5.8 5.8 5.8 5.8 5.8 5.8 4.0 4.0 4.0 5.9 5.9 5.9
Lanes:     0 0 2 0 2    0 0 3 0 0    0 0 0 0 0    1 0 1 0 0
-----------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Sep 2016 << 4:30 - 5:30
Base Vol:  0 515 464     0 1311     0  0    0 893  0  43
Growth 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
Initial Bse: 0 515 464  0 1311  0 0 0 0 893 0 43
User 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
PHF Volume: 0 515 464  0 1311  0 0 0 0 893 0 43
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PHF 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
PHF Volume: 0 515 464  0 1311  0 0 0 0 893 0 43
FinalVolume: 0 515 464   0 1311  0 0 0 0 893 0 43
-----------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:  1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.50 0.92 0.68 0.92 0.92 1.00 0.92 0.62 1.00 0.92
Lanes:     0.00 2.00 2.00 0.00 3.00 0.00 0.00 0.00 1.94 0.00 0.06
Final Sat.: 0 3800 1900  0 3876  0 0 0 0 2284 0 107
-----------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:  0.00 0.14 0.24 0.00 0.34 0.00 0.00 0.00 0.00 0.39 0.00 0.40
Crit Moves: ****     ****
Green Time: 0.0 56.8  84.3 0.0 56.8  0.0 0.0 0.0 27.5 0.0 27.5
Volume/Cap: 0.00 0.23 0.28 0.00 0.57 0.00 0.00 0.00 0.00 1.35 0.00 1.39
Delay/Veh:  0.0 10.0  1.0 0.0 13.4 0.0 0.0 0.0 0.0 200.7 0.0 242.4
User DelAdj: 1.00 1.00 1.00 1.00 1.76 1.00 1.00 1.00 1.01 1.00 1.01
AdjDel/Veh: 0.0 10.0  1.0 0.0 23.6 0.0 0.0 0.0 0.0 207.3 0.0 226.4
LOS by Move: A B+  A A C A A A A F  A F
HCM2kAvgQ:  0 4 1 0 9 0 0 0 0 32 0 49

Note: Queue reported is the number of cars per lane.

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Level Of Service Computation Report

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 150  Critical Vol./Cap.(X): 0.870
Loss Time (sec): 12  Average Delay (sec/veh): 57.2
Optimal Cycle: 162  Level Of Service: E+

Street Name: FOOTHILL EXPWY  EL MONTE

Movement: L - T - R  L - T - R  L - T - R  L - T - R
------------|---------------||---------------||---------------||---------------|
Control: Protected  Protected  Protected  Protected
Min. Green: 18 56 56 18 56 56 40 66 66 10 36 36
Y+R: 5.0 5.8 5.8 4.9 5.8 5.8 5.4 5.5 5.5 5.2 5.5 5.5
Lanes: 1 0 2 0 1 1 0 2 0 1 2 0 1 0 1

Volume Module: >> Count Date: 14 Sep 2016 << 7:45 - 8:45
Base Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 86 1246 84 135 270 565 713 551 27 33 332 351
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 86 1246 84 135 270 565 713 551 27 33 332 351
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 86 1246 84 135 270 565 713 551 27 33 332 351

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 0.92 1.00 0.92 1.00 0.92 0.92 1.00 0.92
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 2.00 1.00 1.00 1.00 1.00 1.00
Final Sat.: 1748 3800 1748 1748 3800 1748 3154 1900 1748 1748 1900 1748

Capacity Analysis Module:
Vol/Sat: 0.05 0.33 0.05 0.08 0.07 0.32 0.23 0.29 0.02 0.02 0.17 0.20
Crit Moves: **** **** **** ****
Green Time: 16.7 51.9 61.1 16.7 51.9 88.9 37.0 61.1 77.8 9.3 33.3 50.0
Volume/Cap: 0.44 0.95 0.12 0.70 0.21 0.55 0.92 0.71 0.03 0.31 0.79 0.60
Delay/Veh: 74.5 66.8 30.2 88.0 37.7 21.9 76.6 45.6 19.1 79.9 73.1 49.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 74.5 66.8 30.2 88.0 37.7 21.9 76.6 45.6 19.1 79.9 73.1 49.6
LOS by Move: E  E  C  F  D+  C+  E-  D  B-  E-  E  D
HCM2kAvgQ: 4 34 2 8 5 16 21 23 1 2 17 15

Note: Queue reported is the number of cars per lane.
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 190  Critical Vol./Cap.(X): 0.795
Loss Time (sec): 12  Average Delay (sec/veh): 79.2
Optimal Cycle: 202  Level Of Service: E-

Street Name: FOOTHILL EXPWY EL MONTE

Approach: North Bound South Bound East Bound West Bound
Movement: L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control: Protected  Protected  Protected  Protected
Min. Green: 20  58  58  18  86  86  36  71  71  13  48  48
Y+R: 5.0  5.8  5.8  4.9  5.8  5.8  5.4  5.5  5.5  5.2  5.5  5.5
Lanes: 1  0  2  0  1    1  0  2  0  1    2  0  1  0  1    1  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Sep 2016 << 5:30 - 6:30
Base Vol: 82  443  42  221  1252  728  509  407  201  41  399  103
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
Initial Bse: 82  443  42  221  1252  728  509  407  201  41  399  103
User Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
PHF Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
PHF Volume: 82  443  42  221  1252  728  509  407  201  41  399  103
Reduced Vol: 82  443  42  221  1252  728  509  407  201  41  399  103
PCE Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
MLF Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
Final Volume: 82  443  42  221  1252  728  509  407  201  41  399  103
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane: 1900 1900  1900  1900 1900  1900  1900 1900  1900  1900  1900
Adjustment: 0.92 1.00  0.92  0.92 0.92  0.92  0.92 1.00  1.00  1.00  1.00
Lanes: 1.00 2.00  1.00  1.00 2.00  1.00  2.00 1.00  1.00  1.00  1.00
Final Sat.: 1748 3800  1748  1748 3800  1216  3154 1900  1748  1748 1900
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat: 0.05 0.12  0.02  0.13 0.33  0.60  0.16 0.21  0.11  0.02 0.21  0.06
Crit Moves: ****  ****  ****  ****
Green Time: 18.8 69.2  81.5  30.5 80.9 114.8  33.9 66.8  85.6  12.2 45.1  75.6
Volume/Cap: 0.47 0.32  0.06  0.79 0.77  0.99  0.91 0.61  0.26  0.36 0.88  0.15
Delay/Veh: 95.0 46.8  33.9 101.3 53.3  70.6 102.0 58.2  35.2 99.4 95.8  39.3
User DelAdj: 1.00 1.00  0.92  0.92 0.92  0.92  0.92 1.00  1.00  1.00  1.00
AdjDel/Veh: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
HCM2kAvgQ: 5  9  1  15  33  49  18  20  7  3  26  4

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 150 Critical Vol./Cap.(X): 0.770
Loss Time (sec): 12 Average Delay (sec/veh): 51.6
Optimal Cycle: 165 Level Of Service: D-

Street Name: FOOTHILL EXPWY EL MONTE
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Protected Protected Protected Protected
Min. Green: 18 65 65 18 65 65 37 60 60 10 30 30
Y+R: 5.0 5.8 5.8 4.9 5.8 5.8 5.4 5.5 5.5 5.2 5.5 5.5
Lanes: 1 0 2 0 1 1 0 2 0 1 3 0 1 0 1 1 0 2 0 1

Volume Module: >> Count Date: 14 Sep 2016 << 7:45 - 8:45
Base Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
Growth 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
Initial Bse: 86 1246 84 135 270 565 713 551 27 33 332 351
User 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
PHF 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
PHF Volume: 86 1246 84 135 270 565 713 551 27 33 332 351
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
PCE 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
MLF 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
Final Volume: 86 1246 84 135 270 565 713 551 27 33 332 351

Capacity Analysis Module:
Vol/Sat: 0.05 0.33 0.05 0.08 0.07 0.35 0.18 0.29 0.02 0.02 0.09 0.22
Crit Moves: **** **** **** ****
Green Time: 16.4 59.1 68.2 16.4 59.1 94.2 35.1 54.5 70.9 9.1 28.5 44.9
Volume/Cap: 0.45 0.83 0.11 0.71 0.18 0.56 0.76 0.80 0.04 0.31 0.46 0.73
Delay/Veh: 76.4 50.6 26.2 90.8 32.9 19.7 64.8 56.4 23.4 81.7 61.4 61.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 76.4 50.6 26.2 90.8 32.9 19.7 64.8 56.4 23.4 81.7 61.4 61.0
LoS by Move: E- D C F C- B- E E+ C F E E
HCM2kAvgQ: 4 30 2 8 4 16 13 26 1 2 8 17

Note: Queue reported is the number of cars per lane.
**FOOTHILL EXPRESSWAY**

**Level Of Service Computation Report**

2000 HCM Operations Method (Base Volume Alternative)

**Intersection #5215 FOOTHILL/EL MONTE**

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**Optimal Cycle:** 202

**Level Of Service:** E

**Street Name:** FOOTHILL EXPWY  EL MONTE

**Approach:** North Bound  South Bound  East Bound  West Bound

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<th>L - T - R</th>
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<td>Control</td>
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<td>Protected</td>
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<tr>
<td>Rights</td>
<td>Ovl</td>
<td>Ovl</td>
<td>Ovl</td>
<td>Ovl</td>
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<tr>
<td>Min. Green</td>
<td>20  72 72</td>
<td>18 100 100</td>
<td>30  57 57</td>
<td>13  40 40</td>
</tr>
<tr>
<td>Y+R</td>
<td>5.0 5.8 5.8</td>
<td>4.9 5.8 5.8</td>
<td>5.4 5.5 5.5</td>
<td>5.2 5.5 5.5</td>
</tr>
<tr>
<td>Lanes</td>
<td>1  0 2 0 1</td>
<td>1  0 2 0 1</td>
<td>3  0 1 0 1</td>
<td>1  0 2 0 1</td>
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**Volume Module:** >> Count Date: 14 Sep 2016 << 5:30 - 6:30

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<tr>
<th>Base Vol:</th>
<th>82  443 42 221 1252 728 509 407 201 41 399 103</th>
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<tbody>
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<td>Growth Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse:</td>
<td>82  443 42 221 1252 728 509 407 201 41 399 103</td>
</tr>
<tr>
<td>User Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>PHF Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>PHF Volume:</td>
<td>82  443 42 221 1252 728 509 407 201 41 399 103</td>
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<td>Reduced Vol:</td>
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<tr>
<td>PCE Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<td>MLP Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>Final Volume:</td>
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**Saturation Flow Module:**

| Sat/Lane: | 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 |
| Adjustment: | 0.92 1.00 0.85 0.92 1.00 0.85 0.70 1.00 0.85 0.92 1.00 0.85 |
| Lanes: | 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 |
| Final Sat.: | 1748 3800 1615 1748 3800 1615 3990 1900 1615 1748 3800 1615 |

**Capacity Analysis Module:**

| Vol/Sat: | 0.05 0.12 0.03 0.13 0.33 0.45 0.13 0.21 0.12 0.02 0.11 0.06 |
| Crit Moves: | **** **** **** **** |
| Green Time: | 18.8 83.3 95.5 29.6 94.1 122.3 28.2 53.6 72.4 12.2 37.6 67.2 |
| Volume/Cap: | 0.47 0.27 0.05 0.81 0.67 0.70 0.86 0.76 0.33 0.36 0.53 0.18 |
| Delay/Veh: | 95.0 36.4 25.7 105.1 40.3 27.3 98.9 75.9 45.6 99.4 75.2 45.8 |
| User DelAdj: | 0.93 0.92 0.86 1.04 1.44 1.53 0.98 0.96 0.98 0.93 0.97 1.00 |
| AdjDel/Veh: | 88.1 33.6 22.1 109.7 57.9 41.6 96.8 72.7 44.8 92.5 72.7 45.8 |
| LOS by Move: | F C C+ F E+ D F E D F E D |
| HCM2kAvgQ: | 5 8 1 15 28 29 12 24 8 3 11 4 |

**Note:** Queue reported is the number of cars per lane.
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 150 Critical Vol./Cap.(X): 0.776
Loss Time (sec): 12 Average Delay (sec/veh): 53.4
Optimal Cycle: 162 Level Of Service: D-

Street Name: FOOTHILL EXPWY EL MONTE
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Protected Protected Protected Protected
Min. Green: 18 62 62 18 62 62 40 60 60 10 30 30
Y+R: 5.0 5.8 5.8 4.9 5.8 5.8 5.4 5.5 5.5 5.2 5.5 5.5
Lanes: 1 0 2 0 1 1 0 2 0 2 2 0 1 0 1 1 0 2 0 1

Volume Module: >> Count Date: 14 Sep 2016 << 7:45 - 8:45
Base Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 86 1246 84 135 270 565 713 551 27 33 332 351
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 86 1246 84 135 270 565 713 551 27 33 332 351
Reduced Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 86 1246 84 135 270 565 713 551 27 33 332 351

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 0.92 1.00 0.46 0.83 1.00 0.85 0.92 1.00 0.85
Lanes: 1.00 2.00 1.00 1.00 2.00 2.00 1.00 1.00 1.00 1.00 2.00 1.00
Final Sat.: 1748 3800 1615 1748 3800 1748 3154 1900 1615 1748 3800 1615

Capacity Analysis Module:
Vol/Sat: 0.05 0.33 0.05 0.08 0.07 0.32 0.23 0.29 0.02 0.02 0.09 0.22
Crit Moves: **** **** **** ****
Green Time: 16.7 57.4 66.7 16.7 57.4 94.4 37.0 55.6 72.2 9.3 27.8 44.4
Volume/Cap: 0.44 0.86 0.11 0.70 0.19 0.51 0.92 0.78 0.03 0.31 0.47 0.73
Delay/Veh: 74.5 52.6 26.5 88.0 33.5 18.1 76.6 53.7 22.2 79.9 61.2 60.8
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 74.5 52.6 26.5 88.0 33.5 18.1 76.6 53.7 22.2 79.9 61.2 60.8
LOS by Move: E D- C F C- B- E- D- C+ E- E E
HCM2kAvgQ: 4 30 2 8 4 8 21 25 1 2 8 17

Note: Queue reported is the number of cars per lane.

Traffix 8.0.0715 (c) 2008 Dowling Assoc. Licensed to HIGGINS ASSOC., GILROY
**Level Of Service Computation Report**

**2000 HCM Operations Method (Base Volume Alternative)**

**Intersection #5215 FOOTHILL/EL MONTE**

**Cycle (sec):** 190  
**Critical Vol./Cap.(X):** 0.683  
**Loss Time (sec):** 12  
**Average Delay (sec/veh):** 63.4  
**Optimal Cycle:** 202  
**Level Of Service:** E

**Street Name:** FOOTHILL EXPWY EL MONTE  
**Approach:** North Bound South Bound East Bound West Bound  
**Movement:** L - T - R L - T - R L - T - R L - T - R  
**Control:** Protected Protected Protected Protected  
**Rights:** Ovl Ovl Ovl Ovl  
**Min. Green:** 20  66  66  18  94  94  36  63  63  13  40  40

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<td>407</td>
<td>201</td>
<td>41</td>
<td>399</td>
<td>103</td>
<td></td>
</tr>
</tbody>
</table>

**Saturation Flow Module:**

| Sat/Lane: | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Adjustment: | 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 |
| Lanes: | 1.00 | 2.00 | 1.00 | 2.00 | 2.00 | 1.00 | 2.00 | 1.00 | 2.00 | 1.00 | 2.00 | 1.00 |
| Final Sat.: | 1748 | 3800 | 1615 | 1748 | 3800 | 1748 | 3154 | 1900 | 1615 | 1748 | 3800 | 1615 |

**Capacity Analysis Module:**

| Vol/Sat: | 0.05 | 0.12 | 0.02 | 0.13 | 0.33 | 0.42 | 0.16 | 0.21 | 0.12 | 0.02 | 0.11 | 0.06 |
| Crit Moves: | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| Green Time: | 18.8 | 77.3 | 89.5 | 29.9 | 88.4 | 122.3 | 33.9 | 59.3 | 78.1 | 12.2 | 37.6 | 67.5 |
| Volume/Cap: | 0.47 | 0.29 | 0.05 | 0.80 | 0.71 | 0.65 | 0.91 | 0.69 | 0.30 | 0.36 | 0.53 | 0.18 |
| Delay/Veh: | 95.0 | 40.7 | 29.0 | 103.5 | 45.5 | 24.9 | 102.0 | 67.2 | 41.2 | 99.4 | 75.2 | 45.5 |
| User DelAdj: | 0.93 | 0.92 | 0.86 | 1.04 | 1.44 | 1.53 | 0.98 | 0.96 | 0.98 | 0.93 | 0.97 | 1.00 |
| AdjDel/Veh: | 88.1 | 37.5 | 24.9 | 108.0 | 65.4 | 37.9 | 99.8 | 64.3 | 40.5 | 92.5 | 72.7 | 45.5 |
| LOS by Move: | F | D+ | C | F | E | D+ | F | E | D | F | E | D |
| HCM2kAvgQ: | 5 | 9 | 1 | 15 | 30 | 14 | 18 | 22 | 8 | 3 | 11 | 4 |

**Note:** Queue reported is the number of cars per lane.

Traffic 8.0.0715 (c) 2008 Dowling Assoc. Licensed to HIGGINS ASSOC., GILROY
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 150  Critical Vol./Cap.(X): 0.770
Loss Time (sec): 12  Average Delay (sec/veh): 51.4
Optimal Cycle: 165  Level Of Service: D-

Street Name: FOOTHILL EXPWY  EL MONTE
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L  -  T  -  R  L  -  T  -  R  L  -  T  -  R  L  -  T  -  R

Control: Protected  Protected  Protected  Protected
Min. Green: 5.0  5.8  5.8  4.9  5.8  5.8  5.4  5.5  5.5  5.2  5.5  5.5
Lanes: 1  0  2  0  1  1  0  2  0  2  3  0  1  0  1  1  0  2  0  1

Volume Module: >> Count Date: 14 Sep 2016 << 7:45 - 8:45
Base Vol: 86  1246  84  135  270  565  713  551  27  33  332  351
Growth 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
Initial Bse: 86  1246  84  135  270  565  713  551  27  33  332  351
User 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
PHF 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
PHF Volume: 86  1246  84  135  270  565  713  551  27  33  332  351
Reduct Vol: 0  0  0  0  0  0  0  0  0  0  0  0
Reduced Vol: 86  1246  84  135  270  565  713  551  27  33  332  351
PCE 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
MLF 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
Final Volume: 86  1246  84  135  270  565  713  551  27  33  332  351

Saturation Flow Module:
Sat/Lane: 1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900  1900
Adjustment: 0.92  1.00  0.85  0.92  1.00  0.85  0.70  1.00  0.85  0.92  1.00  0.85
Lanes: 1.00  2.00  1.00  2.00  2.00  3.00  1.00  2.00  1.00  1.00  2.00  1.00
Final Sat.: 1748  3800  1748  3990  1900  1615  1748  3800  1748  1900  1615  1748

Capacity Analysis Module:
Vol/Sat: 0.05  0.33  0.05  0.08  0.07  0.32  0.18  0.29  0.02  0.02  0.09  0.22
Crit Moves:  ****  ****  ****  ****
Green Time: 16.4  59.1  68.2  16.4  59.1  94.2  35.1  54.5  70.9  9.1  28.5  44.9
Volume/Cap: 0.45  0.83  0.11  0.71  0.18  0.51  0.76  0.80  0.04  0.31  0.46  0.73
Delay/Veh: 76.4  50.6  26.2  90.8  32.9  18.6  64.8  56.4  23.4  81.7  61.4  61.0
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh: 76.4  50.6  26.2  90.8  32.9  18.6  64.8  56.4  23.4  81.7  61.4  61.0
LOS by Move: E-  D  C  F  C-  B-  E  E+  C  F  E  E
HCM2kAvgQ: 4  30  2  8  4  8  13  26  1  2  8  17

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 190  Critical Vol./Cap.(X): 0.647
Loss Time (sec): 12  Average Delay (sec/veh): 61.6
Optimal Cycle: 202  Level Of Service: E

Street Name: FOOTHILL EXPWY  EL MONTE
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L - T - R  L - T - R  L - T - R  L - T - R
-----------|---------------||---------------||---------------||---------------|
Control: Protected  Protected  Protected  Protected
Min. Green: 20  72  72  18  100  100  30  57  57  13  40  40
Y+R: 5.0  5.8  5.8  4.9  5.8  5.8  5.4  5.5  5.5  5.2  5.5  5.5
Lanes: 1  0  2  0  1  1  0  2  0  2  3  0  1  0  1  1  0  2  0  1
-----------|---------------||---------------||---------------||---------------|
Volume Module: >> Count Date: 14 Sep 2016 << 5:30 - 6:30
Base Vol: 82  443  42  221 1252  728  509 407  201  41  399  103
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
Initial Bse: 82  443  42  221 1252  728  509 407  201  41  399  103
User Adj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
PHF Adj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
PHF Volume: 82  443  42  221 1252  728  509 407  201  41  399  103
Reduced Vol: 82  443  42  221 1252  728  509 407  201  41  399  103
Reduct Vol: 82  443  42  221 1252  728  509 407  201  41  399  103
PCE Adj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
MLF Adj: 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
Final Volume: 82  443  42  221 1252  728  509 407  201  41  399  103
-----------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane: 1900 1900  1900  1900 1900  1900  1900 1900  1900 1900  1900 1900
Adjustment: 0.92 1.00  0.85  0.92 1.00  0.46  0.70 1.00  0.85 0.92  1.00 0.85
Lanes: 1.00 2.00  1.00  1.00 2.00  2.00  3.00 1.00  1.00 1.00  2.00 1.00
Final Sat.: 1748 3800  1615  1748 3800  1748  3990 1900  1615  1748 3800  1615
-----------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat: 0.05 0.12  0.03  0.13 0.33  0.42  0.13 0.21  0.12 0.02  0.11 0.06
Crit Moves: ****  ****  ****  ****
Green Time: 18.8 83.3  95.5  29.6 94.1 122.3  28.2 53.6 72.4 12.2 37.6 67.2
Volume/Cap: 0.47 0.27  0.05  0.81 0.67  0.65  0.86 0.76 0.33  0.36 0.53 0.18
Delay/Veh: 95.0 36.4  25.7 105.1 40.3 24.9  98.9 75.9 45.6 99.4 75.2 45.8
User DelAdj: 0.93 0.92  0.86  1.04 1.44  1.53  0.98 0.96 0.98  0.93 0.97 1.00
AdjDel/Veh: 88.1 33.6  22.1 109.7 57.9 37.9  96.8 72.7 44.8 92.5 72.7 45.8
LOS by Move: F C- C+ F E+ D+ F E D F E D
HCM2kAvgQ: 5  8  1  15  28  14  12  24  8  3  11  4
Note: Queue reported is the number of cars per lane.
## Level Of Service Computation Report

### 2000 HCM Operations Method (Base Volume Alternative)

### Intersection #5215 FOOTHILL/EL MONTE

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### Street Name: FOOTHILL EXPWY EL MONTE

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### Volume Module: >> Count Date: 14 Sep 2016 << 7:45 - 8:45

| Base Vol: | 86 1246 84 | 135 270 565 | 713 551 27 | 33 332 351 |
| Growth 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 |
| Initial Bse: | 86 1246 84 | 135 270 565 | 713 551 27 | 33 332 351 |
| User 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 |
| PHF 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 |
| PHF Volume: | 86 1246 84 | 135 270 565 | 713 551 27 | 33 332 351 |
| Reduct Vol: | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 |
| Reduced Vol: | 86 1246 84 | 135 270 565 | 713 551 27 | 33 332 351 |
| PCE 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 |
| MLP 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 |
| Final Volume: | 86 1246 84 | 135 270 565 | 713 551 27 | 33 332 351 |

### Capacity Analysis Module:

| Sat/Lane: | 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 |
| Adjustment: | 0.92 1.00 0.85 0.92 1.00 0.46 0.70 1.00 0.85 0.92 1.00 0.85 |
| Lanes: | 1.00 2.00 1.00 1.00 2.00 2.00 3.00 1.00 1.00 1.00 2.00 1.00 |
| Final Sat.: | 1748 3800 1615 1748 3800 1748 3990 1900 1615 1748 3800 1615 |

### Capacity Analysis Module:

| Vol/Sat: | 0.05 0.33 0.05 0.08 0.07 0.32 0.18 0.29 0.02 0.02 0.09 0.22 |
| Crit Moves: | **** **** **** **** |
| Green Time: | 16.4 59.1 68.2 16.4 59.1 59.1 35.1 54.5 70.9 9.1 28.5 44.9 |
| Volume/Cap: | 0.45 0.83 0.11 0.71 0.18 0.82 0.76 0.80 0.04 0.31 0.46 0.73 |
| Delay/Veh: | 76.4 50.6 26.2 90.8 32.9 55.3 64.8 56.4 23.4 81.7 61.4 61.0 |
| User DelAdj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: | 76.4 50.6 26.2 90.8 32.9 55.3 64.8 56.4 23.4 81.7 61.4 61.0 |
| LOS by Move: | E-  D  C  F  C-  E+  E  E+  C  F  E  E |

**Note:** Queue reported is the number of cars per lane.
FOOTHILL EXPRESSWAY

Level Of Service Computation Report
2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 190  Critical Vol./Cap.(X): 0.740
Loss Time (sec): 12  Average Delay (sec/veh): 68.9
Optimal Cycle: 202  Level Of Service: E

Street Name: FOOTHILL EXPWY  EL MONTE
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L - T - R  L - T - R  L - T - R  L - T - R
------------|---------------||---------------||---------------||---------------|
Control: Protected  Protected  Protected  Protected
Rights: Ovl  Include  Ovl  Ovl
Min. Green: 20  72  72  18  100  100  30  57  57  13  40  40
Y+R: 5.0  5.8  5.8  4.9  5.8  5.8  5.4  5.5  5.5  5.2  5.5  5.5
Lanes: 1  0  2  0  1  1  0  2  0  2  3  0  1  0  1  1  0  2  0  1

Volume Module: >> Count Date: 14 Sep 2016 << 5:30 - 6:30
Base Vol: 82 443 42 221 1252 728 509 407 201 41 399 103
Growth 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
Initial Bse: 82 443 42 221 1252 728 509 407 201 41 399 103
User 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
PHF 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
PHF Volume: 82 443 42 221 1252 728 509 407 201 41 399 103
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduct Vol: 82 443 42 221 1252 728 509 407 201 41 399 103
PCE 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
MLF 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
FinalVolume: 82 443 42 221 1252 728 509 407 201 41 399 103

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.85 0.92 1.00 0.46 0.70 1.00 0.85 0.92 1.00 0.85
Lanes: 1.00 2.00 1.00 2.00 2.00 3.00 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.: 1748 3800 1615 1748 3800 1748 3990 1900 1615 1748 3800 1615

Capacity Analysis Module:
Vol/Sat: 0.05 0.12 0.03 0.13 0.33 0.42 0.13 0.21 0.12 0.02 0.11 0.06
Crit Time: 18.8 83.3 95.5 29.6 94.1 94.1 28.2 53.6 72.4 12.2 37.6 67.2
Green Time: 0.47 0.27 0.05 0.81 0.67 0.84 0.86 0.76 0.33 0.36 0.53 0.18
Delay/Veh: 95.0 36.4 25.7 105.1 40.3 53.8 98.9 75.9 45.6 99.4 75.2 45.8
User DelAdj: 0.93 0.92 0.86 1.04 1.44 1.53 0.98 0.96 0.98 0.93 0.97 1.00
AdjDel/Veh: 88.1 33.6 22.1 109.7 57.9 82.1 96.8 72.7 44.8 92.5 72.7 45.8
LOS by Move: F  C-  C+  F  E+  F  F  E  D  F  E  D
HCM2kAvgQ: 5 8 1 15 28 21 12 24 8 3 11 4

Note: Queue reported is the number of cars per lane.
FOOTHILL EXPRESSWAY

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 150 Critical Vol./Cap.(X): 1.083
Loss Time (sec): 12 Average Delay (sec/veh): 94.2
Optimal Cycle: 180 Level Of Service: F

Street Name: FOOTHILL EXPWY EL MONTE

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Control: Protected Protected Protected Protected
Rights: Ovl Include Ovl Ovl
Min. Green: 18 65 65 37 60 60 10 30 30
Y+R: 5.0 5.8 5.8 4.9 5.8 5.8 5.4 5.5 5.5 5.2 5.5 5.5
Lanes: 1 0 2 0 1 1 0 2 0 1 3 0 1 0 1 1 0 2 0 1

Volume Module: >> Count Date: 14 Sep 2016 << 7:45 - 8:45
Base Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
Growth 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
Initial Bse: 86 1246 84 135 270 565 713 551 27 33 332 351
User 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
PHF 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
PHF Volume: 86 1246 84 135 270 565 713 551 27 33 332 351
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 86 1246 84 135 270 565 713 551 27 33 332 351
PCE 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
MLF 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
Final Volume: 86 1246 84 135 270 565 713 551 27 33 332 351

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.85 0.92 1.00 0.46 0.70 1.00 0.85 0.92 1.00 0.85
Lanes: 1.00 2.00 1.00 1.00 2.00 1.00 3.00 1.00 1.00 2.00 1.00 2.00
Final Sat.: 1748 3800 1615 1748 3800 874 3990 1900 1615 1748 3800 1615

Capacity Analysis Module:
Vol/Sat: 0.05 0.33 0.05 0.08 0.07 0.65 0.18 0.29 0.02 0.02 0.09 0.22
Crit Moves: **** **** **** ****
Green Time: 16.4 59.1 68.2 16.4 59.1 59.1 35.1 54.5 70.9 9.1 28.5 44.9
Volume/Cap: 0.45 0.83 0.11 0.71 0.18 1.64 0.76 0.80 0.04 0.31 0.46 0.73
Delay/Veh: 76.4 50.6 26.2 90.8 32.9 351.3 64.8 56.4 23.4 81.7 61.4 61.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 76.4 50.6 26.2 90.8 32.9 351.3 64.8 56.4 23.4 81.7 61.4 61.0
LOS by Move: E- D C F C- F E+ C F E E
HCM2kAvgQ: 4 30 2 8 4 56 13 26 1 2 8 17

Note: Queue reported is the number of cars per lane.

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FOOTHILL EXPRESSWAY

Level Of Service Computation Report

2000 HCM Operations Method (Base Volume Alternative)

Intersection #5215 FOOTHILL/EL MONTE

Cycle (sec): 190  Critical Vol./Cap.(X): 1.183
Loss Time (sec): 12  Average Delay (sec/veh): 147.7
Optimal Cycle: 202  Level Of Service: F

Street Name: FOOTHILL EXPWY  EL MONTE
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L  -  T  -  R  L  -  T  -  R  L  -  T  -  R  L  -  T  -  R
Control: Protected  Protected  Protected  Protected
Rights: Ovl  Include  Ovl  Ovl
Min. Green: 20  72  72  18  100  100  30  57  57  13  40  40
Y+R: 5.0  5.8  5.8  4.9  5.8  5.8  5.4  5.5  5.5  5.2  5.5  5.5
Lanes: 1  0  2  0  1  1  0  2  0  1  3  0  1  0  1  1  0  2  0  1

Volume Module: >> Count Date: 14 Sep 2016 << 5:30 - 6:30
Base Vol: 82  443  42  221  1252  728  509  407  201  41  399  103
Growth Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00
Initial Bse: 82  443  42  221  1252  728  509  407  201  41  399  103
User Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00
PHF Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00
PHF Volume: 82  443  42  221  1252  728  509  407  201  41  399  103
Reduct Vol: 0  0  0  0  0  0  0  0  0  0  0  0
Reduced Vol: 82  443  42  221  1252  728  509  407  201  41  399  103
PCE Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00
MLF Adj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00
Final Volume: 82  443  42  221  1252  728  509  407  201  41  399  103

Saturation Flow Module:
Sat/Lane: 1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900
Adjustment: 0.92 1.00  0.92  0.92 1.00  0.92  0.92 1.00  1.00  1.00 1.00
Lanes: 1.00 2.00  1.00  1.00 2.00  1.00  3.00 1.00  1.00  1.00 2.00
Final Sat.: 1748 3800  1615  1748 3800  874  3990 1900  1615  1748 3800

Capacity Analysis Module:
Vol/Sat: 0.05 0.12  0.03  0.13 0.33  0.83  0.13 0.21  0.12  0.02 0.11  0.06
Crit Move: ****  ****  ****  ****  ****  ****  ****  ****  ****  ****  ****  ****
Green Time: 18.8  83.3  95.5  29.6  94.1  94.1  28.2  53.6  72.4  12.2  37.6  67.2
Volume/Cap: 0.47  0.27  0.05  0.81  0.67  1.68  0.86  0.76  0.33  0.36  0.53  0.18
Delay/Veh: 95.0  36.4  25.7 105.1 40.3 368.1  98.9  75.9  45.6  99.4  75.2  45.8
User Del Adj: 0.93  0.92  0.86  1.04  1.44  1.53  0.98  0.96  0.98  0.93  0.97  1.00
Adj Del/Veh: 88.1  33.6  22.1 109.7 57.9 561.5  96.8  72.7  44.8  92.5  72.7  45.8
LOS by Move: F  C-  C+  F  E+  F  F  E  D  F  E  D
HCM2kAvgQ:  5  8  1  15  28  80  12  24  8  3  11  4

Note: Queue reported is the number of cars per lane.

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