3.4 TRANSPORTATION

Introduction

This section of the EIR evaluates the potential transportation impacts resulting from construction and operation of the SUMC Project. Potential impacts could result from the addition of project related pedestrian, bicycle, transit, and auto trips to the surrounding roadways and intersections, resulting in a substantial increase in traffic in relation to the existing traffic load and capacity of the street system, or otherwise exceed the City’s traffic-related thresholds of significance. Standards of impact significance are established on which to base the assessment of transportation impacts. Mitigation measures intended to reduce identified transportation impacts are provided.

This section of the EIR is based primarily on the Transportation Impact Analysis prepared by AECOM Transportation (Appendix C of this EIR). Other sources consulted for the preparation of this section include the City of Palo Alto’s Traffic Analysis Guidelines, and the Santa Clara County Valley Transportation Authority (VTA) Congestion Management Program’s Traffic Level of Service Analysis Guidelines.

Transportation related issues and comments identified in response letters to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. The comments that were received pertained to parking supply; automobile, transit, bicycle, and pedestrian circulation; emergency vehicle access to the hospitals; and impacts to specific roads and intersections. These comments were received from the Palo Alto Planning and Transportation Commission, Caltrans, Santa Clara County, City of Menlo Park, Stanford University, the Crescent Park Neighborhood Association, the League of Women Voters, the College Terrace Residents Association, the Hayward Area Planning Association, and individual members of the public. The Transportation Impact Analysis conducted for this EIR addressed these issues.

Existing Conditions

The Main SUMC Site and the Hoover Pavilion Site collectively represent the SUMC Sites. Most of the SUMC Sites falls within a narrow part of the City of Palo Alto that is situated between the City of Menlo Park to the northeast, and Stanford University to the southwest. Figure 2-1, in Section 2, Project Description shows the two individual sites that collectively comprise the SUMC Sites, in relation to the boundary between the Palo Alto/Menlo Park boundary, and the rest of the Stanford University campus.

1 AECOM Transportation, Stanford University Medical Center Environmental Impact Report Transportation Impact Analysis, March 2010.
Study Area Definition

Figure 3.4-1 shows the Study Area and all analyzed intersections, which are defined on Table 3.4-1 later in this section. The Study Area for this transportation analysis is bordered by Marsh Road to the north; the Bayfront Expressway (SR 84) to the northeast; the intersection of the Junipero Serra Freeway (I-280) and Sand Hill Road to the west; and the intersection of Charleston Road and Arastradero Road to the south.

Roadway Network

The regional and local roadway network, intersections, freeway segments, public transit service, and bicycle and pedestrian network are described below.

Regional Access. Regional access would primarily be provided via US 101, I-280, and State Route 84 (SR 84). El Camino Real (SR 82) provides regional as well as local access.

US 101, also known as Bayshore Freeway, is an eight lane freeway that runs the length of California. It connects the Study Area with San Francisco to the north, and San Jose and Los Angeles to the south. Project traffic can access US 101 at interchanges at Embarcadero Road, University Avenue, Willow Road, and Marsh Road.

I-280 is an eight lane freeway that runs north-south, parallel to US 101, from San Francisco in the north to San Jose in the south. Project traffic can access I-280 at the Sand Hill Road, Alpine Road, and Page Mill Road interchanges.

SR 84, also known as the Bayfront Expressway, is a six lane freeway running east-west. It crosses San Francisco Bay, and provides connections to East Bay cities such as Fremont and Oakland, and other points east. Both University Avenue and Willow Road feed into SR 84 east of US 101.

Local Access. For the most part, the roadway network surrounding the SUMC Sites follows an off-set grid street pattern. Sand Hill Road, El Camino Real, and Palm Drive roughly define the northern, eastern, and southern boundaries of the road network immediately surrounding the SUMC Sites.

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2 Direction based on Project North, which points towards Sand Hill Road. El Camino Real is conventionally described as a north-south major arterial although it runs closer to west-east in the vicinity of the SUMC Sites. In keeping with this convention, this EIR treats true northwest as Project North and describes facilities accordingly. See, e.g., Figure 2-1 and Figure 3.4-1
FIGURE 3.4-1
Transportation Analysis Study Area and Intersections

Sand Hill Road is a tree lined arterial that varies between two and four lanes wide in the immediate vicinity of the SUMC Sites, with a landscaped median, Class II bicycle lanes on both sides of the street, sidewalks that are set back from the roadway by planting strips, and runs in a southwest to northeast direction. There is a mix of residential and commercial development along both sides of the road. It serves as the northern border for the Main SUMC Site. It also connects to several other major roadways, in particular I-280, Junipero Serra Boulevard, and El Camino Real.

El Camino Real (SR 82) is a tree lined arterial that is six lanes wide (three lanes in each direction) in the vicinity of the SUMC Sites, with center turn lanes alternating with a raised median with some plantings, sidewalks on both sides of the street, and runs in a northwest to southeast direction. There is a mixture of residential, commercial, and academic (Stanford) development fronting El Camino Real. It runs the length of the San Francisco Bay peninsula, from the City of San Francisco in the north, to the City of San Jose in the south. Also, El Camino Real is classified as a truck route with parking on both sides of the roadway.

Palm Drive alternates between two and four lanes wide, and runs in a southwest to northeast direction. It acts as the main entrance or front door to the Stanford University campus. As the name implies, it is lined with palm trees along both sides of the road, located in a planting strip between the road and sidewalk. It connects to the Caltrain commuter rail station located between El Camino Real and Alma Streets. East of El Camino Real, it becomes University Avenue.

There are several other local roads surrounding the SUMC Sites that are used for internal circulation, and provide connections to surrounding neighborhoods.

Embarcadero Road is a four-lane arterial that runs east-west from the intersection of El Camino Real, through the US 101 interchange and terminates near the Palo Alto Municipal Airport. West of El Camino Real, Embarcadero Road becomes Galvez Street, which provides a link to Arboretum Road on the Stanford University campus. A short segment of Embarcadero Road underneath the Caltrain tracks is narrowed to three lanes. Embarcadero Road is classified by the City of Palo Alto as a Major Arterial roadway.

Galvez Street is a two lane collector running parallel to the south of Palm Drive. The northern side of the road features a natural landscaped area, with no commercial or residential development. Stanford University athletic facilities are located to the south, accessed from Galvez via Nelson Road and Campus Drive. It is a major entranceway to the Stanford University campus from the east, and becomes Embarcadero Road east of El Camino Real. Embarcadero Road alternates between three and six lanes, crosses El Camino Real, and continues eastward and connects with US 101.

University Avenue varies between two and four lanes and runs in an east-west direction from the Dumbarton Bridge (SR 84) in the City of East Palo Alto to the El Camino Real grade-separated interchange, where it becomes Palm Drive. From SR 84 to US 101, University Avenue is a four lane arterial. It narrows to two lanes through the residential and downtown areas of the City of Palo Alto.
Near the Caltrain overcrossing, University Avenue again widens to four lanes until it becomes Palm Drive.

*Arboretum Road* alternates between two, three, and four lanes. It connects Sand Hill Road with Galvez Street. The northern section of the road, up near Sand Hill Road travels through a more developed area, and features planted medians, and sidewalks on both sides of the street.

*Quarry Road* is a four lane arterial that runs perpendicular to Arboretum Road, runs adjacent to the SUMC Sites, and connects El Camino Real with Campus Drive on the Stanford University campus.

*Junipero Serra Boulevard* is a two lane undivided minor arterial that runs in the north-south direction, parallel to I-280. It connects Alpine Road in the north with Page Mill Road in the south. South of Page Mill Road, it becomes Foothill Expressway. With the exception of Stanford University’s golf course which straddles the road, and a few other Stanford University properties that are located west of the road, Junipero Serra Boulevard serves as the western boundary for the main part of the Stanford University campus.

*Middlefield Road* varies between two and four lanes and runs in a north-south direction, parallel to US 101. It connects Redwood City in the north with the City of Mountain View in the south. The major intersections along Middlefield Road are all signalized. The City of Palo Alto classifies Middlefield as a minor arterial.

*Alma Street* is a four lane arterial that runs in the north-south direction, parallel and immediately adjacent to the Caltrain railroad tracks. Alma Street runs south from its intersection with Palo Alto Avenue, to San Antonio Road in the City of Mountain View. From that point south, it becomes Central Expressway.

*Page Mill Road/Oregon Expressway* varies between two and four lanes and runs in an east-west direction from Skyline Boulevard (SR 35) in the west to US 101 in the east. The western part of the road, from Skyline Boulevard to I-280 is a narrow and winding two lane road. From I-280 to its intersection with Birch Street, between El Camino Real and Alma Street, Page Mill Road is a four lane divided arterial. At this point, the road continues eastward as the Oregon Expressway and connects with the US 101.

*Alpine Road* is a two lane road that originates approximately 12 miles west of the Stanford University campus, just north of Pescadero Creek County Park, and travels east and north, intersecting with Portola Road, and I-280 and eventually intersects with Junipero Serra Boulevard, just south of Sand Hill Road. The section of Alpine Road within the Study Area is classified as a minor arterial.

*Santa Cruz Avenue* starts as a four lane road at the intersection of Sand Hill Road and Alpine Road, and travels north where it forks with Alameda de las Pulgas. From the fork, it continues north and east as a two lane road, traversing a residential neighborhood in the City of Menlo Park. It terminates at El Camino Real, near downtown Menlo Park. Santa Cruz Avenue is classified as a minor arterial.
\textit{Stanford Avenue} is a two lane collector that runs in an east-west direction from Junipero Serra Boulevard in the west to Park Boulevard in the east. The road runs parallel to Page Mill Road. The section of the road east of El Camino Real has on-street parallel parking along its south side.

\textit{Marsh Road} varies between two and four lanes and runs in an east-west direction from Middlefield Road in the west to the SR 84. The two lane segment of Marsh Road becomes four lanes near its intersection with Fair Oak Avenue. It continues eastward to an interchange with the US 101, and then a short distance further to the intersection with the Bayfront Expressway. The road is classified as a local street west of Bohannon Road, and as a primary arterial east of Bohannon.

\textit{Willow Road} varies between two and four lanes and runs in an east-west direction from Alma Street in the west, to SR 84 in the east. It intersects Middlefield Road and Bayshore Freeway (US 101), and runs parallel to Marsh Road and University Avenue. It is classified as a primary arterial from Bayfront Expressway to Middlefield Road.

\textbf{Study Area Intersections.} The traffic study analyzed a total of 66 intersections. Sixty of these intersections are signalized and the following six are unsignalized:

- Galvez Street/Arboretum Road
- Stanford Road/Bowdoin Street
- I-280 Northbound Off-Ramp/Alpine Road
- I-280 Southbound Off-Ramp/Alpine Road
- Page Mill/I-280 Northbound Off-Ramp
- Page Mill/I-280 Southbound Off-Ramp

The Transportation Impact Analysis analyzed a total of 66 intersections in the City of Palo Alto, City of Menlo Park, and City of East Palo Alto. Four intersections are within Santa Clara County. Among these intersections is the Durand Way Extension/Welch Road intersection in the City of Palo Alto; this intersection would be constructed as part of the SUMC Project and does not currently exist. This intersection is analyzed under Future Conditions. The location of each intersection is indicated on Figure 3.4-1. These study locations were chosen to represent those intersections deemed most likely to experience increases in traffic due to implementation of the SUMC Project, and all locations that could potentially experience significant project related impacts, and are shown below in Table 3.4-1.

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3 The 66 intersections include five intersections that were split into two directions, including Junipero Serra Boulevard and Campus Drive, Marsh Road and US 101, Welch Road and Pasteur Drive, I-280 and Alpine Road, and I-280 and Page Mill Road.
<table>
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Table 3.4-1
Study Intersections

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Note:

a. Two separate intersections analyzed as a single intersection because of their proximity to each other.

Residential Roadway Segments. Eight residential roadway segments were analyzed, and are shown in Figure 3.4-1:

- Santa Cruz Avenue, north of Sand Hill Road
- Sharon Road, north of Sharon Park Drive
- Stanford Avenue, north of Sand Hill Road
- Leland Avenue, north of Sand Hill Road
- Vine Street, north of Sand Hill Road
- Hawthorne Avenue, east of Alma Street
- Everett Avenue, east of Alma Street
- Hamilton Avenue, between Chaucer Street and Lincoln Avenue

Minor Arterials and Collectors. The following ten minor arterial and collector roadway segments were analyzed:

- Marsh Road, west of US 101
- Sand Hill Road, east of Santa Cruz Avenue
- Willow Road, east of Middlefield Road
- Willow Road, west of Middlefield Road
- Alpine Road, west of Junipero Serra Boulevard
- Middlefield Road, north of Ravenswood Avenue
- Middlefield Road, south of Ravenswood Avenue
- Ravenswood Avenue, east of El Camino Real
• Santa Cruz Avenue, west of El Camino Real
• Valparaiso Avenue, west of El Camino Real

Freeway Segments. The following six freeway segments were analyzed:

• US 101 north of University Avenue
• US 101 south of University Avenue
• US 101 south of Embarcadero/Oregon Expressway
• I-280 north of Sand Hill Road
• I-280 south of Alpine Road
• I-280 south of Page Mill Road

Existing Conditions

Signalized Intersections. The current procedures adopted for intersection operational analysis in Santa Clara County are from the Highway Capacity Manual (HCM) 2000. HCM 2000 analysis methods were applied using the TRAFFIX software package (version 8.0) per the requirements of the Santa Clara County Valley Transportation Authority (VTA), the designated Congestion Management Agency (CMA) for Santa Clara County. This methodology measures the operational performance of signalized intersections in terms of four measures: average control delay, critical volume to capacity ratio, average critical delay, and level of service (LOS).

TRAFFIX simulates the HCM 2000 analysis methodology. TRAFFIX evaluates intersection operations based on both average vehicle delay and critical movement delay. The Santa Clara County CMA and the City of Palo Alto require the use of TRAFFIX and the evaluation of operations using critical movement delay. In addition to calculating expected vehicle delay on which level of service is based, TRAFFIX also calculates optimal signal cycle length and intersection queuing.

• Control delay includes initial deceleration delay, queue move-up time, stopped delay, and acceleration delay. Average control delay weights the delay per movement according to the traffic volumes for that movement. Level of service for signalized intersections is defined in terms of control delay (see Table 3.4-2).

• The critical volume to capacity (V/C) ratio is an approximate indicator of the overall level of congestion at an intersection. The critical V/C ratio depends on the conflicting critical lane flow rates and the signal phasing. V/C is equal to 1.0 when the flow rate equals capacity. When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.

• Average critical delay weights the delay for the critical (conflicting) movements based on the traffic volume for that movement.
Table 3.4-2
Signalized Intersection Level of Service Thresholds

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<td>delay ≤ 10.0</td>
</tr>
<tr>
<td>B+</td>
<td>10.0 &lt; delay ≤ 12.0</td>
</tr>
<tr>
<td>B</td>
<td>12.0 &lt; delay ≤ 18.0</td>
</tr>
<tr>
<td>B-</td>
<td>18.0 &lt; delay ≤ 20.0</td>
</tr>
<tr>
<td>C+</td>
<td>20.0 &lt; delay ≤ 23.0</td>
</tr>
<tr>
<td>C</td>
<td>23.0 &lt; delay ≤ 32.0</td>
</tr>
<tr>
<td>C-</td>
<td>32.0 &lt; delay ≤ 35.0</td>
</tr>
<tr>
<td>D+</td>
<td>35.0 &lt; delay ≤ 39.0</td>
</tr>
<tr>
<td>D</td>
<td>39.0 &lt; delay ≤ 51.0</td>
</tr>
<tr>
<td>D-</td>
<td>51.0 &lt; delay ≤ 55.0</td>
</tr>
<tr>
<td>E+</td>
<td>55.0 &lt; delay ≤ 60.0</td>
</tr>
<tr>
<td>E</td>
<td>60.0 &lt; delay ≤ 75.0</td>
</tr>
<tr>
<td>E-</td>
<td>75.0 &lt; delay ≤ 80.0</td>
</tr>
<tr>
<td>F</td>
<td>delay &gt; 80.0</td>
</tr>
</tbody>
</table>


Unsignalized Intersections. Traffic conditions at unsignalized intersections were also evaluated using the HCM 2000 method, and TRAFFIX. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side-street stop-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street and for the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. At four-way stop-controlled intersections, LOS is based on the average delay experienced on all approaches. Table 3.4-3 summarizes the relationship between delay and LOS for unsignalized intersections.

Table 3.4-3
Unsignalized Intersection LOS Criteria

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description</th>
<th>Average Control Delay Per Vehicle (Seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Little or no delay</td>
<td>&lt; 10.0</td>
</tr>
<tr>
<td>B</td>
<td>Short traffic delays</td>
<td>10.0 &lt; delay &lt; 15.0</td>
</tr>
<tr>
<td>C</td>
<td>Average traffic delays</td>
<td>15.0 &lt; delay &lt; 25.0</td>
</tr>
<tr>
<td>D</td>
<td>Long traffic delays</td>
<td>25.0 &lt; delay &lt; 35.0</td>
</tr>
<tr>
<td>E</td>
<td>Very long traffic delays</td>
<td>35.0 &lt; delay &lt; 50.0</td>
</tr>
<tr>
<td>F</td>
<td>Extreme traffic delays with intersection capacity exceeded</td>
<td>&gt; 50.0</td>
</tr>
</tbody>
</table>

Residential Roadway Segments. The Traffic Infusion on Residential Environment (TIRE) index was used to evaluate operating conditions for residential streets. TIRE is a numerical representation of a resident’s perception of the effect of street traffic on activities such as walking, cycling, and children playing, as well as on the ability to maneuver an automobile in and out of residential driveways. According to TIRE, a given change in traffic volume would cause a greater impact to a residential environment on a relatively quiet residential street with a low pre-existing (before implementation of the SUMC Project) traffic volume than it would on a street with a higher pre-existing volume. An increase in the index of 0.10 is approximately equivalent to an increase in average daily traffic (ADT) of between 20 and 30 percent.

Table 3.4-4 shows the correlation between daily volumes and the corresponding TIRE Index value. As applied in the City of Palo Alto, streets with TIRE levels above 3.0 are considered traffic-dominated, while those with indexes below 3.0 are considered to be better suited for residential activities. For Menlo Park collector and minor arterial street segments, average daily trips were calculated, but not compared to the TIRE index because Menlo Park uses a different methodology based on average daily trips (ADT) without and with the SUMC Project, described further under Standards of Significance.

Freeway Segments. The adopted measure for freeway LOS evaluation in Santa Clara County is density, expressed as passenger cars per mile per lane (pcpmp1). The analysis procedures are outlined in HCM 2000, but LOS D/E and E/F density thresholds are modified here to reflect Santa Clara County conditions. The LOS thresholds for freeway segments are presented in Table 3.4-5.

Existing Traffic Volumes and Levels of Service (LOS)

Intersections. Peak Hour generally occurs between 7:00 a.m. to 9:00 a.m., and between 4:00 p.m. to 6:00 p.m. Turning movement volumes used in the Transportation Impact Analysis were obtained from the most recent Congestion Management Agency (CMA) annual monitoring counts as well as new collected counts. This traffic count data was supplemented with additional counts conducted in October 2007, January 2008, and January 2009. For each intersection count period, the hour with the highest traffic volume was identified as the Peak Hour. The existing traffic volumes for each of the analyzed intersections can be seen in the Transportation Impact Analysis prepared by AECOM Transportation (Appendix C of this EIR).

The existing Peak Hour traffic volumes were used with the existing lane configurations and signal phasing (for signalized intersections) as inputs into the LOS calculations to evaluate current operations and are summarized in Table 3.4-6. The existing intersection lane configurations and traffic control devices (stop signs or traffic signals) are shown in the Transportation Impact Analysis included in Appendix C of this EIR.
### Table 3.4-4
TIRE Index

<table>
<thead>
<tr>
<th>TIRE Index</th>
<th>Start Daily Volume</th>
<th>End Daily Volume</th>
<th>Volume to Cause Traffic Volume Description</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>+0.1 Change in TIRE Index</td>
</tr>
<tr>
<td>1.5</td>
<td>29</td>
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<td>16 14 12</td>
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<td>45</td>
<td>56</td>
<td>12 13 14</td>
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<td>1.8</td>
<td>57</td>
<td>70</td>
<td>14 17 19</td>
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<td>71</td>
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</tr>
<tr>
<td>2.0</td>
<td>90</td>
<td>110</td>
<td>21 26 30</td>
</tr>
<tr>
<td>2.1</td>
<td>111</td>
<td>140</td>
<td>30 35 40</td>
</tr>
<tr>
<td>2.2</td>
<td>141</td>
<td>180</td>
<td>40 40 40</td>
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<tr>
<td>2.3</td>
<td>181</td>
<td>220</td>
<td>40 50 60</td>
</tr>
<tr>
<td>2.4</td>
<td>221</td>
<td>280</td>
<td>60 65 70</td>
</tr>
<tr>
<td>2.5</td>
<td>281</td>
<td>350</td>
<td>70 85 100</td>
</tr>
<tr>
<td>2.6</td>
<td>351</td>
<td>450</td>
<td>100 105 110</td>
</tr>
<tr>
<td>2.7</td>
<td>451</td>
<td>560</td>
<td>110 130 150</td>
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<tr>
<td>2.8</td>
<td>561</td>
<td>710</td>
<td>150 165 180</td>
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<tr>
<td>2.9</td>
<td>711</td>
<td>890</td>
<td>180 195 210</td>
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<tr>
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<td>891</td>
<td>1100</td>
<td>210 255 300</td>
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<td>1101</td>
<td>1400</td>
<td>300 350 400</td>
</tr>
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<td>3.2</td>
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</tr>
<tr>
<td>3.4</td>
<td>2201</td>
<td>2800</td>
<td>600 650 700</td>
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<td>2801</td>
<td>3500</td>
<td>700 850 1000</td>
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<td>3501</td>
<td>4500</td>
<td>1000 1050 1100</td>
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<td>5600</td>
<td>1100 1300 1500</td>
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<td>7100</td>
<td>1500 1650 1800</td>
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<td>7101</td>
<td>8900</td>
<td>1800 1950 2100</td>
</tr>
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<td>8901</td>
<td>11000</td>
<td>2100 2550 3000</td>
</tr>
<tr>
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<td>11001</td>
<td>14000</td>
<td>3000 3500 4000</td>
</tr>
<tr>
<td>4.2</td>
<td>14001</td>
<td>18000</td>
<td>4000 4000 4000</td>
</tr>
<tr>
<td>4.3</td>
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<td>4.4</td>
<td>22001</td>
<td>28000</td>
<td>6000 6500 7000</td>
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<td>28001</td>
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<td>7000 8500 10000</td>
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<td>35001</td>
<td>45000</td>
<td>10000 10500 11000</td>
</tr>
<tr>
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<td>45001</td>
<td>56000</td>
<td>11000 13000 15000</td>
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<td>4.8</td>
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<td>15000 16500 18000</td>
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<td>71001</td>
<td>89000</td>
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<tr>
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<td>89001</td>
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### Table 3.4-5
Level of Service Thresholds for Freeway Segments

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<thead>
<tr>
<th>Level of Service</th>
<th>Density (passenger cars/mile/lane)</th>
<th>Speed (miles/hour)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>density (\leq 11.0)</td>
<td>67.0 (\leq) speed</td>
</tr>
<tr>
<td>B</td>
<td>11.0 (&lt;) density (\leq 18.0)</td>
<td>66.5 (&lt;) speed (&lt; 67.0)</td>
</tr>
<tr>
<td>C</td>
<td>18.0 (&lt;) density (\leq 26.0)</td>
<td>66.0 (&lt;) speed (&lt; 66.5)</td>
</tr>
<tr>
<td>D</td>
<td>26.0 (&lt;) density (\leq 46.0)</td>
<td>46.0 (&lt;) speed (&lt; 46.0)</td>
</tr>
<tr>
<td>E</td>
<td>46.0 (&lt;) density (\leq 58.0)</td>
<td>35.0 (&lt;) speed (&lt; 46.0)</td>
</tr>
<tr>
<td>F</td>
<td>58.0 (&lt;) density speed (&lt; 35.0)</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Traffic Level of Service Analysis Guidelines, VTA, June 2003.*

### Table 3.4-6
Existing Peak Hour Intersection Level of Service

<table>
<thead>
<tr>
<th>#</th>
<th>Intersection</th>
<th>AM</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>LOS</td>
<td>Avg Delay</td>
<td>Critical (V/C)</td>
<td>Avg Crit Delay</td>
<td>LOS</td>
<td>Avg Delay</td>
<td>Critical (V/C)</td>
<td>Avg Crit Delay</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>El Camino Real/Valparaiso Avenue-Glenwood Avenue</td>
<td>C-</td>
<td>33.1</td>
<td>0.672</td>
<td>34.3</td>
<td></td>
<td>D</td>
<td>40.4</td>
<td>0.727</td>
<td>42.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>El Camino Real/Santa Cruz Avenue</td>
<td>B</td>
<td>12.2</td>
<td>0.503</td>
<td>11.7</td>
<td>B</td>
<td>17.5</td>
<td>0.568</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>El Camino Real/Ravenswood Avenue-Menlo Avenue</td>
<td>D</td>
<td>40</td>
<td>0.786</td>
<td>42.6</td>
<td>D</td>
<td>46.6</td>
<td>0.847</td>
<td>56.9</td>
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<tr>
<td>4</td>
<td>El Camino Real/Roble Avenue</td>
<td>B+</td>
<td>10.4</td>
<td>0.427</td>
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<td>B+</td>
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<td>El Camino Real/Middle Avenue</td>
<td>C</td>
<td>24.2</td>
<td>0.694</td>
<td>28.9</td>
<td>D+</td>
<td>36.5</td>
<td>0.822</td>
<td>39.6</td>
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<tr>
<td>6</td>
<td>El Camino Real/Cambridge Avenue</td>
<td>B</td>
<td>13.4</td>
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<td>12.4</td>
<td>0.507</td>
<td>6.7</td>
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<tr>
<td>7</td>
<td>El Camino Real/Sand Hill Road-Alma Street</td>
<td>C</td>
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<td>0.567</td>
<td>34.2</td>
<td>D+</td>
<td>35.5</td>
<td>0.618</td>
<td>42.3</td>
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</tr>
<tr>
<td>8</td>
<td>El Camino Real/Quarry Road</td>
<td>B</td>
<td>13.7</td>
<td>0.369</td>
<td>18.5</td>
<td>C</td>
<td>23</td>
<td>0.478</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>9</td>
<td>Alma Street/Lytton Avenue</td>
<td>B</td>
<td>16.7</td>
<td>0.517</td>
<td>16.8</td>
<td>C</td>
<td>25.5</td>
<td>0.848</td>
<td>30.4</td>
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<tr>
<td>10</td>
<td>El Camino Real/University Avenue-Palm Drive</td>
<td>C</td>
<td>30.1</td>
<td>0.714</td>
<td>33.4</td>
<td>D+</td>
<td>37.6</td>
<td>0.79</td>
<td>41.6</td>
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</tr>
<tr>
<td>11</td>
<td>El Camino Real/Embarcadero Road-Galvez Street</td>
<td>D</td>
<td>44.7</td>
<td>0.729</td>
<td>47.5</td>
<td>D</td>
<td>45.4</td>
<td>0.753</td>
<td>48.1</td>
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<td>23.1</td>
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<td>33.9</td>
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</table>
### Table 3.4-6
Existing Peak Hour Intersection Level of Service

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<th>Intersection</th>
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<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LOS</td>
<td>Avg Delay</td>
</tr>
<tr>
<td>17</td>
<td>Woodland Avenue/University Avenue</td>
<td>C</td>
<td>31.2</td>
</tr>
<tr>
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<td>Middlefield Road/University Avenue</td>
<td>C</td>
<td>26.1</td>
</tr>
<tr>
<td>21</td>
<td>Middlefield Road/Embarcadero Road</td>
<td>D+</td>
<td>37.3</td>
</tr>
<tr>
<td>22</td>
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<td>39</td>
<td>Alma Street/Charleston Road</td>
<td>D</td>
<td>39.4</td>
</tr>
<tr>
<td>40</td>
<td>Middlefield Road/Charleston Road</td>
<td>D</td>
<td>39.4</td>
</tr>
<tr>
<td>41</td>
<td>Middlefield Road/Hamilton Avenue</td>
<td>B-</td>
<td>18.5</td>
</tr>
<tr>
<td>42</td>
<td>Alma Street/Hamilton Avenue</td>
<td>B+</td>
<td>11.3</td>
</tr>
<tr>
<td>43</td>
<td>University Drive/Santa Cruz Avenue</td>
<td>C+</td>
<td>21.8</td>
</tr>
<tr>
<td>#</td>
<td>Intersection</td>
<td>AM</td>
<td>PM</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------</td>
<td>---------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LOS</td>
<td>V/C</td>
</tr>
<tr>
<td>44</td>
<td>El Camino Real/Oak Grove Avenue</td>
<td>C</td>
<td>28.9</td>
</tr>
<tr>
<td>45</td>
<td>Middlefield Road/Ringwood Avenue</td>
<td>C</td>
<td>28.7</td>
</tr>
<tr>
<td>46</td>
<td>Middlefield Road/Ravenswood Avenue</td>
<td>C+</td>
<td>21.1</td>
</tr>
<tr>
<td>47</td>
<td>El Camino Real/Encinal Road</td>
<td>B</td>
<td>17.7</td>
</tr>
<tr>
<td>48</td>
<td>Bay Road/Marsh Road</td>
<td>B</td>
<td>12.4</td>
</tr>
<tr>
<td>49</td>
<td>Marsh Road/US 101 SB Off-Ramp</td>
<td>B</td>
<td>16.8</td>
</tr>
<tr>
<td>50</td>
<td>Marsh Road/US 101 NB Off-Ramp</td>
<td>B</td>
<td>14</td>
</tr>
<tr>
<td>51</td>
<td>Bay Road/Willow Road</td>
<td>B-</td>
<td>18.4</td>
</tr>
<tr>
<td>52</td>
<td>Bayfront Expressway/Willow Road</td>
<td>C</td>
<td>28.3</td>
</tr>
<tr>
<td>53</td>
<td>University Avenue/Bayfront Expressway</td>
<td>C</td>
<td>24.7</td>
</tr>
<tr>
<td>54</td>
<td>Bay Road/University Avenue</td>
<td>C-</td>
<td>34.5</td>
</tr>
<tr>
<td>55</td>
<td>Donohoe Street/University Avenue</td>
<td>D-</td>
<td>51.9</td>
</tr>
<tr>
<td>56</td>
<td>Welch Road/Quarry Road</td>
<td>C+</td>
<td>20.8</td>
</tr>
<tr>
<td>57</td>
<td>Durand Way/Sand Hill Road</td>
<td>A</td>
<td>6.1</td>
</tr>
<tr>
<td>58</td>
<td>Pasteur Drive NB/Welch Road</td>
<td>A</td>
<td>8.4</td>
</tr>
<tr>
<td>59</td>
<td>Pasteur Drive SB/Welch Road</td>
<td>B+</td>
<td>10.6</td>
</tr>
<tr>
<td>60</td>
<td>Durand Way Extension/Welch Road</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>61</td>
<td>Bowdoin Street/Stanford Road/(unsignalized)</td>
<td>B</td>
<td>13.5</td>
</tr>
<tr>
<td>62</td>
<td>Alpine Road/I-280 NB Off-Ramp</td>
<td>F</td>
<td>158.1</td>
</tr>
<tr>
<td>63</td>
<td>Alpine Road/I-280 SB Off-Ramp</td>
<td>F</td>
<td>80.7</td>
</tr>
<tr>
<td>64</td>
<td>Page Mill/I-280 NB Off-Ramp/(unsignalized)</td>
<td>D</td>
<td>30.9</td>
</tr>
<tr>
<td>65</td>
<td>Page Mill Road/I-280 SB Off-Ramp</td>
<td>F</td>
<td>98</td>
</tr>
<tr>
<td>66</td>
<td>Foothill Expressway/Arastradero Road</td>
<td>E</td>
<td>64.1</td>
</tr>
</tbody>
</table>

Source: City of Palo Alto, City of Menlo Park and AECOM March 2008.
Note: Shading indicates intersection operating at LOS E or F.
Based on Santa Clara County Congestion Management Program (CMP) Traffic Impact Analysis (TIA) requirements, all intersections operate within satisfactory LOS (LOS D or better) during the AM Peak Hour except for the following five intersections which are shaded in Table 3.4-6:

- Junipero Serra Boulevard-Foothill Expressway/Page Mill Road (LOS F) [intersection #23]
- I-280 NB Off-Ramp/Alpine Road (LOS F) [intersection #62]
- I-280 SB Off-Ramp/Alpine Road (LOS F) [intersection #63]
- Foothill Expressway/Arastradero Road (LOS E) [intersection #66]
- Page Mill Road/I-280 SB Off-Ramp (LOS F) [intersection #65]

During the PM Peak Hour, the following seven intersections operate at unsatisfactory levels of service:

- Junipero Serra Boulevard-Foothill Expressway/Page Mill Rd (LOS F) [intersection #23]
- Galvez Street/Arboretum Road (LOS F) [intersection #37]
- Willow Road/Bayfront Expressway (LOS E) [intersection #52]
- University Avenue/Bayfront Expressway (LOS E) [intersection #53]
- Bay Road/University Avenue (LOS E) [intersection #54]
- I-280 NB Off-Ramp/Alpine Road (LOS F) [intersection #62]
- Foothill Expressway/Arastradero Road (LOS E) [intersection #66]

Residential Roadway Segments. Twenty-four-hour tube counts were taken at each of the study residential roadway segments. The Average Daily Traffic (ADT) for residential roads identified in the study is shown in Table 3.4-7. The volumes shown in the table are for both directions of travel. This table also notes the existing TIRE index. Santa Cruz Avenue, Sharon Road, Hawthorne Avenue, Everett Avenue, and Hamilton Avenue all have indexes above 3.0.

<table>
<thead>
<tr>
<th>Residential Segment</th>
<th>City/Jurisdiction</th>
<th>ADT</th>
<th>TIRE Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Cruz Avenue</td>
<td>North of Sand Hill Road</td>
<td>Menlo Park</td>
<td>20,515</td>
</tr>
<tr>
<td>Sharon Road</td>
<td>North of Sharon Park Drive</td>
<td>Menlo Park</td>
<td>4,046</td>
</tr>
<tr>
<td>Stanford Avenue</td>
<td>North of Sand Hill Road</td>
<td>Menlo Park</td>
<td>158</td>
</tr>
<tr>
<td>Leland Avenue</td>
<td>North of Sand Hill Road</td>
<td>Menlo Park</td>
<td>286</td>
</tr>
<tr>
<td>Vine Street</td>
<td>North of Sand Hill Road</td>
<td>Menlo Park</td>
<td>333</td>
</tr>
<tr>
<td>Hawthorne Avenue</td>
<td>East of Alma Street</td>
<td>Palo Alto</td>
<td>1,703</td>
</tr>
<tr>
<td>Everett Avenue</td>
<td>East of Alma Street</td>
<td>Palo Alto</td>
<td>1,366</td>
</tr>
<tr>
<td>Hamilton Avenue</td>
<td>Between Chaucer Street and Lincoln Avenue</td>
<td>Palo Alto</td>
<td>2,454</td>
</tr>
</tbody>
</table>

Source: AECOM Transportation, October 2007 and 2009 counts.

Note:
Shaded rows indicates TIRE index greater than 3.0.
Freeway Segments. The Average Annual Daily Traffic (AADT) for freeway segments included in the Study Area is presented in Table 3.4-8. Several segments of US 101 operate at level of service F in one or both peak periods. These include the segments of US 101 north of University Avenue; south of University Avenue; and south of Embarcadero/Oregon Expressway. All segments of I-280 operate at LOS D or better under existing conditions. Existing freeway volumes and level of service were obtained from Caltrans, San Mateo County, and Santa Clara County.

<table>
<thead>
<tr>
<th>Freeway Segment</th>
<th>Direction</th>
<th>AADT</th>
<th>LOS (AM)</th>
<th>LOS (PM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 101 North of University</td>
<td>NB SB</td>
<td>192,000</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>US 101 South of University</td>
<td>NB SB</td>
<td>200,000</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>US 101 South of Embarcadero/Oregon Expressway</td>
<td>NB SB</td>
<td>202,000</td>
<td>E D</td>
<td>F</td>
</tr>
<tr>
<td>I-280 north of Sand Hill Road</td>
<td>NB SB</td>
<td>102,000</td>
<td>D D</td>
<td>D</td>
</tr>
<tr>
<td>I-280 south of Alpine Road</td>
<td>NB SB</td>
<td>103,000</td>
<td>C D</td>
<td>C</td>
</tr>
<tr>
<td>I-280 south of Page Mill Road</td>
<td>NB SB</td>
<td>109,000</td>
<td>D C</td>
<td>D</td>
</tr>
</tbody>
</table>

Source: Caltrans 2006 Counts, 2007 San Mateo CMP and 2006 Santa Clara CMP.
Note: Shading indicates freeway segments operating at LOS F.

Existing Bicycle and Pedestrian Facilities

Bicycle travel is an important component of the transportation system connecting Menlo Park, Palo Alto, Stanford University, and Mountain View. In 1972, Palo Alto became one of the first communities in California to establish a dedicated bicycle system. Since then, Menlo Park, Palo Alto, and Stanford University have made progress in developing a system of bicycle and pedestrian routes and facilities to accommodate the growing demand for non-motorized travel.

The existing system consists of three classifications of bicycle facilities:

- Class I Bikeway (Bike Path): A bicycle facility that provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross-flow by motorists minimized.
- Class II Bikeway (Bike Lane): A bicycle facility that provides a striped lane for one-way bicycle travel on a street or highway.
- Class III Bikeway (Bike Route): A bicycle facility that provides for shared use with pedestrian or motor vehicle traffic.

Figure 3.4-2, Figure 3.4-3, and Figure 3.4-4 illustrate the bicycle and pedestrian facilities in the Study Area. There are portions of the Stanford University campus that offer bicycle and pedestrian only access; these facilities are also identified.

Signalized crossings of El Camino Real, which have pedestrian signals to provide safe bicycle and pedestrian crossings, are provided at numerous locations in the Study Area including Ravenswood Avenue, Sand Hill Road, Quarry Road, University Avenue, and Embarcadero Road. Bicycles are legal on all streets in Palo Alto and Menlo Park, except freeways, though there are some major streets with narrow lanes that are not easily shared by bicyclists and motor vehicles.

Both the City of Palo Alto and the City of Menlo Park maintain a system of on- and off-road bicycle lanes, routes and paths. Palo Alto maintains a Bicycle Master Plan and was the first community to develop the bicycle boulevard concept, which is a low-volume through street where bicycles have priority over automobiles. Conflicts between bicycles and automobiles are minimized, and bicycle travel time is reduced by removing stop signs and other impediments to bicycle travel. The bicycle boulevard is located on Bryant Street in Palo Alto. In order to ensure areas of roadways used by bicyclists are maintained at least as well as those used by motorists, the City is adjusting its street evaluation criteria for its Pavement Management Program. In addition, there are several bicycle/pedestrian/transit only routes on the Stanford University campus, such as the Serra Mall. In the City of Menlo Park, a dedicated bicycle path along the south side of the Dumbarton Bridge connects the City with Fremont. The path continues along the south side of Bayfront Expressway to Willow Road which is part of the Study Area. The path runs along the north side of Bayfront Expressway to the Bayfront park entrance at Marsh Road. Nearer to the SUMC Sites, a short Class I bicycle lane and undercrossing extends beneath Alpine Road, adjacent to the Stanford Golf Course which provides an off-street connection to Sand Hill Road.

Pedestrian facilities consist of sidewalks, crosswalks, and many of the facilities for bicycles discussed above. With some exceptions, the regional connections described for bicyclists also exist for pedestrians. For example, pedestrians can use any of the Class I bicycle paths and bridges. Sidewalks are present in most parts of Palo Alto although there are some gaps. There are three pedestrian overcrossings of San Francisquito Creek connecting Menlo Park with Palo Alto: San Mateo Drive, Alma Street, and Willow Place. These facilities provide important off-street connections for both cyclists and pedestrians by avoiding the busy roadway crossings at Middlefield Road and El Camino Real.
FIGURE 3.4-2
Existing Bicycle Facilities in Vicinity of SUMC Sites

FIGURE 3.4-3
Existing Bicycle Facilities in Menlo Park, Near the SUMC Sites

FIGURE 3.4-4
Existing Pedestrian Facilities


Stanford University Medical Center Facilities Renewal and Replacement Project
Stanford University provides a comprehensive bicycle and pedestrian circulation system as an alternative to the automobile. The University has several policies and programs intended to discourage the use of autos and encourage the use of alternative travel modes. These policies include:

- Financial incentives such as commuter cash, VTA Eco-Pass, and Caltrain GO Pass;
- Locating academic and residential land uses in close proximity to one another;
- Application of campus design concepts and site development standards that facilitate bicycle and pedestrian use;
- Maintaining and improving the bicycle and pedestrian connections between residential and employment areas; and
- Providing a safe and easily understood system of pedestrian pathways and bicycleways.

**Existing Transit Service**

The Study Area is currently served by several transit providers, including San Mateo County Transit District (SamTrans), Santa Clara Valley Transportation Authority (VTA), Alameda-Contra Costa Transit District (AC Transit), Stanford University Marguerite shuttle routes, City of Palo Alto shuttle service, City of Menlo Park shuttle service, and Caltrain. Both fixed route bus service and commuter rail service are available within walking distance of the SUMC Sites. Figure 3.4-5 shows the public transit network within the Study Area. The Palo Alto Intermodal Transit Station (PAITS), located near the intersection of El Camino Real and University Avenue, is an intermodal hub served by Santa Clara VTA, SamTrans, Stanford University Marguerite shuttles, AC Transit, and Union City Transit. Other concentrations of bus lines exist at the Stanford Shopping Center, which is located one-quarter of a mile northwest of PAITS.

**Bus Service.** Bus service in the SUMC Sites is provided by SamTrans, Santa Clara VTA, AC Transit, Stanford University, Palo Alto, and Menlo Park.

**SamTrans.** SamTrans currently serves PAITS with local lines 280, 281, express route KX, BART/Caltrain connector routes 297 and 390. Connection to the Stanford Shopping Center is provided by local lines 280, 281 and express RX/PX. Three SamTrans bus layover locations are adjacent to the Stanford Shopping Center.

**Santa Clara VTA.** VTA operates commuter/express and local routes through the Study Area, connecting the City of Palo Alto to other Bay Area cities. VTA serves PAITS with local routes 22 and 35, and the limited-stop Bus Rapid Transit (BRT) route 522. Route 35, in particular, also serves the

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5 The VTA Eco-Pass under SUMC’s current TDM program allows unlimited travel on VTA buses (including express services), VTA light rail, Dumbarton Express, Highway 17 Express, and Monterey-San Jose Express.

6 The Caltrain GO Pass is an employer-sponsored annual pass that offers unlimited rides on Caltrain through all Caltrain zones, seven days a week, for one annual cost. Source: http://www.caltrain.com/caltrain_GO_Pass.html, accessed March 16, 2010.
FIGURE 3.4-5
Existing Transit Route Network

Stanford Shopping Center. VTA local route 89 provides service between the Palo Alto Veteran’s Hospital and the California Avenue Caltrain station.

**AC Transit.** AC Transit operates the Dumbarton Express, which provides service from the Union City BART station to Palo Alto utilizing the Dumbarton Toll Bridge. It also serves the California Avenue Caltrain Station, North Santa Clara County Offices, the Santa Clara County Municipal Court, and the Stanford Research Park. AC Transit also operates the Stanford U Line bus service from the East Bay and Stanford provides funding for this service. The U Line serves the SUMC.

**Stanford University Marguerite Shuttle.** Stanford University operates the Marguerite Shuttle, which provides free service to many locations on the main campus and Palo Alto, such as the Medical Center, Stanford Shopping Center, Stanford Linear Accelerator (SLAC), PAITS, California Avenue Caltrain Station and downtown Palo Alto. All of the shuttle lines, except for the Downtown Express are wheelchair accessible. The shuttle operates weekdays from 6:00 a.m. to 8:00 p.m., except during University holidays. Marguerite's A and B lines meet most trains at the PAITS weekdays from 6:00 a.m. to 8:30 p.m. to serve commuters.

Line A connects Escondido Village and Rains student housing to the main campus and Medical Center.

Line B serves Rains and the East Residences, as well as several central campus locations such as Tresidder Memorial Union, Terman Engineering Center, and the Law School. It runs to and from the PAITS by way of Town and Country Village, thereby serving shoppers throughout the day.

Line C serves the California Avenue Caltrain Station, the main campus, Medical Center and the Stanford West Apartments.

The Stanford Linear Accelerator Center (SLAC) shuttle operates Monday through Friday year round (except on campus holidays) between SLAC and Hoover Tower by way of the Oak Creek Apartments located on Sand Hill Road, West Campus Residences, and the Science and Engineering Quad. Service is provided every 20 minutes between 7:30 a.m. to 9:00 p.m.

The SLAC Employee Shuttle operates weekday mornings 6:27 a.m. to 8:15 a.m. and weekday evenings 3:10 p.m. to 5:05 p.m., year round (except campus holidays). Stops include the Stanford West Apartments, PAITS, SLAC Fire Station, Computer Building, and SSRL Gate 17 and the new Rosewood Hotel and office complex.

The Midnight Express is an evening and weekend service that operates from September through June, linking the campus to the Palo Alto Caltrain Station. Shuttle frequency is every 15 to 30 minutes.

The Shopping Express operates daily during the academic year from September through June, linking the SUMC and residential areas of Stanford University to the business districts in Palo Alto (downtown, California Avenue, and Town & Country Village) and Mountain View (San Antonio Shopping Center).
City of Palo Alto Shuttle. The City operates two shuttle routes: the Crosstown Shuttle and the Embarcadero Shuttle. On weekdays, both routes serve the University Avenue Caltrain Station and Palo Alto Transit Center. The Palo Alto Shuttle is free and open to the general public. Bus stops are marked with a "Palo Alto Shuttle" sign, a sticker on a regular VTA bus stop sign, or a shuttle decal on a stop sign pole.

- The Crosstown Shuttle runs every half-hour from 7:00 a.m. to 6:00 p.m. It connects residential neighborhoods, senior residences and services, libraries, recreation centers, commercial districts.
- The Embarcadero Shuttle runs during the morning, noon and evening commute hours at 15-minute intervals. It is coordinated with the Caltrain schedule, serving employers in the East Bayshore area, residents in the Embarcadero Road corridor and students at Palo Alto High School.

City of Menlo Park Midday Shuttle Service. The Midday Shuttle Service is a free community service route open to the general public. It is especially popular with senior citizens. Its key stops include the Menlo Park Library, Belle Haven Library, Menlo Park Senior Center, downtown Menlo Park, Menlo Park Caltrain station, Menlo Medical Clinic, Stanford Shopping Center and SUMC. Hourly service is provided Monday through Friday between 9:30 a.m. and 3:30 p.m. This service is funded by the City of Menlo Park and the Bay Area Air Quality Management District (BAAQMD) Transportation Fund for Clean Air.

Commuter Rail Service. The Peninsula Corridor Joint Powers Board (JPB) rail service, Caltrain, runs along the Peninsula, from San Francisco in the north to San Jose and Gilroy in the south. Caltrain is managed by SamTrans, and operates under the jurisdiction of the JPB. The travel time between San Jose and San Francisco is approximately one hour and 20 minutes.

There are two Caltrain stations serving the Stanford University area, at the Palo Alto Transit Center (east of El Camino Real at University Avenue) and at California Avenue. On weekdays, trains run every 5 to 30 minutes during the morning and afternoon commute hours and hourly during off-peak times. Hours of operation are from 5:01 a.m. to 11:04 p.m. for northbound service and from 5:51 a.m. to 12:57 a.m. for southbound service. Service is also provided on Saturdays. The hours of operation are from 7:31 a.m. to 11:01 p.m. for northbound trains, and from 9:02 a.m. to 1:03 a.m. for southbound trains.

Caltrain’s Baby Bullet Express skips several of the stops, such as California Avenue, and is able to travel between San Francisco and San Jose in under an hour. Twenty two train trips are provided during AM and PM Peak Hours.
Existing Parking

A survey\(^7\) of parking conditions at the Stanford University Medical Center was conducted in October of 2008. The survey was conducted during the mid-morning and mid-afternoon time periods. The following are the results of the survey:

- SUMC (including both hospitals and medical offices) currently has approximately 8,900 parking spaces available.
- 190 of the spaces are “on-street” parking spaces.
- Approximately 625 of the spaces are dedicated to the three medical office buildings at 703, 900, and 1101 Welch Road.
- Some of these parking spaces are located in areas and parking structures that serve both SUMC and Stanford University.
- During the survey, about 6,400 spaces were occupied during both the mid-morning and mid-afternoon time periods. Of these, about 4,200 (65 percent) belong to hospital employees and visitors. The survey also noted that the mid-morning period has a higher parking demand compared to the mid-afternoon period. The demand at the dedicated medical office parking area is between 70 percent and 80 percent during the mid-morning peak.

Transportation Demand Management

Transportation demand management (TDM) refers to policies and programs that are designed to reduce the number of vehicle trips that are made, especially during the peak time periods of the day when congestion on roadways is at its worst. It refers to a wide array of measures, from telecommuting programs that allow employees to work from home; to carpool and vanpool programs that encourage two or more people to share their commute to work; to incentives to encourage people to leave their cars at home and instead use public transit, or bicycle or walk to work.

Although a State law was passed in 1995 that prohibits public agencies from requiring mandatory TDM, SHC, LPCH, and the SoM still voluntarily provide TDM programs for their employees. Furthermore, the City has concluded that, notwithstanding this State law, the City nonetheless can effectively require the applicant to include TDM measures in the SUMC Project. Key components of the current TDM program administered by SHC, LPCH, and the SoM are summarized below. The program is designed to reduce “drive-alone” trips by encouraging the use of public transit, walking, and bicycling.

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\(^7\) Fehr and Peers, Stanford University Medical Center Trip Generation and Parking Demand Study, October 2008.
Commute Club: Incentives or perks for those who choose not to drive to work, e.g.:
- Up to $282/ year in Clean Air Cash or Carpool Credit
- Complimentary daily parking passes for carpoolers
- Online Stanford ride-matching service
- Commuter Buddy Program
- Pretax payroll deduction for transit passes, Caltrain parking and commuter checks
- Rewards for recruiting new members
- Guaranteed ride home
- 12 free hourly car rental vouchers
- Membership appreciate events
- Entries into regular prize drawings
- Ability to purchase up to eight daily parking permits per month and have them mailed home
- Reserved parking spaces for all carpools/vanpools
- Vanpool subsidies
- Members-only commuter gifts

Marguerite Shuttle: Free, comprehensive campus shuttle system, open to the public that connects with local transit and Caltrain. New buses run on biodiesel fuel and real-time schedules can be viewed on the web under the Automated Transportation Management System.

VTA Eco-Pass: Free to eligible hospital employees, allows unlimited travel on VTA buses (including express services), VTA light rail, Dumbarton Express, Highway 17 Express and Monterey-San Jose Express.

Line U Stanford Express: Free use of East Bay express bus that connects BART, ACE train and remote park and ride lots (e.g. Ardenwood Farms) to Stanford.

Bicycle Program: Programs that promote and encourage the safe use of bicycles in and around the campus e.g. bicycle light giveaways, safety education programs, bicycle safety road show, commute planning/cycling information.

Vehicle Rental: Hourly, half-day and full-day car rental (through on-campus Enterprise Rent-a-Car office) available to faculty, staff and students 18 years and older.

Charter Bus Services: Group transportation services are provided during events like conferences or student activities to allow for alternative forms of commuting.

Others: Flexible work options (staggered work hours, compressed work week etc.), alternative transportation promotional events, one-on-one commute planning assistance, etc.

**Applicable Plans and Policies**

There are no relevant federal or State transportation policies applicable to the implementation of the SUMC Project. Relevant policies in the City’s Comprehensive Plan have been listed and analyzed for consistency with the SUMC Project in Section 3.2, Land Use.
City of Palo Alto Municipal Code. The City of Palo Alto’s basic parking regulations are described in Title 18 of the Municipal Code.\textsuperscript{8}

- **Parking Required.** Off-street parking, loading, and bicycle facilities shall be provided for any new building constructed and for any new use established, for any addition or enlargement of an existing building or use, and for any change in the occupancy of any building or the manner in which any use is conducted that would result in additional spaces being required, subject to the provisions of this chapter.

- **Parking Requirements.** In each district, off-street parking, loading, and bicycle facilities for each use shall be provided in accordance with Table 3.4-9 and Table 3.4-10. The requirement for any use not specifically listed shall be determined by the director on the basis of requirements for similar uses, and on the basis of evidence of actual demand created by similar uses in Palo Alto and elsewhere, and such other traffic engineering or planning data as may be available and appropriate to the establishment of a minimum requirement.

\begin{table}[h]
\centering
\caption{Minimum Off-Street Parking Requirements}
\begin{tabular}{ |c|c|c|c|}
\hline
\textbf{Use} & \textbf{Vehicle Parking Requirement} & \textbf{Bicycle Parking Requirement} & \textbf{Long Term (LT) and Short Term (ST)} \\
\hline
Hospitals & 1 space for each 1.5 patient beds & 1 per 15 patient beds & 60\% \textsuperscript{LT} \\
Medical Offices & 1 per 250 sq. ft. of gross floor area & 1 per 2,500 s f & 40\% \textsuperscript{ST} \\
\hline
\end{tabular}
\end{table}


\begin{table}[h]
\centering
\caption{Minimum Off-Street Loading Requirements}
\begin{tabular}{ |c|c|c|}
\hline
\textbf{Use} & \textbf{Gross Floor Area} & \textbf{Loading Spaces Required} \\
\hline
Hospitals & 200,000 sq. ft. or greater & 3 \\
Medical Offices & 10,000 – 99,999 sq. ft. & 1 \\
& 100,000 – 199,999 sq. ft. & 2 \\
\hline
\end{tabular}
\end{table}


\textsuperscript{8} City of Palo Alto. Zoning Code Chapter 18.52: Parking and Loading Requirements. \url{http://www.cityofpaloalto.org/depts/pln/planning_forms.asp#Zoning%20Code}. 
• **Adjustments by the Director.** Automobile parking requirements may be adjusted by the Director of Planning and Community Environment in the following instances and in accord with the prescribed limitations in Table 3.4-11, when in his/her opinion such adjustment will be consistent with the purposes of this chapter, will not create undue impact on existing or potential uses adjoining the site or in the general vicinity, and will be commensurate with the reduced parking demand created by the development, including for visitors and accessory facilities where appropriate. No reductions may be granted that would result in provision of less than ten (10) spaces on a site. The following are adjustments that apply to developments not located within a parking assessment district. Adjustments within the parking assessment districts are contained in Section 18.52.080. The decision regarding parking adjustments may be appealed as set forth in Chapter 18.78 (Appeals).

### Table 3.4-11
**Allowable Parking Adjustments**

<table>
<thead>
<tr>
<th>Purpose of Adjustment</th>
<th>Amount of Adjustment</th>
<th>Maximum Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation and Parking Alternatives</td>
<td>Where effective alternatives to automobile access are provided, other than those listed above, parking requirements may be reduced to an extent commensurate with the permanence, effectiveness, and the demonstrated reduction of off-street parking demand effectuated by such alternative programs. Examples of such programs may include, but are not limited to, transportation demand management (TDM) programs or innovative parking pricing or design solutions.</td>
<td>20 percent of the total spaces required for the site</td>
</tr>
</tbody>
</table>

*Source: City of Palo Alto Municipal Code.*

### Impacts and Mitigation Measures

#### Standards of Significance

The Study Area encompasses parts of the Cities of Palo Alto, Menlo Park, and East Palo Alto, as well as unincorporated parts of Santa Clara County. Significance criteria for project impacts vary by jurisdiction. For the purposes of this analysis, impacts were determined based on the criteria of the jurisdiction in which the intersection or roadway segment is located, e.g., an intersection located in the City of Palo Alto was evaluated based on City of Palo Alto significance criteria. Additionally:

- City of Palo Alto criteria have been applied for intersections under Santa Clara County and Stanford University control, as Palo Alto’s criteria are more stringent.
- City of Menlo Park criteria have been applied for collector and minor arterial roadway segments in Menlo Park.
- Residential roads in Palo Alto and Menlo Park identified for this study have been analyzed using the TIRE Index methodology.
• City of East Palo Alto criteria have been applied for intersections within that jurisdiction.

**City of Palo Alto Standards of Significance.** Traffic impacts would be considered significant if the SUMC Project would:

• Cause a local (City of Palo Alto) intersection to deteriorate below LOS D;
• Causes a local intersection already operating at LOS E or F to deteriorate in the average control delay for the critical movements by four seconds or more, and the critical V/C ratio value to increase by 0.01 or more;
• Cause a regional intersection to deteriorate from LOS E or better to LOS F;
• Cause a regional intersection already operating at LOS F to deteriorate in the average control delay for the critical movements to increase by four seconds or more, and the critical V/C to increase by 0.01 or more;
• Result in increased traffic volumes at an unsignalized intersection, and meet traffic signal warrants;
• Cause queuing impacts based on a comparison of the demand queue length and the available queue storage capacity for intersections and access points in the immediate vicinity of the project;
• Cause a freeway segment (for each direction of traffic) to operate at LOS F, or contribute traffic in excess of 1 percent of segment capacity to a freeway segment already operating at LOS F;
• Result in increased traffic related hazards to pedestrians and bicyclists as a result of increased congestion;
• Impede the operation of a transit system as a result of a significant increase in ridership;
• Result in inadequate on-site parking supply;
• Create an operational safety hazard;
• Result in inadequate emergency access; or
• Cause any change in traffic that would increase the TIRE index by 0.1 or more on a local or collector residential street.

**City of Menlo Park Standards of Significance.** The City of Menlo Park considers a project to have a significant impact if it would:

• Cause an intersection on a collector street to operate at LOS D or below or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first;
• Cause an intersection on an arterial street or a local approaches to a State controlled signalized intersection to operate at LOS E or below or have an increase of 23 seconds or greater in average delay, whichever comes first;
• Cause an increase of more than 0.8 seconds of average delay to vehicles on all critical movements for intersection on collector streets operating at LOS D or below or LOS E or below for arterial streets;

• Cause an increase of 0.8 seconds or more of delay to vehicles on any critical movement for intersections on local approaches to State controlled signalized intersections operating at LOS E or below;

• Cause the following impacts on minor arterial streets. If the existing ADT is:
  1) greater than 18,000 (90 percent of capacity), and there is a net increase of 100 trips or more in ADT due to project traffic;
  2) the ADT is greater than 10,000 (50 percent of capacity) but less than 18,000, and the project traffic increases the ADT by 12.5 percent or the ADT becomes 18,000 or more;
  3) the ADT is less than 10,000, and the project traffic increases the ADT by 25 percent;

• Cause the following impacts on collector streets. If the existing ADT is:
  1) greater than 9,000 (90 percent of capacity), and there is a net increase of 50 trips or more in ADT due to project traffic;
  2) the ADT is greater than 5,000 (50 percent of capacity) but less than 9,000 and the project traffic increases the ADT by 12.5 percent or the ADT becomes 9,000 or more;
  3) the ADT is less than 5,000 and the project traffic increases the ADT by 25 percent;

• Cause the following impacts on local streets. If the existing ADT is:
  1) greater than 1,350 (90 percent of capacity), and there is a net increase of 25 trips or more in ADT due to project traffic;
  2) the ADT is greater than 750 (50 percent of capacity) but less than 1,350, and the project traffic increases the ADT by 12.5 percent or the ADT becomes 1,350; or
  3) the ADT is less than 750 and the project traffic increases the ADT by 25 percent.

City of East Palo Alto Standards of Significance. The City of East Palo Alto considers a project to have a significant impact if it would:

• Cause an intersection’s operation to deteriorate from an acceptable level (LOS D or better) under background conditions to an unacceptable level (LOS E or LOS F);

• Exacerbate unacceptable operations (LOS E or F) at a signalized intersection by increasing the critical delay by more than four seconds and increasing the V/C ratio by 0.01 or more; or

• Exacerbate the V/C ratio by 0.01 or more at a signalized intersection observed to operate at unacceptable operations, even if the calculated level of service is acceptable.
Future Conditions

This section describes the future year scenarios and how they were analyzed. Although construction of the SUMC Project would be completed by 2021, the SUMC Project would not be fully operational until 2025. Therefore, the traffic impacts that would result from implementation of the SUMC Project were only estimated for post-construction (2025) conditions. The cumulative horizon is also 2025, the same as the project horizon. Therefore, the 2025 with project scenario and the cumulative scenario are one and the same.

Whereas the analysis of the existing traffic conditions is based on existing (2007, 2008, and 2009) traffic count data, the future year analysis is based on traffic forecasts that were developed using the City of Palo Alto Travel Demand Forecasting Model. The key inputs to the model are the estimated growth in commercial and residential development, and the planned and programmed infrastructure improvements (roads, public transit, bicycle, and pedestrian facilities) that would occur between the existing and future years. Based on these assumptions, the model forecasts the amount of vehicular traffic that would use each of the roadway segments, freeway segments, and intersections; the number of passengers that would use the public transit routes; and the number of bicyclists and pedestrians that would use the trails and paths that have been analyzed as part of the Transportation Impact Analysis.

2025 No Project. This scenario includes all of the growth in population and employment that is projected to occur between Existing Conditions and the year 2025. It also includes all of the highway and transit improvements that have dedicated sources of funding that are scheduled to be completed between Existing Conditions and 2025. It does not include the SUMC Project.

Level of Service for Intersections. The future conditions intersection analysis was performed using the same methods as were used to analyze Existing Conditions. The future Peak Hour traffic volumes were used with the future lane configurations and signal phasing (for signalized intersections) as inputs into the LOS calculations to evaluate future operations. Future year intersection lane geometry, traffic control, and turning movement volumes for each of the analyzed intersections, for each analyzed scenario are shown in Appendix C.

The results for 2025 No Project conditions are presented in Table 3.4-12. During the AM Peak Hour, the following 11 intersections would operate at unsatisfactory levels of service. Of these 11 intersections, six would operate at LOS E and five would operate at LOS F in the AM Peak Hour.

- El Camino Real/University Avenue-Palm Drive (LOS E) [intersection #10]
- El Camino Real/Page Mill Road – Oregon Expressway (LOS E) [intersection #16]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road (LOS F) [intersection #23]
- Arboretum Road/Galvez Street (LOS E) [intersection #37]
- Alma Street/Charleston Road (LOS E) [intersection #39]
During the PM Peak Hour, 15 intersections would operate at unsatisfactory levels of service. Of these 15 intersections, seven would operate at LOS E and eight would operate at LOS F during the PM Peak Hour.

- El Camino Real/Ravenswood Avenue (LOS E) [intersection #3]
- El Camino Real/Embarcadero Road – Galvez Street (LOS E) [intersection #11]
- El Camino Real/Page Mill Road – Oregon Expressway (LOS E) [intersection #16]
- Middlefield Road/Willow Road (LOS E) [intersection #18]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road (LOS F) [intersection #23]
- Junipero Serra Boulevard/Campus Drive West (LOS E) [intersection #26]
- Arboretum Road/Galvez Street (LOS F) [intersection #37]
- El Camino Real/Charleston Road (LOS E) [intersection #38]
- Alma Street/Charleston Road (LOS E) [intersection #39]
- Bayfront Expressway/Willow Road (LOS F) [intersection #52]
- Bayfront Expressway/University Avenue (LOS F) [intersection #53]
- Bay Road/University Avenue (LOS F) [intersection #54]
- Alpine Road/I-280 northbound off-ramp (LOS F) [intersection #62]
- Page Mill Road/I-280 southbound off-ramp (LOS F) [intersection #65]
- Foothill Expressway/Arastradero Road (LOS F) [intersection #66]
<table>
<thead>
<tr>
<th>Intersection</th>
<th>LOS</th>
<th>Avg Del (sec)</th>
<th>Crit V/C</th>
<th>Avg Crit Del (sec)</th>
<th>LOS</th>
<th>Avg Del (sec)</th>
<th>Crit V/C</th>
<th>Avg Crit Del (sec)</th>
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<td>El Camino Real/Valparaiso Avenue</td>
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<td>0.912</td>
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<td>El Camino Real/Santa Cruz Avenue</td>
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<td>0.614</td>
<td>21.6</td>
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<tr>
<td>El Camino Real/Ravenswood Avenue</td>
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<td>46.5</td>
<td>0.902</td>
<td>51.6</td>
<td>E+</td>
<td>58.9</td>
<td>0.962</td>
<td>76.8</td>
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<td>9</td>
<td>B</td>
<td>12.6</td>
<td>0.528</td>
<td>11.3</td>
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<td>D</td>
<td>41.6</td>
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<td>D+</td>
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<td>D-</td>
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<td>C</td>
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<td>24.5</td>
<td>C</td>
<td>26.5</td>
<td>0.727</td>
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<td>El Camino Real/Stanford Avenue</td>
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<td>17.9</td>
<td>C</td>
<td>27.7</td>
<td>0.733</td>
<td>33</td>
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<td>El Camino Real/California Avenue</td>
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<td>0.698</td>
<td>28</td>
<td>C</td>
<td>28.1</td>
<td>0.756</td>
<td>29.7</td>
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<td>El Camino Real/Page Mill Road-Oregon Expressway</td>
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<td>Woodland Avenue/University Avenue</td>
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<td>41.4</td>
<td>D-</td>
<td>51.6</td>
<td>0.962</td>
<td>66.7</td>
</tr>
<tr>
<td>Middlefield Road/Willow Road</td>
<td>D+</td>
<td>36.4</td>
<td>0.657</td>
<td>40.3</td>
<td>E</td>
<td>60.1</td>
<td>0.922</td>
<td>67.6</td>
</tr>
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<td>Middlefield Road/Lytton Avenue</td>
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<td>41.7</td>
<td>0.874</td>
<td>44.8</td>
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<td>54.5</td>
<td>0.955</td>
<td>60.1</td>
</tr>
<tr>
<td>Middlefield Road/University Avenue</td>
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<td>28.7</td>
<td>0.608</td>
<td>31</td>
<td>C-</td>
<td>33.3</td>
<td>0.815</td>
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</tr>
<tr>
<td>Middlefield Road/Embarcadero Road</td>
<td>D</td>
<td>41.3</td>
<td>0.666</td>
<td>43.4</td>
<td>D+</td>
<td>38.8</td>
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<tr>
<td>Alma Street/Churchill Avenue</td>
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<td>D+</td>
<td>36</td>
<td>0.93</td>
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</table>
## Table 3.4-12
### LOS of Study Intersections for 2025 No Project

<table>
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<tr>
<th>Intersection</th>
<th>2025 AM</th>
<th>2025 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOS</td>
<td>Avg Del (sec)</td>
</tr>
<tr>
<td>#23 Junipero Serra Boulevard-Foothill Expressway/Page Mill Road</td>
<td>F</td>
<td>126</td>
</tr>
<tr>
<td>#24 Junipero Serra Boulevard/Stanford Avenue</td>
<td>B</td>
<td>14.2</td>
</tr>
<tr>
<td>#25 Junipero Serra Boulevard/Campus Drive East</td>
<td>B</td>
<td>14</td>
</tr>
<tr>
<td>#26 Junipero Serra Boulevard/Campus Drive West</td>
<td>D</td>
<td>50.8</td>
</tr>
<tr>
<td>#27 Junipero Serra Boulevard/Alpine Road-Santa Cruz Avenue</td>
<td>D+</td>
<td>36.6</td>
</tr>
<tr>
<td>#28 Sand Hill Cir- I-280/Sand Hill Road</td>
<td>D+</td>
<td>36.9</td>
</tr>
<tr>
<td>#29 Sharon Park Drive/Sand Hill Road</td>
<td>C</td>
<td>30.7</td>
</tr>
<tr>
<td>#30 Santa Cruz Avenue/Sand Hill Road</td>
<td>D+</td>
<td>52.5</td>
</tr>
<tr>
<td>#31 Oak Avenue/Sand Hill Road -Vine Street</td>
<td>A</td>
<td>9</td>
</tr>
<tr>
<td>#32 Stock Farm Road/Sand Hill Road</td>
<td>B-</td>
<td>17</td>
</tr>
<tr>
<td>#33 Pasteur Drive/Sand Hill Road</td>
<td>B+</td>
<td>18.5</td>
</tr>
<tr>
<td>#34 Arboretum Road/Sand Hill Road</td>
<td>C+</td>
<td>20.5</td>
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<tr>
<td>#35 Arboretum Road/Quarry Road</td>
<td>C</td>
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<tr>
<td>#37 Arboretum Road/Galvez Street/(unsignalized)</td>
<td>E</td>
<td>38.8</td>
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<td>D+</td>
<td>53.1</td>
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<td>#40 Middlefield Road/Charleston Road</td>
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</tr>
<tr>
<td>#43 University Drive/Santa Cruz Avenue</td>
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<tr>
<td>#44 El Camino Real/Oak Grove Avenue</td>
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<td>#45 Middlefield Road/Ringwood Avenue</td>
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Table 3.4-12
LOS of Study Intersections for 2025 No Project

<table>
<thead>
<tr>
<th>Intersection</th>
<th>2025 AM</th>
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<th>2025 PM</th>
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<tr>
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<td>#48 Bay Road/Marsh Road</td>
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</tr>
<tr>
<td>#53 University Avenue/Bayfront Expressway</td>
<td>D</td>
<td>43.5</td>
<td>1.057</td>
<td>86.8</td>
<td>F</td>
<td>104.6</td>
<td>1.167</td>
<td>120.8</td>
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</tr>
<tr>
<td>#54 Bay Road/University Avenue</td>
<td>D+</td>
<td>38.8</td>
<td>0.836</td>
<td>43.7</td>
<td>F</td>
<td>96.1</td>
<td>1.166</td>
<td>129.2</td>
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<tr>
<td>#55 Donohoe Street/University Avenue</td>
<td>E</td>
<td>73.9</td>
<td>1.018</td>
<td>81.6</td>
<td>D</td>
<td>43</td>
<td>0.899</td>
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</tr>
<tr>
<td>#56 Welch Road/Quarry Road</td>
<td>C+</td>
<td>20.9</td>
<td>0.558</td>
<td>24.1</td>
<td>C+</td>
<td>21.4</td>
<td>0.541</td>
<td>23.1</td>
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</tr>
<tr>
<td>#57 Durand Way/Sand Hill Road</td>
<td>B</td>
<td>12.1</td>
<td>0.662</td>
<td>10.4</td>
<td>B-</td>
<td>19.5</td>
<td>0.617</td>
<td>19.4</td>
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</tr>
<tr>
<td>#58 Pasteur Drive NB/Welch Road</td>
<td>A</td>
<td>8.8</td>
<td>0.354</td>
<td>10.3</td>
<td>B+</td>
<td>10.5</td>
<td>0.433</td>
<td>10.9</td>
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</tr>
<tr>
<td>#59 Pasteur Drive SB/Welch Road</td>
<td>B+</td>
<td>10.1</td>
<td>0.31</td>
<td>10.1</td>
<td>A</td>
<td>8.5</td>
<td>0.272</td>
<td>9</td>
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<tr>
<td>#60 Durand Way Extension/Welch Road</td>
<td>C-</td>
<td>32.5</td>
<td>0.732</td>
<td>37.9</td>
<td>C</td>
<td>26.8</td>
<td>0.631</td>
<td>26.4</td>
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</tr>
<tr>
<td>#61 Bowdoin Street/Stanford Road/(unsignalized)</td>
<td>C</td>
<td>23.5</td>
<td>0.887</td>
<td>23.5</td>
<td>D</td>
<td>31.4</td>
<td>0.921</td>
<td>31.4</td>
<td></td>
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</tr>
<tr>
<td>#62 Alpine Road/I-280 NB Off-Ramp (unsignalized)</td>
<td>F</td>
<td>323.6</td>
<td>2.474</td>
<td>323.6</td>
<td>F</td>
<td>205.7</td>
<td>1.789</td>
<td>205.7</td>
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</tr>
<tr>
<td>#63 Alpine Road/I-280 SB Off-Ramp (unsignalized)</td>
<td>F</td>
<td>273.7</td>
<td>1.705</td>
<td>273.7</td>
<td>C</td>
<td>24.7</td>
<td>0.558</td>
<td>24.7</td>
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</tr>
<tr>
<td>#64 Page Mill Road/I-280 NB Off-Ramp (unsignalized)</td>
<td>E</td>
<td>44.6</td>
<td>0.632</td>
<td>44.6</td>
<td>C</td>
<td>16.1</td>
<td>0.276</td>
<td>16.1</td>
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</tr>
<tr>
<td>#65 Page Mill Road/I-280 SB Off-Ramp</td>
<td>F</td>
<td>122.6</td>
<td>1.386</td>
<td>122.6</td>
<td>F</td>
<td>100.9</td>
<td>1.497</td>
<td>100.9</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>#66 Foothill Expressway/Arastradero Road</td>
<td>F</td>
<td>105.8</td>
<td>0.743</td>
<td>185</td>
<td>F</td>
<td>97</td>
<td>0.811</td>
<td>140</td>
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</tr>
</tbody>
</table>


Note: Shading indicates intersections operating at LOS E or F.
Level of Service for Roadway Segments. The TIRE index was used to evaluate operating conditions for the residential streets in the City of Palo Alto and Menlo Park. Table 3.4-13 shows the results for these residential streets for the 2025 No Project scenario. Segments of Santa Cruz Avenue and Sharon Road in Menlo Park have a TIRE index above 3. Hawthorne Avenue, Everett Avenue, and Hamilton Avenue in Palo Alto have a TIRE index above 3. However, per the CEQA standards of significance of Menlo Park, impacts on Menlo Park roadways are based on ADT rather than the TIRE index.

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Segment</th>
<th>City</th>
<th>ADT</th>
<th>TIRE Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Cruz Avenue</td>
<td>N of Sand Hill Road</td>
<td>MP</td>
<td>25,747</td>
<td>4.4</td>
</tr>
<tr>
<td>Sharon Road</td>
<td>N of Sharon Park Drive</td>
<td>MP</td>
<td>4,774</td>
<td>3.7</td>
</tr>
<tr>
<td>Stanford Avenue</td>
<td>N of Sand Hill Road</td>
<td>MP</td>
<td>186</td>
<td>2.3</td>
</tr>
<tr>
<td>Leland Avenue</td>
<td>N of Sand Hill Road</td>
<td>MP</td>
<td>337</td>
<td>2.5</td>
</tr>
<tr>
<td>Vine Street</td>
<td>N of Sand Hill Road</td>
<td>MP</td>
<td>429</td>
<td>2.6</td>
</tr>
<tr>
<td>Hawthorne Avenue</td>
<td>East of Alma Street</td>
<td>PA</td>
<td>2,193</td>
<td>3.3</td>
</tr>
<tr>
<td>Everett Avenue</td>
<td>East of Alma Street</td>
<td>PA</td>
<td>1,759</td>
<td>3.2</td>
</tr>
<tr>
<td>Hamilton Avenue</td>
<td>Between Chaucer Street and Lincoln Avenue</td>
<td>PA</td>
<td>3,121</td>
<td>3.5</td>
</tr>
</tbody>
</table>


Note: Shaded rows indicate TIRE Index greater than 3.0, which is traffic dominated.

Several larger roadways (minor arterials and collectors) located in the City of Menlo Park were evaluated for SUMC Project impacts, based on ADT. Table 3.4-14 shows the ADT for the identified collectors and minor arterials for the 2025 No Project scenario.

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Type</th>
<th>Segment</th>
<th>No Build</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsh Road</td>
<td>Minor Arterial</td>
<td>W of US 101</td>
<td>39,454</td>
</tr>
<tr>
<td>Sand Hill Road</td>
<td>Minor Arterial</td>
<td>E of Santa Cruz Avenue</td>
<td>33,407</td>
</tr>
<tr>
<td>Willow Road</td>
<td>Minor Arterial Collector</td>
<td>E of Middlefield Road</td>
<td>23,823</td>
</tr>
<tr>
<td>Alpine Road</td>
<td>Minor Arterial</td>
<td>W of Junipero Serra Boulevard</td>
<td>25,120</td>
</tr>
<tr>
<td>Middlefield Road</td>
<td>Minor Arterial</td>
<td>N of Ravenswood Avenue</td>
<td>14,359</td>
</tr>
<tr>
<td>Ravenswood Avenue</td>
<td>Minor Arterial</td>
<td>E of El Camino Real</td>
<td>22,705</td>
</tr>
<tr>
<td>Santa Cruz Avenue</td>
<td>Minor Arterial</td>
<td>W of El Camino Real</td>
<td>6,530</td>
</tr>
<tr>
<td>Valparaiso Avenue</td>
<td>Minor Arterial</td>
<td>W of El Camino Real</td>
<td>16,239</td>
</tr>
</tbody>
</table>

Level of Service for Freeways. Table 3.4-15 presents the 2025 No Project freeway volumes. Future volumes were obtained from the Palo Alto Citywide Travel Demand Model used throughout the Transportation Impact Analysis. The free-flow speed on the freeway is assumed to be the speed limit of 65 mph. By 2025, the operations of US 101 are expected to deteriorate to LOS F during both the AM and PM Peak Hours. Two segments of I-280 are expected to operate at LOS F in the AM Peak Hour, while all segments are expected to operate in the LOS D and E range during the PM Peak Hour.

Table 3.4-15
2025 No Project Freeway Level of Service

<table>
<thead>
<tr>
<th>Direction</th>
<th>No. of Mixed Lanes</th>
<th>Peak Period</th>
<th>Volume (pc/hr)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US 101 Segment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1  University Avenue to Willow Road</td>
<td>NB</td>
<td>AM</td>
<td>6660</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>6000</td>
<td>F</td>
</tr>
<tr>
<td>2  University Avenue to Willow Road</td>
<td>SB</td>
<td>AM</td>
<td>5580</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>4530</td>
<td>F</td>
</tr>
<tr>
<td>3  University Avenue to Embarcadero /Oregon Expressway</td>
<td>NB</td>
<td>AM</td>
<td>5910</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>5540</td>
<td>F</td>
</tr>
<tr>
<td>4  University Avenue to Embarcadero /Oregon Expressway</td>
<td>SB</td>
<td>AM</td>
<td>5170</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>4210</td>
<td>F</td>
</tr>
<tr>
<td>5  Embarcadero/Oregon Expressway to San Antonio Road</td>
<td>NB</td>
<td>AM</td>
<td>7610</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>6030</td>
<td>F</td>
</tr>
<tr>
<td>6  Embarcadero/Oregon Expressway to San Antonio Road</td>
<td>SB</td>
<td>AM</td>
<td>6510</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>5720</td>
<td>F</td>
</tr>
<tr>
<td><strong>I-280 Segment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1  Sand Hill Road to Woodside Road</td>
<td>NB</td>
<td>AM</td>
<td>6310</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>8790</td>
<td>E</td>
</tr>
<tr>
<td>2  Sand Hill Road to Woodside Road</td>
<td>SB</td>
<td>AM</td>
<td>9430</td>
<td>F</td>
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<tr>
<td></td>
<td></td>
<td>PM</td>
<td>6210</td>
<td>D</td>
</tr>
<tr>
<td>3  Alpine Road to Page Mill Road</td>
<td>NB</td>
<td>AM</td>
<td>7350</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>8220</td>
<td>D</td>
</tr>
<tr>
<td>4  Alpine Road to Page Mill Road</td>
<td>SB</td>
<td>AM</td>
<td>8920</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>7030</td>
<td>D</td>
</tr>
<tr>
<td>5  Page Mill Road to El Monte Avenue</td>
<td>NB</td>
<td>AM</td>
<td>9660</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>7450</td>
<td>D</td>
</tr>
<tr>
<td>6  Page Mill Road to El Monte Avenue</td>
<td>SB</td>
<td>AM</td>
<td>7100</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>8480</td>
<td>E</td>
</tr>
</tbody>
</table>


Notes:
HOV lane not included.
Shading indicates freeway segment operating at LOS F.
Environmental Analysis

TR-I. Construction Impacts. Construction activity associated with the SUMC Project could result in significant traffic impacts. (S)

Project-related construction traffic could contribute to increased intersection delays and interference with pedestrians, bicyclists, and public transit. Also, construction traffic may create an operational hazard or result in inadequate emergency access. These impacts would be significant, although would be limited to the construction phase of the SUMC Project. During the construction period, impacts might arise from a substantial increase in heavy truck travel, as materials are brought in to the SUMC Sites, and demolished or excavated materials are hauled out. Temporary lane or road closures might be required for construction and for underground utility work. Construction activities would lead to both temporary disruption of transportation system operations and possible damage to elements of the roadway system such as pavement and bridges.

Figure 3.4-6 illustrates the proposed truck routes in the near vicinity of the SUMC Sites and Figure 3.4-7 illustrates the designated truck routes in the City of Menlo Park. The designated truck routes in the City of East Palo Alto are on University Avenue (entire length), Bay Road (from Gloria Way to the eastern city limit), East Bayshore Road (entire length), and West Bayshore Road (from Newell Road to eastern city limit). All truck travel, either for excavation or for transporting construction materials to the SUMC Sites, would use these routes. From I-280 and the west, Alpine Road, Junipero Serra Boulevard, Campus Drive West would be used to reach Welch Road. From the East Bay, trucks would use the Dumbarton Bridge. From US 101, either San Antonio Road or Woodside Road would be used to access El Camino Real. From there, trucks would follow Galvez Street to Arboretum Road, and Sand Hill Road to Pasteur Drive. El Camino Real would be used for short construction-related trips from the north and south.

During the peak of construction, it is anticipated that there would be as many as 2,200 construction workers at the SUMC Sites. The combined construction employment for the expansion would average between 300 and 1,615 workers at a given time. Construction workers would tend to travel to the site from longer distances than average employee trips and would therefore tend to have a higher degree of carpooling with a conservative estimate of 1.5 persons per vehicle. The number of peak hour vehicle trips for the peak of construction workers would average between 200 to 1,075. Most of these trips would occur outside of the peak for traffic on the street. The SUMC Project may include creation of remote parking areas for these workers, with shuttles to bring them to and from SUMC Sites if the remote parking areas are distant from the SUMC Sites. Provision of remote parking for construction activities is identified below as a mitigation measure for construction-related traffic impacts. Construction of the remote parking lots as the first phase of construction would make them available for use by construction workers on the remainder of the SUMC Project.
No trucks over 7 tons on this segment of Junipero Serra Blvd.

SPECIAL NOTE
No trucks over 7 tons allowed on Stanford Avenue or Junipero Serra Boulevard between Page Mill Road and Campus Drive East. Use El Camino Real or Sand Hill Road to access the campus.

FIGURE 3.4-7
Menlo Park Truck Routes

Legend

- CITY LIMITS
- UNLIMITED TRUCK ROUTES
- LIMITED TRUCK ROUTES*”
- POINTS OF ENTRY/EXIT

* No Trucks over 3 tons unless there is an origin or destination within the City of Menlo Park

The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the SUMC Sites would be scheduled to occur during off-peak hours and would be required to occur on designated truck routes. Once on-site, heavy construction equipment would generally remain on-site until its use for the job is completed; such equipment would not repeatedly be moved to and from the construction site over public streets.

**MITIGATION MEASURES.** With implementation of the following mitigation measures, the significant construction related traffic impacts would be reduced to less-than-significant levels. (LTS)

**TR-1.1 Provide Off-Street Parking for Construction Related Vehicles.** The SUMC Project sponsors shall be required to provide adequate off-street parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the construction sites, a remote parking area shall be designated, and a shuttle bus shall be operated to transfer construction workers to the job site.

**TR-1.2 Maintain Pedestrian Access.** The SUMC Project sponsors shall be prohibited from substantially limiting pedestrian access while constructing the SUMC Project without prior approval from the City of Palo Alto Department of Public Works. Such approval shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less-than-significant levels. Pedestrian access-limiting actions would include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian re-routing at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions which may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, covered walkways shall be provided.

**TR-1.3 Maintain Bicycle Access.** The SUMC Project sponsors shall be prohibited from limiting bicycle access while constructing the SUMC Project without prior approval from the City of Palo Alto Department of Public Works. Such approval shall require submittal and approval of specific construction management plans that warn cyclists prior to reaching the impacted bicycle lanes and provide alternative routing around the construction sites to mitigate the specific impacts to a less-than-significant level. Bicycle access-limiting actions would include, but not be limited to, bicycle lane closures or narrowing, closing or narrowing of streets that are designated bicycle routes, bridge closures, the placement of construction-related materials within designated bicycle lanes or along bicycle routes, and other actions which may affect the mobility or safety of bicyclists during the construction period.

**TR-1.4 Restrict Construction Hours.** The SUMC Project sponsors shall be required to prohibit or limit the number of construction material deliveries from 7:00 a.m. to 9:00 a.m., and from 4pm to 6pm on weekdays. The SUMC Project sponsors shall
be required to prohibit or limit the number of construction employees from arriving or departing the site from the hours of 4:30 p.m. to 6:00 p.m.

TR-1.5 Restrict Construction Truck Routes. The SUMC Project sponsors shall be required to deliver and remove all construction-related equipment and materials on truck routes designated by the cities of Palo Alto, East Palo Alto and Menlo Park. Heavy construction vehicles shall be prohibited from accessing the site from other routes. Figure 3.4-6 and 3.4-7 of the EIR illustrates the Stanford Area Truck Routes which must be used by all trucks.

TR-1.6 Protect Public Roadways During Construction. The SUMC Project sponsors shall be required to repair any structural damage to public roadways, returning any damaged sections to original structural condition. The SUMC Project sponsors shall survey the condition of the public roadways along truck routes providing access to the proposed project site before construction, and shall again survey after construction is complete. A before-and-after survey report shall be completed and submitted to the City of Palo Alto Public Works Department for review, indicating the location and extent of any damage.

TR-1.7 Maintain Public Transit Access and Routes. The SUMC Project sponsors shall be prohibited from limiting access to public transit, and from limiting movement of public transit vehicles, without prior approval from the Santa Clara County Valley Transportation Authority or other appropriate jurisdiction. Such approval shall require submittal and approval of specific impacts to a less-than-significant level. Potential actions which would impact access to transit include, but are not limited to, relocating or removing bus stops, limiting access to bus stops or transfer facilities, or otherwise restricting or constraining public transit operations.

TR-1.8 Prepare and Implement Construction Impact Mitigation Plan. In lieu of the above mitigation measures, the SUMC Project sponsors shall submit a detailed construction impact mitigation plan to the City of Palo Alto for approval by the Director of Public Works prior to commencing any construction activities with potential transportation impacts. This plan shall address in detail the activities to be carried out in each construction phase, the potential transportation impacts of each activity, and an acceptable method of reducing or eliminating significant transportation impacts. Details such as the routing and scheduling of materials deliveries, construction employee arrival and departure schedules, employee parking locations, and emergency vehicle access shall be described and approved.

TR-1.9 Conduct Additional Measures During Special Events. The SUMC Project sponsors shall implement a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events which attract a substantial number of visitors to the campus. This measure may require a special supplemental permit to be approved by either Santa Clara County
or the City of Palo Alto prior to hosting such events during significant construction phases.

**TR-2. Intersection Level of Service.** Implementation of the SUMC Project would result in significant impacts to intersections during Peak Hour conditions. (S)

**Trip Generation.** SUMC consists of the Stanford University SoM, SHC and LPCH Hospitals and medical office buildings. As part of the proposed expansion, several existing medical office buildings (119,900 square feet) would be demolished. This demolition was taken into account when calculating the trips generated by the SUMC Project. The Hoover Pavilion would be renovated and square footage (60,000 square feet) would be added to this site for the new medical office building, to a total of 144,230 square feet. In addition, adjustment, or “right-sizing” space credit, was applied to the proposed expansion area for the hospitals to better reflect the facilities’ practical use. The hospitals are currently undersized relative to the services they provide. The right-sizing adjustment refers to the part of the proposed expansion that would accommodate the existing uses and would have no impact on the trips generated (see Section 2, Project Description, for a more detailed definition of right-sizing). The proposed expansion of SHC and LPCH that contributes to additionally generated traffic would be 854,970 square feet.9

Trip generation rates for the SUMC Project were determined using data collected from existing facilities. Driveway counts were conducted at 20 parking areas serving the SUMC Sites during the AM (7:00-9:00) and PM (4:00-6:00) Peak Hours. Trip generation rates were then calculated based on the traffic volumes and the size of existing buildings. Trips generated for the full build-out (100 percent) of the SUMC Project in 2025 are shown in Table 3.4-16. The Traffic Impact Analysis (Appendix C) contains details of the review and validation of the hospital trip generation statistics. As shown, the SUMC Project would result in 10,061 daily trips, with 766 trips in the AM Peak Hour and 746 trips in the PM Peak Hour.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Daily</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In</td>
<td>Out</td>
<td>Total</td>
</tr>
<tr>
<td>Hospitals (SHC and LPCH)</td>
<td>9,400</td>
<td>530</td>
<td>171</td>
</tr>
<tr>
<td>Medical Office Buildings</td>
<td>661</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>TOTAL INCREASE IN TRIPS</td>
<td>10,061</td>
<td>580</td>
<td>186</td>
</tr>
</tbody>
</table>


*Note:* There would be no increase in research/laboratory space and operations, and thus no new trip generation.

9 The square footage applied towards calculation of trip generation differs from the square footage identified in Table 2-7 in the Project Description. Square footage applied to trip generation calculations (1) includes only those portions of the hospitals and medical offices at the both the Main SUMC Site and Hoover Pavilion Site that would generate trips, and (2) deducts existing trip-generating uses that would be demolished (at 701, 703, and 1101 Welch Road).
Trip Distribution. After determining the number of trips generated, the trips are distributed and assigned to all study intersections. Distribution is divided into the regional and local patterns to more accurately reflect the origin of trips. SUMC Project trips would be divided into 75 percent regional and 25 percent local. These percentages were derived from existing employees’ zip code data. A majority of peak hour traffic would be associated with employee travel. However, some hospital related peak hour travel would be made by patient and visitors. The travel pattern of patients and visitors would be similar to that of employees during the peak hour travel analysis.

As shown in Figure 3.4-8, of the local trips, approximately:

- 16 percent of the local traffic would be from the northwest, the area located north of Sand Hill Road and west of El Camino Real, along Sand Hill Road and Alameda de las Pulgas;
- 15 percent would be from the northeast, along El Camino Real and Middlefield Road;
- 37 percent would be from the east, along University Avenue, Embarcadero Road, and Oregon Expressway;
- 11 percent would be from the southeast, along Alma Street, Charleston Road, and Middlefield Road;
- 10 percent would be from the southwest, along El Camino Real and Foothill Expressway; and
- 11 percent would be from the west, along Alpine Road and Page Mill Road.

As Figure 3.4-9 shows, regional travel to and from the SUMC Project would primarily be via Bayshore Freeway, I-280, El Camino Real, and the Bayfront Expressway.

Improvements to Local Circulation. As discussed in Section 2, Project Description, the SUMC Project would include several improvements to the local circulation network in the immediate vicinity of the SUMC Sites. These improvements include the following:

- Welch Road. Welch Road would be modified to improve traffic flow. It would become a three-lane roadway with on-street bicycle lanes. There would be one through lane in each direction (11-foot through lanes), with a two-way left turn lane in the center (12-foot center left turn lane). The bicycle lanes would be six feet wide, including the gutter. Right turns into driveways would occur from the through lanes; however, left turns would be removed from the through lanes. The three pedestrian crossings are proposed to be combined into one or two locations. The main pedestrian crossing at the LPCH access would be signalized. A center barrier median would be constructed between Quarry Road and the entrance to LPCH to prevent left turns to and from the driveways.

FIGURE 3.4-8
SUMC Trip Distribution (Local)
• **Durand Way.** An extension of existing Durand Way from Sand Hill Road to Welch Road is proposed. The roadway is proposed as a four-lane cross section, with two lanes in each direction and on-street bicycle lanes. Travel lane widths would be 11 feet and the bicycle lanes would be 6 feet wide, including the gutter pan. The intersections of both Sand Hill Road/Durand Way and Welch Road/Durand Way would be signalized.

• **Quarry Road.** The existing Quarry Road extension to Roth Way would be improved, and a new loop driveway would be constructed near the new SHC clinic/medical office buildings to provide enhanced access to the proposed SHC clinic/medical office buildings. Ingress/egress into the SHC clinic underground garage would be off the Quarry Road extension. The Quarry Road improvements would be a two-lane roadway with on-street bicycle lanes. Lane widths would be 11 feet with 6-foot bicycle lanes including the gutter pan. The connection to existing Quarry Road would be stopped controlled for the Quarry Road extension leg.

• **Roth Way.** The existing Quarry Road extension to Roth Way would be improved. This connection would provide access to a proposed parking structure. Roth Way would be a two-lane roadway with on-street bicycle lanes. The travel lanes would be 11 feet and the bicycle lanes 6 feet including the gutter pan.

• **Pasteur Drive.** The two legs of Pasteur Drive currently exist and provide access to the SUMC and to the underground parking garage. On-street parking would be removed from Pasteur Drive and the roadway would provide two lanes of travel in each direction with on-street bicycle lanes. Travel lanes would be 11 feet with 6-foot bicycle lanes, including the gutter.

• **New Service Connection.** A private street connection is proposed between the intersection of Roth Way/Quarry Road Extension and Pasteur Drive. Stanford has indicated that this service road would be for limited access (emergency vehicles, public transit, service deliveries). This roadway would make a connection between Sand Hill Road at Pasteur Drive and Campus Drive West at Roth Way. As such, it would enhance the grid pattern of the local street network. Local circulation could be improved with this roadway opening to all traffic as a public street.

**Project Impacts.** Based on the level of trips produced by the SUMC Project, and the distribution patterns of these trips, the full buildout of the SUMC Project by 2025 would result in significant impacts at several intersections during AM and PM Peak Hours. These intersections either operate at acceptable LOS levels under 2025 No Project conditions, and with the addition of project traffic, they deteriorate to unacceptable LOS levels; or they already operate at an unacceptable LOS and with the addition of project traffic cause the average control delay for the critical movements to increase by four seconds or more and the volume to capacity ratio (V/C) to increase by 0.1 or more.
As seen in Table 3.4-17, a total of five intersections would be significantly impacted by the SUMC Project during the AM Peak Hour:

- El Camino Real/University Avenue-Palm Drive [intersection #10] – LOS would change from LOS E to F with the average critical delay increasing by 22.6 seconds and the V/C increasing by 0.058. This intersection would be significantly affected by the SUMC Project.

- El Camino Real/Page Mill Road-Oregon Expressway [intersection #16] - LOS would remain at E. The average critical delay would increase by 8.1 seconds and the V/C would increase by 0.026. This intersection would be significantly affected by the SUMC Project.

- Sand Hill Road/Santa Cruz Avenue [intersection #30] – LOS would change from LOS D to E and therefore this intersection would be significantly affected by the SUMC Project.

- Arboretem Road/Galvez Street [intersection #37] (unsignalized) - LOS would remain at E. The City of Palo Alto has not adopted specific criteria for impacts at unsignalized intersections. Therefore, if traffic signal warrants would be met, additional traffic through the intersection would constitute a significant impact. Traffic signal warrants would be met at this intersection, and thus there would be a significant impact at this intersection.

- Alpine Road/I-280 NB Off-Ramp [intersection #62] (unsignalized) - LOS would remain at F. Traffic signal warrants at this intersection are met at baseline conditions as well as with the SUMC Project. There would thus be a significant impact at this intersection.

A total of 12 intersections would be significantly impacted by the SUMC Project during the PM Peak Hour:

- El Camino Real/Ravenswood Avenue [intersection #3] - LOS would remain at E but at least one critical movement for this State-controlled, Menlo Park intersection exceeded 0.8 seconds. This intersection would be significantly affected by the SUMC Project.

- El Camino Real/University Avenue-Palm Drive [intersection #10] – LOS would change from D to E. This intersection would be significantly affected by the SUMC Project.

- El Camino Real/Page Mill Road-Oregon Expressway [intersection #16] - LOS would remain at E. The average critical delay would increase by 5.3 seconds and the V/C ratio would increase by 0.016. This intersection would be significantly affected by the SUMC Project.

- Middlefield Road/Willow Road [intersection #18] LOS would remain at E but the average critical movements would exceed 0.8 seconds for this Menlo Park intersection. This intersection would be significantly affected by the SUMC Project.

- Middlefield Road/Lytton Avenue [intersection #19] - LOS would change from D to E. This intersection would be significantly affected by the SUMC Project.

- Junipero Serra Boulevard/Page Mill Road [intersection #23] - LOS would remain at F. The average critical delay would increase by 6.3 seconds and the V/C ratio would increase by 0.016. This intersection would be significantly affected by the SUMC Project.
<table>
<thead>
<tr>
<th>Intersection</th>
<th>LOS</th>
<th>2025 AM</th>
<th>2025 AM+SUMC</th>
<th>Compare</th>
<th>2025 PM</th>
<th>2025 PM+SUMC</th>
<th>Compare</th>
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<td>15</td>
<td>B</td>
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<td>#23 Junipero Serra Blvd-Foothill Expressway/Page Mill Rd</td>
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Table 3.4-17: LOS Comparison with SUMC Only in 2025 – SUMC Only Project Impact
<table>
<thead>
<tr>
<th>Intersection</th>
<th>2025 AM</th>
<th>2025 AM+ SUMC</th>
<th>Compare</th>
<th>2025 PM</th>
<th>2025 PM+ SUMC</th>
<th>Compare</th>
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<tr>
<td>#25 Junipero/Campus East</td>
<td>B</td>
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<td>#32 Stock Farm/Sand Hill</td>
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<td>20</td>
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<td>#49 US 101SB/Marsh</td>
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<td>0.612</td>
<td>16</td>
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Table 3.4-17

LOS Comparison with SUMC Only in 2025 – SUMC Only Project Impact

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<thead>
<tr>
<th>Intersection</th>
<th>2025 AM</th>
<th>2025 AM+ SUMC</th>
<th>Compare</th>
<th>2025 PM</th>
<th>2025 PM+ SUMC</th>
<th>Δ LOS 2025 PM</th>
<th>Δ LOS 2025 PM+ SUMC</th>
<th>Impact</th>
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</thead>
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<td>#51 Bay/Willow</td>
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<td>23</td>
<td>B- 18.6</td>
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<td>23</td>
<td>0</td>
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<td>65.3</td>
<td>D 43.6</td>
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<td>67.9</td>
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<td>0.012</td>
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<td>86.8</td>
<td>D 44.6</td>
<td>1.064</td>
<td>89.3</td>
<td>2.5</td>
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<td>81.6</td>
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<td>82.9</td>
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<td>0.698</td>
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<td>10.3</td>
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<td>2.524</td>
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<td>11.9</td>
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<td>#63 I-280 SB Off-Ramp/Alpine Road</td>
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<td>273.7</td>
<td>F 277.3</td>
<td>1.719</td>
<td>277.3</td>
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<td>#65 Page Mill Road/I-280 SB Off-Ramp (unsignalized)</td>
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<td>F 105.1</td>
<td>0.745</td>
<td>184.2</td>
<td>-0.8</td>
<td>0.002</td>
</tr>
</tbody>
</table>

Note: Shading indicates significant impacts.
• Junipero Serra Boulevard/Campus Drive West [intersection #26] - LOS would change from E to F. The average critical delay would increased by 4.4 seconds and the V/C ratio would increase by 0.01. This intersection would be significantly affected by the SUMC Project.

• Arboretum Road/Galvez Street [intersection #37] (unsignalized) - LOS would remain at F. Traffic signal warrants would be met at this intersection. This intersection would thus be significantly affected by the SUMC Project.

• Middlefield Road/Ravenswood Avenue [intersection #46] - LOS would change from D to E. This intersection would be significantly affected by the SUMC Project.

• Bayfront Expressway/Willow Road [intersection #52] - LOS would remain at F but at least one critical movement for this State-controlled, Menlo Park intersection would exceed 0.8 seconds. This intersection would be significantly affected by the SUMC Project.

• Bayfront Expressway/University Avenue [intersection #53] - LOS would remain at F but at least one critical movement for this State-controlled, Menlo Park intersection would exceed 0.8 seconds. This intersection would be significantly affected by the SUMC Project.

• Alpine Road/I-280 NB Off-Ramp [intersection #62] (unsignalized) - LOS would remain at F. Traffic signal warrants at this intersection are met at baseline conditions as well as with the SUMC Project. This intersection would be significantly affected by the SUMC Project.

MITIGATION MEASURES. Given the magnitude of the SUMC Project’s intersection impacts, there is no single feasible mitigation measure that can reduce the impacts to a less-than-significant level. However, there are a range of measures that, when taken individually, would each contribute to a partial reduction in the SUMC Project’s impacts. When combined, these measures could result in a substantial reduction in the SUMC Project’s impacts.

A set of five different mitigation measures were identified in the Transportation Impact Analysis. Each measure was then prioritized, the highest priority measure being the most preferable solution, and the lowest priority measure being the least preferable. The following are the five mitigation measures, ranked according to priority:

• Priority 1 mitigation measure – Traffic-adaptive signal technology
• Priority 2 mitigation measure – Additional bicycle and pedestrian undercrossings
• Priority 3 mitigation measure – Enhanced transportation demand management (TDM) program
• Priority 4 mitigation measure – Intersection improvements
• Priority 5 mitigation measure – Remote employee parking lots near freeway interchanges
Several of the Priority 4 mitigation measures would require the acquisition of additional right-of-way, and the construction of additional turn lanes. However, the City of Palo Alto has a stated policy which advocates a multi-modal approach to addressing traffic congestion as opposed to approaches that require an increase in roadway capacity. The City of Menlo Park is also trying to encourage commuters to use alternative modes of travel to the automobile. For these reasons, several of the Priority 4 measures are considered to be infeasible. Only those intersection improvements that are considered to be feasible were included in the analysis of the SUMC Project’s impacts.

The Priority 3 and Priority 5 measures would be alternatives to each other, both aimed at reducing the traffic impacts of the same target population, SUMC’s longer distance commuters. They are viewed as “either or” measures, and would not be implemented together. The remote parking lot mitigation measure (Priority 5) was developed as an alternative to the enhanced TDM program. The discussion and analysis of this mitigation measure is included in Appendix D.

The Priority 1 mitigation measure was analyzed first to determine to what extent it ameliorated the SUMC Project’s impacts by itself. The Priority 1 mitigation measure was then combined with other lower priority mitigation measures to determine the combined impact reduction. The following combinations of mitigation measures are analyzed below:

- Priority 1 + Priority 2
- Priority 1 + Priority 2 + Priority 3
- Priority 1 + Priority 2 + Priority 3 + Priority 4

**Traffic Adaptive Signal Technology.** Traffic-adaptive signals were first implemented in Palo Alto along the Charleston-Arastradero corridor. This technology reduces overall intersection delay by sensing traffic movements as they approach the intersection and adjusting the signal indications to serve those vehicles. The City estimates that overall intersection delay can be reduced by up to 12 percent with the installation of traffic-adaptive signal technology. Mitigation Measure TR-2.1 requires Stanford University to make a fair-share financial contribution towards the implementation of traffic adaptive signals.

The City has identified the following corridors for the implementation of traffic-adaptive signal technology:

- Sand Hill Road (Oak Creek to Shopping Center) - 4 signals
- Arboretum Road (Shopping Center to Palm Drive) - 3 signals
- Embarcadero Road (Bryant to Saint Francis) - 7 signals
- University Avenue (Palm to Lincoln) - 13 signals
- Lytton Avenue (Alma to Middlefield) - 10 signals
- Hamilton Avenue (Alma to Middlefield) - 10 signals
• Middlefield Road (San Antonio to Homer) - 9 signals
• Charleston Road (Alma to Middlefield) - 2 signals
• El Camino Real (northern city limits of Menlo Park to southern city limits of Palo Alto) – signals would require approval of Caltrans

In the AM Peak Hour, the intersection of El Camino Real/Page Mill Road-Oregon Expressway (intersection #16) would no longer be impacted with the implementation of traffic adaptive signal technology. However, the following four intersections would remain significantly impacted.

• El Camino Real/University Avenue – Palm Drive [intersection #10]
• Santa Cruz Avenue/Sand Hill Road [intersection #30]
• Arboretum Road/Galvez Street [intersection #37]
• Alpine Road/I-280 northbound off-ramp [intersection #62]

In the PM Peak Hour, implementation of traffic adaptive signal technology would alleviate impacts at the following three intersections.

• El Camino Real/Ravenswood Avenue [intersection #3]
• El Camino Real/Page Mill Road-Oregon Expressway [intersection #16]
• Middlefield Road/Lytton Avenue [intersection #19]

However, the following nine intersections would remain significantly impacted.

• El Camino Real/University Avenue-Palm Drive [intersection #10]
• Middlefield Road/Willow Road [intersection #18]
• Junipero Serra Boulevard – Foothill Expressway/Page Mill Road [intersection #23]
• Junipero Serra Boulevard/Campus Drive West [intersection #26]
• Arboretum Road/Galvez Street [intersection #37]
• Middlefield Road/Ravenswood Avenue [intersection #46]
• Bayfront Expressway/Willow Road [intersection #52]
• University Avenue/Bayfront Expressway [intersection #53]
• Alpine Road/I-280 northbound off-ramp [intersection #62]

**New Bicycle and Pedestrian Undercrossings.** In addition to the existing undercrossings at University Avenue and Homer Avenue, two new bicycle and pedestrian undercrossings would be constructed in the Study Area in the future. One would be near Everett Avenue in Palo Alto.
and the other would be near Middle Avenue in Menlo Park. These additional undercrossings north of University Avenue would facilitate walking and bicycling from residential and commercial areas in north Palo Alto and south Menlo Park. Mitigation Measure TR-2.2 requires Stanford University to make a fair-share financial contribution towards the construction of the Everett Avenue and Middle Avenue undercrossings.

Based on the traffic distribution percentages that are based on SUMC employee zip codes, the number of existing employees living in the vicinity of the four bicycle and pedestrian undercrossings for SUMC would be approximately 625. Based on a mode split of six percent, 37 existing SUMC employees would bike or walk to the SUMC Sites. The existing mode split of 3.1 percent to bicycle and walk for hospital employees would be doubled (to six percent) to account for two existing undercrossings increasing to four. In the future, if the percentage would double to 12 percent, the number of existing employees who walk or bike to the SUMC Sites would be 75.

The number of new SUMC Project employees in 2025 would be 2,311. The number of employees coming from the vicinity of the four undercrossings would be 173 in 2025. Based on the future mode split (12 percent), the number of new SUMC Project employees who would use these facilities would be 21 in 2025. Up to 96 employees, in total, from the SUMC would use the four bicycle and pedestrian undercrossings in the Study Area in 2025, when the SUMC Project would be at its full buildout. Consequently, the overall reduction of SUMC Project vehicular traffic trips during the AM/PM Peak Hour would be 23 trips in 2025.

In addition to the existing and future SUMC traffic that can be reduced by the added undercrossings, existing and future traffic to and from the larger University would also benefit from the added undercrossings. The Peak Hour reduction in 2025 for hospital traffic calculated above represents about three percent of the total SUMC Project traffic. A similar adjustment has been applied to non-project traffic using the adjacent street network to gauge the true benefit of the new undercrossings.

In the AM Peak Hour, combining bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2) with traffic adaptive signal technology (Mitigation Measure TR-2.1) would reduce the SUMC Project’s impacts at one additional intersection. In addition to the intersection of El Camino Real and Page Mill Road – Oregon Expressway, the intersection of El Camino Real and University Avenue – Palm Drive would also no longer be impacted.

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10 For the purposes of determining usage of bicycle and pedestrian undercrossings, a slightly higher number of employees (2,311) are used than is shown in Section 2, the Project Description (2,242 employees). As a result, this analysis provides a conservative usage of bicycle and pedestrian undercrossings. Employment used here is based on the following memorandum: Fehr & Peers Transportation Consultants, Analysis of GO Pass Program for Hospital Employees, September 22, 2008, pp. 9-10. See Appendix H to the Transportation Impact Analysis.
However, the following three intersections would remain significantly impacted:

- Santa Cruz Avenue/Sand Hill Road  [intersection #30]
- Arboretum Road/Galvez Street   [intersection #37]
- Alpine Road/I-280 northbound off-ramp [intersection #62]

In the PM Peak Hour, combining bicycle and pedestrian undercrossings with traffic adaptive signal technology would not result in any change in the number of intersections adversely impacted by the SUMC Project. As with the implementation of traffic adaptive signal technology by itself, implementation of the combination of traffic adaptive signal technology and bicycle and pedestrian undercrossings would alleviate impacts at the following three intersections:

- El Camino Real/Ravenswood Avenue [intersection #3]
- El Camino Real/Page Mill Road-Oregon Expressway [intersection #16]
- Middlefield Road/Lytton Avenue [intersection #19]

The same nine intersections would remain significantly impacted even with implementation of both traffic adaptive technology (Mitigation Measure TR-2.1) and bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2):

- El Camino Real/University Avenue-Palm Drive  [intersection #10]
- Middlefield Road/Willow Road  [intersection #18]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road  [intersection #23]
- Junipero Serra Boulevard/Campus Drive West  [intersection #26]
- Arboretum Road/Galvez Street  [intersection #37]
- Middlefield Road/Ravenswood Avenue  [intersection #46]
- Bayfront Expressway/Willow Road  [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]
- Alpine Road/I-280 northbound off-ramp  [intersection #62]

**Enhanced Transportation Demand Management Program.** Stanford University currently implements a TDM program for its employees. The TDM program for SUMC includes providing VTA Eco-Passes to employees. The Eco-Pass allows unlimited travel on VTA buses and light rail vehicles. However, most SUMC employees (77.1 percent) continue to drive alone to work, whereas only 54.4 percent of the rest of the larger University’s employees drive alone to work. There is thus a difference in commuting patterns between SUMC employees and employees in the rest of the University. Mitigation Measure TR-2.3 requires the SUMC
Project sponsors to enhance the current TDM program, with the intent to increase the percentage of SUMC employees who commute by Caltrain. This increased use of Caltrain would be achieved by purchasing Caltrain GO Passes or an equivalent TDM measure for SUMC employees, following the example set by Stanford University where 15.8 percent of its employees use Caltrain. Assuming that this goal could be achieved, then the percentage of SUMC employees that commute by alternative modes of transportation (carpool, vanpool, bus, Caltrain, bicycle, walk) would increase from the current 22.9 percent to 35.1 percent. An equivalent TDM measure may also be implemented. The following analysis is based on SUMC achieving a similar Caltrain mode share as Stanford University currently achieves.

Stanford University currently purchases Caltrain GO Passes for its academic campus employees; SUMC employees are not currently eligible to receive the Caltrain GO Pass under the current TDM program. The Caltrain Go Pass is an annual train pass purchased by companies for their employees. Employees eligible for a Caltrain GO Pass are those who do not live on campus and work more than 20 hours a week. This is estimated to be about 10,000 SUMC employees when the SUMC Project would be fully built out. The University currently has a total employment of approximately 11,000 and purchases 9,400 GO Passes annually. GO Passes or an equivalent TDM measure could offer a great level of traffic mitigation for the SUMC Project because this measure could potentially shift both new and existing trips from auto mode to transit.

Stanford monitors the mode split to the University and to the SUMC. The current mode split for the University to Caltrain is 15.8 percent. The current mode split for the SUMC to Caltrain is 3.6 percent. The existing number of employees at the SUMC is approximately 8,300. The future number of employees would be approximately 10,600.11 Although some of the SUMC employees commute during the evening and on weekends, 89 percent of the SUMC employment base work on weekdays, during typical daytime hours.

The likelihood of using Caltrain is a function of place of residence. Employee location data indicates that 52 percent of the University employees on the Peninsula live within a city that is served by Caltrain. For SUMC employees, this percentage increases to 65 percent.

With the implementation of GO Passes or an equivalent TDM measure for SUMC employees, the use of Caltrain by 2025 is estimated to reach the current level found for the University. A mode split to Caltrain of 15.8 percent would reduce the AM Peak Hour inbound traffic from the project analysis by about 500 trips, with the same level of reduction for outbound PM Peak Hour trips. In addition, there would also be parking savings at the SUMC Sites. The expected overall parking saving in 2025 would be approximately 720 spaces; of which 190 spaces are attributed to the new employees from the SUMC Project. The Transportation Impact Analysis (Appendix C) presents the details. Annual monitoring and reporting would be required to

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11 Based on employment identified in the following memorandum: Fehr & Peers Transportation Consultants, Analysis of GO Pass Program for Hospital Employees, September 22, 2008, pp. 9-10. See Appendix H to the Transportation Impact Analysis.
ensure that the assumed modal split to Caltrain and away from the single occupant vehicles would actually be achieved. Since GO Passes would only be applicable to employees living near the Caltrain corridor, it is assumed that employees from the East Bay area would have the option of parking at the Ardenwood Park and Ride Lot and transferring to public transit (U Line).

If the desired mode split would not be achieved in the design year, the SUMC Project sponsors would be required to further expand and improve the TDM program. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not drive.

The initial enhancements to the TDM program should include the following:

- Provide Caltrain GO Passes, or an equivalent TDM measure, to all eligible SUMC employees.
- If Caltrain GO Passes would be provided to SUMC employees, arrangements would also be needed to lease 75 spaces at the Ardenwood Park and Ride Lot, for those employees commuting from the East Bay.
- Expand bus service in support of the issuance of GO Passes.
- Expand the Marguerite shuttle bus service, and integrate it with the other City of Palo Alto shuttle bus service.
- Expand and improve the bicycle and pedestrian networks.
- Provide a full-time on-site TDM coordinator by 2015 for the hospital components. The coordinator would be responsible for organizing and disseminating TDM information primarily to hospital employees and also to hospital patients. A central location would be made available to provide information on alternative travel modes. Also, the hospital website would contain information on TDM programs.
- Provide a guaranteed ride home program for all employees who use transit and other transport alternatives like carpool and vanpool. The guarantee ride home allows employees with dependent children the ability to use alternative modes to travel to and from work but still be able to travel home mid-day in case of an emergency.
- Provide employees with shower facilities within the SUMC to encourage bicycling to work. Bicycle storage facilities would also be required on the SUMC Sites, in areas conveniently located near the employee showers.
- Perform annual TDM monitoring and submit the report to the City of Palo Alto to ensure that the assumed modal split to alternative forms of travel and away from autos would actually be achieved.
- Establish, in conjunction with the GO Pass implementation, a “Zip Car” program with Zip cars available at the SUMC Sites.
Combining the effects of the three mitigation measures:

- Traffic adaptive signal technology (Mitigation Measure TR-2.1)
- Additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2)
- Enhanced Transportation Demand Management (Mitigation Measure TR-2.3)

would completely mitigate the SUMC Project’s intersection impacts during the AM Peak Hour. SUMC Project impacts at all five previously affected intersections would be alleviated.

In the PM Peak Hour, significant impacts at eight intersections would be alleviated. However, the following four intersections would remain significantly impacted:

- Middlefield Road/Willow Road [intersection #18]
- Arboretum Road/Galvez Street [intersection #37]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]

If GO Passes or an equivalent TDM measure are provided to SUMC employees, the congestion levels at some intersections would be reduced to a less-than-significant level. The TDM measures proposed as mitigation measures would increase transit ridership on some routes, as indicated in the discussion under Impact TR-7. At such time that ridership load factors during either the AM or PM peak exceed 1.0 on the U Line, headways would need to be decreased to bring the load factor to less than 1.0. Load factor is the ratio of number of passenger versus the number of seats. A load factor of 1.0 means the number of passengers equals the number of seats and no passenger would be standing. Monitoring would need to be conducted periodically to determine the current load factor. At such time that ridership load factors during either the AM or PM peak exceed 1.25 on Marguerite Line A or Line B Counter-Clockwise, headways would need to be decreased to bring the load factor to less than 1.25. Monitoring would need to be conducted periodically to determine the current load factor.

**Intersection Improvements.** Intersection improvements include a range of measures such as signalizing a stop controlled intersection, re-configuring an intersection by changing the way that specific lanes are used, and adding capacity to an intersection by increasing the number of lanes. Theoretically, implementation of these improvements would, by themselves and without the implementation of any other mitigation measures, completely alleviate all of the SUMC Project’s impacts during the AM and PM Peak Hours.

Intersection improvements have been identified at the following 13 intersections:

- El Camino Real/Ravenswood Avenue [intersection #3]
- El Camino Real/University Avenue - Palm Drive [intersection #10]
- El Camino Real/Page Mill Road - Oregon Expressway [intersection #16]
Table 3.4-18 provides a detailed description of the improvements at each intersection. The improvements to intersections in the City of Menlo Park are from the City’s General Plan. As shown in Table 3.4-18, only some of the identified improvements are physically feasible, for several reasons. First, the City of Palo Alto has adopted a policy\textsuperscript{12} that discourages the addition of roadway capacity. The specific wording of this policy is below:

\begin{quote}
Policy T-27: Avoid major increases in street capacity unless necessary to remedy severe traffic congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with those of pedestrians and bicyclists.
\end{quote}

In addition, the City of Menlo Park is also trying to encourage commuters to use alternative modes of travel to the automobile. Also, while several of the intersection improvements in Table 3.4-18 would not result in additional capacity, some of these improvements are only considered to be potentially feasible. In some cases these intersection improvements are not included in their respective jurisdiction’s general plan. The ultimate decision as to whether to implement the improvements in the Cities of Palo Alto and Menlo Park rests with their City Councils. Pending these decisions, the ultimate feasibility of the improvements is uncertain. Lastly, there is also a degree of uncertainty regarding some of the improvements’ funding. The SUMC Project sponsors would be responsible for contributing a fair-share amount towards the feasible improvements. However, complete funding needs for some of the improvements have yet to be determined or acquired.

<table>
<thead>
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<th>#</th>
<th>Intersection</th>
<th>Peak Hour</th>
<th>Jurisdiction</th>
<th>Roadway Mitigation</th>
<th>Feasible?</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>El Camino Real/University Avenue - Palm Drive</td>
<td>AM/PM</td>
<td>Caltrans</td>
<td>Provide an exclusive right-turn lane for eastbound and westbound Palm Drive-University Avenue, giving two lanes to the through movement along Palm Drive-University Avenue. While physically possible, this mitigation would require the acquisition of right-of-way, the construction of a retaining wall for the westbound right turn and the relocation of the entrance arch to Stanford for the eastbound right turn. This mitigation measure would be inconsistent with City General Plan Policy T-27.</td>
<td>Not Feasible</td>
</tr>
<tr>
<td>16</td>
<td>El Camino Real/Page Mill Road - Oregon Expressway</td>
<td>AM/PM</td>
<td>Caltrans</td>
<td>Provide an exclusive right-turn lane for westbound Oregon Expressway in addition to the two through lanes and increase the cycle length to 160 seconds. The westbound right turn lane would be feasible, but would require right-of-way from the VTA park-and-ride lot. This mitigation is consistent with previous identified mitigation for the 1998-2010 Palo Alto Comprehensive Plan EIR.</td>
<td>Feasible</td>
</tr>
<tr>
<td>62</td>
<td>Alpine Road / I-280 NB Off-Ramp</td>
<td>AM/PM</td>
<td>Caltrans</td>
<td>Signalize the intersection. Signalization of this intersection would be feasible. Traffic signal warrants are met.</td>
<td>Potentially Feasible</td>
</tr>
<tr>
<td>37</td>
<td>Arboretum Road / Galvez Street</td>
<td>AM/PM</td>
<td>Santa Clara County; within Stanford University</td>
<td>Signalize the intersection. Signalization of this intersection would be feasible. Traffic signal warrants are met.</td>
<td>Feasible</td>
</tr>
<tr>
<td>30</td>
<td>Santa Cruz Avenue/Sand Hill Road</td>
<td>AM</td>
<td>Menlo Park</td>
<td>This intersection is fully built-out, additional improvements would be difficult to implement. Northbound Santa Cruz Avenue needs an additional right turn lane. The right-of-way requirements and cost make the improvements infeasible. This intersection is under the jurisdiction of Menlo Park. Any capacity improvements would require their approval.</td>
<td>Not Feasible</td>
</tr>
<tr>
<td>3</td>
<td>El Camino Real/Ravenswood Avenue</td>
<td>PM</td>
<td>Caltrans</td>
<td>Under Menlo Park’s General Plan, the proposed improvements are: to re-stripe the exclusive right-turn lane on southbound El Camino Real to shared through/right lane and to provide an additional through lane for northbound El Camino Real by removing the right-turn slip island. The general plan improvement also proposes to provide an exclusive right-turn lane for eastbound Menlo Avenue. This intersection is located in Menlo Park. Approval for implementation would be required from Caltrans and Menlo Park.</td>
<td>Potentially Feasible</td>
</tr>
<tr>
<td>#</td>
<td>Intersection</td>
<td>Peak Hour</td>
<td>Jurisdiction</td>
<td>Roadway Mitigation</td>
<td>Feasible?</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>52</td>
<td>Bayfront Expressway/Willow Road</td>
<td>PM</td>
<td>Caltrans</td>
<td>Provide one more right-turn lane for eastbound Willow Road and make the right-turn movement for southbound Bayfront Expressway “overlap” with the left-turn of eastbound Willow Road. The intersection has signals for the right-turn movement for southbound Bayfront but the ‘overlap’ phase is not implemented. The intersection performance would also improve with only the additional eastbound right-turn lane provision. Implementation would be physically possible. This intersection is located in Menlo Park. Changes to the traffic signal would require consent from Caltrans and Menlo Park. The Peninsula Gateway transportation analysis suggested grade-separation of this intersection.</td>
<td>Potentially Feasible</td>
</tr>
<tr>
<td>53</td>
<td>University Avenue/Bayfront Expressway</td>
<td>PM</td>
<td>Caltrans</td>
<td>Grade separate the northbound left-turn from Bayfront Expressway to University Avenue. This intersection is located in Menlo Park. Approval for implementation would be required from Caltrans and Menlo Park. The Peninsula Gateway transportation analysis also suggested grade-separation of this intersection.</td>
<td>Not Feasible</td>
</tr>
<tr>
<td>23</td>
<td>Junipero Serra Boulevard – Foothill Expressway/Page Mill Road</td>
<td>PM</td>
<td>Santa Clara County</td>
<td>Provide three left-turn lanes for northbound Foothill Expressway onto westbound Page Mill Road. Page Mill Road must be widened to receive the three turn lanes. Though physically possible, it would be costly to widen Page Mill Road between Junipero Serra Boulevard and Old Page Mill Road (or Coyote Hill Road) and Foothill Expressway. This intersection is under the jurisdiction of Santa Clara County and implementation of any mitigation measures would require their approval.</td>
<td>Not Feasible</td>
</tr>
<tr>
<td>26</td>
<td>Junipero Serra Boulevard/Campus Drive West</td>
<td>PM</td>
<td>Santa Clara County</td>
<td>Increase signal cycle length to 90 seconds. This mitigation would be potentially feasible. This intersection is under the jurisdiction of Santa Clara County. Changes to the signal timing would require County approval.</td>
<td>Potentially Feasible</td>
</tr>
<tr>
<td>18</td>
<td>Middlefield Road/Willow Road</td>
<td>PM</td>
<td>Menlo Park</td>
<td>Make the right-turn movement for northbound Middlefield Road 'overlap' with the left-turn of westbound Willow Road. To effectively utilize the additional capacity of right-turn signal overlap, the existing right-turn should be lengthened. This measure would be physically possible. However, extending the right-turn lane would require removal of the planter box and also removal of several on-street parking</td>
<td>Not Feasible</td>
</tr>
</tbody>
</table>
### Table 3.4-18
Intersection Improvements

<table>
<thead>
<tr>
<th>#</th>
<th>Intersection</th>
<th>Peak Hour</th>
<th>Jurisdiction</th>
<th>Roadway Mitigation</th>
<th>Feasible?</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Middlefield Road/Lytton Avenue</td>
<td>PM</td>
<td>Palo Alto</td>
<td>Provide a new exclusive right-turn lane for southbound Middlefield Road. This would provide two southbound through lanes and a right turn lane. This mitigation would be infeasible because of right-of-way required from the residences, removal of mature trees and reducing the width of already narrow front yards. Capacity improvements at this intersection would be contrary to the City’s General Plan Policy T-27.</td>
<td>Not Feasible</td>
</tr>
<tr>
<td>46</td>
<td>Middlefield Road/Ravenswood Avenue</td>
<td>PM</td>
<td>Menlo Park</td>
<td>Under Menlo Park’s General Plan, the proposed improvement for this intersection would be to provide an additional exclusive left-turn lane for northbound Middlefield Road. This intersection is located in Menlo Park. Traffic capacity improvements would require their approval.</td>
<td>Potentially Feasible</td>
</tr>
</tbody>
</table>


The three feasible intersection improvements in Table 3.4-18 were combined with the other three higher priority mitigation measures, to determine what the combined impact of all four mitigation measures would be. Implementation of the feasible improvements would be required under Mitigation Measure TR-2.4. Mitigation Measure TR-2.5 requires the City of Palo Alto to work with other jurisdictions towards achieving feasibility for improvements that have been determined to be potentially feasible; subsequently, the SUMC Project sponsors would be required to pay their fair share towards those improvements determined to be feasible. However, since feasibility of those potentially feasible improvements is uncertain, then Mitigation Measure TR-2.5 is not counted towards post-mitigation conclusions for the SUMC Project. If the following four mitigation measures:

- Traffic adaptive signal technology (Mitigation Measure TR-2.1)
- Additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2)
- Enhanced Transportation Demand Management (Mitigation Measure TR-2.3)
- Feasible intersection improvements (Mitigation Measure TR-2.4)

were to be implemented together, they would completely mitigate the SUMC Project’s intersection impacts during the AM Peak Hour. SUMC Project impacts at all five previously affected intersections would be alleviated.
In the PM Peak Hour, project impacts at nine intersections would be alleviated. However, the following three intersections would remain significantly impact:

- Middlefield Road/Willow Road [intersection #18]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]

Summary. The results of the above sequential analysis are summarized in Table 3.4-19. Under all combinations of feasible mitigation measures, impacts of the SIMC Project on intersection LOS would remain significant and unavoidable. Of all of the feasible combinations, the one that would have the largest reduction in impact, and that mitigates the greatest number of the intersection impacts, would be the combination of traffic adaptive signal technology (Priority 1), additional bicycle and pedestrian undercrossings (Priority 2), enhanced Travel Demand Management program (Priority 3), and feasible intersection improvements (Priority 4). This combination of mitigation measures would reduce the SUMC Project impacts to a less-than-significant level at all of the impacted intersections during the AM Peak Hour. However, intersection impacts would remain significant and unavoidable in the PM Peak Hour at the following three intersections with mitigation. (SU)

- Middlefield Road/Willow Road [intersection #18]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]

<table>
<thead>
<tr>
<th>Combination of Mitigation Measures</th>
<th># of Remaining AM Peak Hour Intersections Impacted</th>
<th># of Remaining PM Peak Hour Intersections Impacted</th>
<th>Significance Level with Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>4</td>
<td>9</td>
<td>SU</td>
</tr>
<tr>
<td>P1 + P2</td>
<td>3</td>
<td>9</td>
<td>SU</td>
</tr>
<tr>
<td>P1 + P2 + P3</td>
<td>0</td>
<td>4</td>
<td>SU</td>
</tr>
<tr>
<td>P1 + P2 + P3 + P4</td>
<td>0</td>
<td>3</td>
<td>SU</td>
</tr>
</tbody>
</table>

Note: SU = Significant and Unavoidable

TR-2.1 Install Traffic Adaptive Signal Technology. The SUMC Project sponsors shall contribute to the Palo Alto Citywide Traffic Impact Fee program, for the installation of traffic adaptive signals. However, this fee is not structured to mitigate one hundred percent of project related impacts, and an additional fee could be imposed by the City on the SUMC Project sponsors to mitigate the remaining
share of the SUMC Project impacts. In Menlo Park, the SUMC Project sponsors shall contribute their fair share amount, which shall be tied to the amount of traffic added to analyzed intersections by the SUMC Project. The SUMC Project sponsors’ contributions shall apply towards the installation of traffic adaptive signals as listed below.

- Sand Hill Road (Oak Creek to Shopping Center) - 4 signals
- Arboretum Road (Shopping Center to Palm Drive) - 3 signals
- Embarcadero Road (Bryant to Saint Francis) - 7 signals
- University Avenue (Palm to Lincoln) - 13 signals
- Lytton Avenue (Alma to Middlefield) - 10 signals
- Hamilton Avenue (Alma to Middlefield) - 10 signals
- Middlefield Road (San Antonio to Homer) - 9 signals
- Charleston Road (Alma to Middlefield) - 2 signals
- El Camino Real (northern city limits of Menlo Park to southern city limits of Palo Alto) – signals would require approval of Caltrans

**TR-2.2 Fund Additional Bicycle and Pedestrian Undercrossings.** The SUMC Project sponsors shall contribute their fair share to the cost of construction of the Everett Avenue undercrossing of the Caltrain tracks in Palo Alto and the Middle Avenue undercrossing in Menlo Park. In Palo Alto, there is a Citywide Traffic Impact Fee program that the SUMC Project sponsors shall contribute to. However, this fee is not structured to mitigate one hundred percent of the SUMC Project related impacts, and an additional fee may be imposed by the City to mitigate the remaining share of the SUMC Project impacts. In Menlo Park, the fair share contribution shall be tied to the amount of traffic added to analyzed intersections by the SUMC Project. The construction of the Everett Avenue and Middle Avenue undercrossings would reduce traffic volumes on nearby streets, such as Ravenswood Avenue and University Avenue.

**TR-2.3 Enhance Stanford University Travel Demand Management (TDM) Program.** The SUMC Project sponsors shall enhance the currently-implemented TDM program in order to achieve 35.1 percent usage of alternative transportation modes (i.e., carpool, vanpool, bus, Caltrain, bicycle, and walk) by SUMC employees. The initial enhancements to the SUMC TDM program shall include the following:

- Provide Caltrain GO Passes, or an equivalent TDM measure, to all eligible hospital employees and set target Caltrain mode share for hospital employees equal to 15.8 percent.
• If Caltrain GO Passes would be provided to SUMC employees, make arrangements with AC Transit to lease 75 spaces at the Ardenwood Park & Ride Lot, to serve SUMC employees who commute from the East Bay.

• Expand bus service in support of the issuance of GO Passes.

• Expand the Marguerite shuttle bus service, and integrate it with the other City of Palo Alto shuttle bus service.

• Maintain load factors less than 1.00 on the U Line, and less than 1.25 on the Marguerite shuttle.

• Expand and improve the bicycle and pedestrian networks.

• Provide a full-time on-site TDM coordinator by 2015 for the hospital components. The coordinator would be responsible for organizing and disseminating TDM information primarily to hospital employees and also to hospital patients. A central location would be made available to provide information on alternative travel modes. Also, the SUMC or hospitals’ website would contain information on TDM programs.

• Provide a guaranteed ride home program for all employees who use transit and other transport alternatives like carpool and vanpool. The guarantee ride home shall allow employees with dependent children the ability to use alternative modes to travel to and from work but still be able to travel home mid-day in case of an emergency.

• Provide employees with shower facilities within the SUMC Sites to encourage bicycling to work. The SUMC Project sponsors shall also provide bicycle storage facilities on the SUMC Sites that would be conveniently located near the employee showers.

• Establish, in conjunction with the GO Pass implementation, a “Zip Car” (or other similar car-sharing program) with Zip Cars available at the medical complex.

• Perform annual TDM monitoring and submit the report to the City of Palo Alto to ensure that the assumed modal split to alternative forms of travel and away from autos would be actually achieved.

These enhancements may not immediately change the mode split for SUMC employees, because many employees would be unable to change long standing commute patterns overnight. However, with the passage of a mutually agreed amount of time, it is expected that the enhanced TDM program would gradually result in a shift in the mode split of SUMC employees. If this proves not to be the case, then a second round of improvements to the TDM program shall be implemented. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not
drive. If, by the year 2025, at least 35.1 percent of SUMC employees are not using alternative transportation modes, then a second round of improvements to the TDM shall be implemented. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not drive. Thereafter, SUMC Project sponsors shall monitor/survey employee use of alternative modes of transportation on an at least bi-annual basis, and shall continue to improve its TDM program, until it is confirmed to the satisfaction of the City that the target of 35.1 percent usage has been met.

**TR-2.4 Fund or Implement those Intersection Improvements that Have Been Determined to be Feasible.** The SUMC Project sponsors shall implement the following measures:

- For the intersection of El Camino Real/Page Mill Road - Oregon Expressway, the SUMC Project sponsors shall pay a fair share towards (1) provision of exclusive right-turn lane for westbound Oregon Expressway, in addition to the two through lanes, (2) increasing the cycle length to 160 seconds. Improvements to the westbound right turn lane would require right-of-way from the VTA park-and-ride lot.

- At the intersection of Arboretum Road/Galvez Street, the SUMC Project sponsors shall install a traffic signal.

**TR-2.5 Coordinate with Other Jurisdictions for Potentially Feasible Roadway Improvements.** The City of Palo Alto shall work with other jurisdictions to try to achieve feasibility for the following roadway improvements or adjustments. In the event that one or more of the below improvements would then be determined to be feasible, the SUMC Project sponsors shall pay their fair share towards implementation of the improvements, if a fair share contribution would apply.

- Alpine Road/I-280 NB Off-Ramp - Signalize this intersection. The City shall coordinate with Caltrans regarding feasibility of these improvements.

- El Camino Real/Ravenswood Avenue - Re-stripe the exclusive right-turn lane on southbound El Camino Real to a shared through/right lane. Also, provide an additional through lane for northbound El Camino Real by removing the right-turn slip island. Also, provide an exclusive right-turn lane for eastbound Menlo Avenue. The City shall coordinate with the City of Menlo Park and Caltrans regarding feasibility of these improvements.

- Bayfront Expressway/Willow Road - Provide one more right-turn lane for eastbound Willow Road and make the right-turn movement for southbound Bayfront Expressway “overlap” with the left-turn of eastbound Willow Road. The intersection has signals for the right-turn movement for southbound Bayfront Expressway, but the “overlap” phase is not implemented. The City shall coordinate with the City of Menlo Park regarding feasibility of these improvements.
• Middlefield Road/Ravenswood Avenue - Provide an additional exclusive left-turn lane for northbound Middlefield Road. The City shall coordinate with the City of Menlo Park regarding feasibility of this improvement.

• Junipero Serra Boulevard/Campus Drive West – Request that Santa Clara County change the signal cycle length at this intersection to 90 seconds. The City shall coordinate with the County of Santa Clara regarding feasibility of this adjustment.

TR-3. Impacts on Roadway Segments. The SUMC Project would result in adverse traffic impacts to roadway segments in the City of Menlo Park. (S)

The TIRE Index analysis methodology was used to evaluate the traffic impacts of the SUMC Project on residential roadways in 2025. As can be seen in Table 3.4-20, the SUMC Project would not have a significant impact on any residential roadway segments in 2025.

For roadway segments in Menlo Park, an ADT analysis was conducted that involved estimating the net increase in traffic volumes that would result from implementation of the SUMC Project. For Marsh Road, Sand Hill Road, Willow Road, Alpine Road and Ravenswood Avenue that are classified as minor arterials with No Build volumes greater than 18,000, adding more than 100 trips in ADT would be considered a significant impact (see Table 3.4-21).

The SUMC Project would add more than 300 trips on these roadway segments. As such, the SUMC Project would impact these roadway segments in Menlo Park according to the City of Menlo Park’s significance criteria. All other roadway segments in Menlo Park would not be significantly impacted by the SUMC Project.

MITIGATION MEASURES. With the provision of additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2), the enhanced TDM program (Mitigation Measure TR-2.3), and contribution to the City of Menlo Park shuttle fee (Mitigation Measure TR-7.2), there would still be significant impacts on four Menlo Park roadways, including Marsh Road, Willow Road, Sand Hill Road, and Alpine Road, as shown in Table 3.4-22. Therefore, the traffic impacts to Marsh Road, Sand Hill Road, Willow Road, and Alpine Road would remain significant and unavoidable with mitigation. (SU)
### Table 3.4-20
Impacts on Residential Roadways, Based on TIRE Index

<table>
<thead>
<tr>
<th>Residential Road</th>
<th>Segment</th>
<th>2025 No Project</th>
<th>2025 with SUMC Project</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ADT</td>
<td>TIRE Index</td>
</tr>
<tr>
<td>Santa Cruz Avenue</td>
<td>N of Sand Hill Road</td>
<td>25,747</td>
<td>4.4</td>
</tr>
<tr>
<td>Sharon Road</td>
<td>N of Sharon Park Drive</td>
<td>4,774</td>
<td>3.7</td>
</tr>
<tr>
<td>Stanford Avenue</td>
<td>N of Sand Hill Road</td>
<td>186</td>
<td>2.3</td>
</tr>
<tr>
<td>Leland Avenue</td>
<td>N of Sand Hill Road</td>
<td>337</td>
<td>2.5</td>
</tr>
<tr>
<td>Vine Street</td>
<td>N of Sand Hill Road</td>
<td>429</td>
<td>2.6</td>
</tr>
<tr>
<td>Hawthorne Avenue</td>
<td>East of Alma Street</td>
<td>2,193</td>
<td>3.3</td>
</tr>
<tr>
<td>Everett Avenue</td>
<td>East of Alma Street</td>
<td>1,759</td>
<td>3.2</td>
</tr>
<tr>
<td>Hamilton Avenue</td>
<td>Between Chaucer Street and Lincoln Avenue</td>
<td>3,121</td>
<td>3.5</td>
</tr>
</tbody>
</table>


### Table 3.4-21
2025 with SUMC Project Menlo Park Roadway ADT Analysis

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Type</th>
<th>Segment</th>
<th>No Build</th>
<th>With SUMC</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsh Road</td>
<td>Minor Arterial</td>
<td>West of US 101</td>
<td>39,454</td>
<td>39,901</td>
<td>Y</td>
</tr>
<tr>
<td>Sand Hill Road</td>
<td>Minor Arterial</td>
<td>East of Santa Cruz Avenue</td>
<td>33,407</td>
<td>35,374</td>
<td>Y</td>
</tr>
<tr>
<td>Willow Road</td>
<td>Minor Arterial</td>
<td>East of Middlefield Road</td>
<td>23,823</td>
<td>24,904</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>Collector</td>
<td>West of Middlefield Road</td>
<td>6315</td>
<td>6315</td>
<td>N</td>
</tr>
<tr>
<td>Alpine Road</td>
<td>Minor Arterial</td>
<td>West of Junipero Serra Boulevard</td>
<td>25,120</td>
<td>25,634</td>
<td>Y</td>
</tr>
<tr>
<td>Middlefield Road</td>
<td>Minor Arterial</td>
<td>North of Ravenswood Avenue</td>
<td>14,359</td>
<td>14,652</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Minor Arterial</td>
<td>South of Ravenswood Avenue</td>
<td>25215</td>
<td>25268</td>
<td>N</td>
</tr>
<tr>
<td>Ravenswood Avenue</td>
<td>Minor Arterial</td>
<td>East of El Camino Real</td>
<td>22,705</td>
<td>23,038</td>
<td>Y</td>
</tr>
<tr>
<td>Santa Cruz Avenue</td>
<td>Minor Arterial</td>
<td>West of El Camino Real</td>
<td>6,530</td>
<td>6,530</td>
<td>N</td>
</tr>
<tr>
<td>Valparaiso Avenue</td>
<td>Minor Arterial</td>
<td>West of El Camino Real</td>
<td>16,239</td>
<td>16,306</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 3.4-22
2025 Roadway ADT Analysis, with Enhanced TDM and Additional Undercrossings (Menlo Park)

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Type</th>
<th>Segment</th>
<th>No Build</th>
<th>With SUMC</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marsh Road</td>
<td>Minor Arterial</td>
<td>West of US 101</td>
<td>39454</td>
<td>39581</td>
<td>Y</td>
</tr>
<tr>
<td>Sand Hill Road</td>
<td>Minor Arterial</td>
<td>East of Santa Cruz Avenue</td>
<td>33407</td>
<td>33947</td>
<td>Y</td>
</tr>
<tr>
<td>Willow Road</td>
<td>Minor Arterial</td>
<td>East of Middlefield Road</td>
<td>23823</td>
<td>24130</td>
<td>Y</td>
</tr>
<tr>
<td>Alpine Road</td>
<td>Minor Arterial</td>
<td>West of Junipero Serra Boulevard</td>
<td>25120</td>
<td>25260</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>Collector</td>
<td>West of Middlefield Road</td>
<td>6315</td>
<td>6315</td>
<td>N</td>
</tr>
<tr>
<td>Middlefield Road</td>
<td>Minor Arterial</td>
<td>North of Ravenswood Avenue</td>
<td>14359</td>
<td>14439</td>
<td>N</td>
</tr>
<tr>
<td>Ravenswood Avenue</td>
<td>Minor Arterial</td>
<td>South of Ravenswood Avenue</td>
<td>25215</td>
<td>24728</td>
<td>N</td>
</tr>
<tr>
<td>Santa Cruz Avenue</td>
<td>Minor Arterial</td>
<td>East of El Camino Real</td>
<td>22705</td>
<td>22316</td>
<td>N</td>
</tr>
<tr>
<td>Valparaiso Avenue</td>
<td>Minor Arterial</td>
<td>West of El Camino Real</td>
<td>6530</td>
<td>6530</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Minor Arterial</td>
<td>West of El Camino Real</td>
<td>16239</td>
<td>16253</td>
<td>N</td>
</tr>
</tbody>
</table>


Assumptions:
No build - both peaks = 20% of daily traffic
Project only - both peaks = 15% of daily traffic. This rate was determined based on peak hour trip and daily trip ratio of SUMC land uses.

TR-4. Local Circulation Impacts. The SUMC Project could result in significant traffic impact to the local circulation network in the immediate vicinity of the SUMC Sites. (S)

The local circulation network would be enhanced by the SUMC Project. Capacity improvements would be made to Welch Road and to Pasteur Drive, as previously described. Durand Way would also be extended, between Sand Hill Road and Welch Road.

However, the traffic projections for Welch Road indicate that it would be approaching capacity. Future traffic volumes are projected at 14,750 vehicles per day, which is approaching the capacity of a two-lane roadway with a continuous two way left turn lane in the median. The traffic volumes projected for Welch Road, combined with the numerous turning vehicles, pedestrian movements across and along Welch Road, and bicycle travel along Welch Road, would potentially create a safety hazard, which would be a significant impact.

Due to the shortness of the link, there is also the possibility that the queue to make the westbound left turn from Durand Way to Sand Hill Road would back up all the way to the intersection of Welch Road and Durand Way. This would also be a significant impact.

Mitigation Measures. Mitigation Measure TR-4.1, involving funding and implementation of a traffic impact study, and Mitigation Measure TR-4.2, involving re-striping of Durand Way, would reduce the SUMC Project’s impact to a less-than-significant level. (LTS)
**TR-4.1 Fund Traffic Impact Study.** Upon construction of the SHC and LPCH hospital components, the SUMC Project sponsors shall fund an independent traffic evaluation, commissioned by the City, based on actual travel patterns, volumes and emergency access, with an emphasis on ease of circulation around and through the medical complex to determine if the private street connection between Roth Way and Pasteur Drive should be operated as a public street. If the independent traffic study demonstrates that the connection between Roth Way and Pasteur Drive as a public street would improve circulation, then the connection shall be designated as a public street for all vehicular, bicycle, pedestrian, and transit traffic.

**TR-4.2 Fund Signing and Striping Plan and Signal Optimization.** In addition to paying for the construction of the extension of Durand Way from Sand Hill Road to Welch Road, the SUMC Project sponsors shall also pay for the following improvements to ensure that queues from the Durand Way/Sand Hill Road intersection do not spillback onto the Durand Way/Welch Road intersection.

- A signing and striping plan for the Durand Way extension, which would maximize the storage capacity by creating a four-lane roadway with a left and through/right at Sand Hill Road and a right and through/left at Welch Road;
- The installation and optimization of the two signals at the intersections of Durand Way/Sand Hill Road and Durand Way/Welch Road.

**TR-5. Freeway Impacts.** The SUMC Project would result in less-than-significant impacts on freeways. (LTS)

The VTA, the designated CMA for Santa Clara County, has established a threshold of one percent of freeway capacity as a trigger for requiring freeway level of service analysis. As shown in Table 3.4-23, the impacts of the SUMC Project would not contribute sufficient traffic to US 101 or I-280 to require this analysis to be conducted. The individual impact of the SUMC Project would not exceed the level of service standards established by the County CMA for designated highways. As such, the SUMC Project would have a less-than-significant impact on freeways.

**TR-6. Bicycle and Pedestrian Impacts.** The SUMC Project could impede the development or function of planned bicycle or pedestrian facilities, and result in a significant impact. (S)

The Study Area is conducive to bicycle and pedestrian travel, and an extensive bicycle and pedestrian network currently exists around SUMC sites. Figure 3.4-10 shows the Primary Bicycle and Pedestrian Circulation as currently proposed. Bicycle and pedestrian facilities are extant on nearly all streets in the areas surrounding the SUMC Sites. There are also numerous off-road pedestrian-only as well as combined bicycle and pedestrian facilities.
### Table 3.4-23
2025 with SUMC Project Freeway Analysis

<table>
<thead>
<tr>
<th>Freeway</th>
<th>Freeway Segment</th>
<th>Direction</th>
<th>No of Mixed Lanes</th>
<th>Peak Period</th>
<th>Total Capacity</th>
<th>Total Project Trips</th>
<th>Project Trips w HOV Adj</th>
<th>Percent Capacity Added with HOV Adj</th>
<th>Analysis Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 101</td>
<td>University Ave to Willow Road</td>
<td>NB</td>
<td>3</td>
<td>AM PM</td>
<td>6900</td>
<td>3 2</td>
<td>0.03% 0.11%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>US 101</td>
<td>University Ave to Willow Road</td>
<td>SB</td>
<td>3</td>
<td>AM PM</td>
<td>6900</td>
<td>10 8</td>
<td>0.11% 0.04%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>US 101</td>
<td>University Ave to Embarcadero/Oregon Expressway</td>
<td>NB</td>
<td>3</td>
<td>AM PM</td>
<td>6900</td>
<td>27 20</td>
<td>0.30% No</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>US 101</td>
<td>University Ave to Embarcadero/Oregon Expressway</td>
<td>SB</td>
<td>3</td>
<td>AM PM</td>
<td>6900</td>
<td>9 7</td>
<td>0.10% 0.28%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>US 101</td>
<td>Embarcadero/Oregon Expressway to San Antonio Road</td>
<td>NB</td>
<td>3</td>
<td>AM PM</td>
<td>6900</td>
<td>82 61</td>
<td>0.89% 0.32%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>US 101</td>
<td>Embarcadero/Oregon Expressway to San Antonio Road</td>
<td>SB</td>
<td>3</td>
<td>AM PM</td>
<td>6900</td>
<td>26 20</td>
<td>0.28% No</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>I-280</td>
<td>Sand Hill Road to Woodside Road</td>
<td>NB</td>
<td>4</td>
<td>AM PM</td>
<td>9200</td>
<td>18 53</td>
<td>NA 0.58%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>I-280</td>
<td>Sand Hill Road to Woodside Road</td>
<td>SB</td>
<td>4</td>
<td>AM PM</td>
<td>9200</td>
<td>57 20</td>
<td>NA 0.62%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>I-280</td>
<td>Alpine Road to Page Mill Road</td>
<td>NB</td>
<td>4</td>
<td>AM PM</td>
<td>9200</td>
<td>27 10</td>
<td>NA 0.29%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>I-280</td>
<td>Alpine Road to Page Mill Road</td>
<td>SB</td>
<td>4</td>
<td>AM PM</td>
<td>9200</td>
<td>6 25</td>
<td>NA 0.11%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>I-280</td>
<td>Page Mill Road to El Monte Ave</td>
<td>NB</td>
<td>4</td>
<td>AM PM</td>
<td>9200</td>
<td>48 17</td>
<td>NA 0.52%</td>
<td>No No</td>
<td>No No</td>
</tr>
<tr>
<td>I-280</td>
<td>Page Mill Road to El Monte Ave</td>
<td>SB</td>
<td>4</td>
<td>AM PM</td>
<td>9200</td>
<td>15 45</td>
<td>NA 0.16%</td>
<td>No No</td>
<td>No No</td>
</tr>
</tbody>
</table>

FIGURE 3.4-10
SUMC Project Future Bicycle and Pedestrian Facilities

Source: Stanford University Land Use & Environmental Planning, 2008
The SUMC Project would increase on-site employment and visitorship. Given the bicycle and pedestrian network surrounding the SUMC Sites, and the proximity of the SUMC Sites to residential areas, the Stanford Shopping Center, PAITS, and other transit facilities, the SUMC Project would result in increased bicycle and pedestrian activity in and around the SUMC Sites. Also, as explained under Impact TR-2, the SUMC Project would generate 10,061 daily trips. An increase in bicycle and pedestrian travel, and traffic volumes, plus the associated intersection congestion caused by higher traffic levels, could result in increased traffic-related hazards to pedestrians and cyclists. An increase in traffic-related hazards would be a significant impact according to the City’s significance criteria.

MITIGATION MEASURES. A combination of Mitigation Measure TR-2.3 involving trip-reducing measures, plus Mitigation Measure TR-6.1, which involves several bicycle and pedestrian improvements, would reduce the SUMC Project’s impact to a less-than-significant level. The improved facilities would mitigate the hazards to pedestrians and bicyclists brought about by the increased vehicular traffic and congestion. (LTS)

TR-6.1 Bicycle and Pedestrian Infrastructure Improvements. The SUMC Project sponsors shall fund the expansion and improvement of the bicycle and pedestrian network in the immediate vicinity of the SUMC Project. The intent of these improvements is to:

- reduce auto related traffic by providing the infrastructure for alternative travel modes;
- improve the bicycle and pedestrian linkages between the SUMC Project and Downtown Palo Alto, and between the SUMC Project and the surrounding residential neighborhoods; and
- mitigate the safety hazards to pedestrians and cyclists that would result from the SUMC Project related increase in vehicular traffic and congestion.

The specific improvements to be funded by the SUMC Project sponsors shall include the following:

- Provide an enhanced pedestrian crossing at Quarry Road/El Camino Real to establish a strong connection between the SUMC Project and Downtown Palo Alto. The pedestrian crossing shall be 12 feet wide, have contrasting pavement, countdown signal heads, and high visibility markings. Even though the intersection of Quarry Road and El Camino Real is projected to operate at acceptable levels of service, added vehicular traffic through the intersection and added bicycle and pedestrian volumes across the intersection would potentially create safety hazards which would be mitigated by the proposed enhanced crossings.

- Create a bicycle and pedestrian connection between the Stanford Shopping Center and SUMC. The connection shall provide an alternative route to Quarry Road, which is auto dominated. This connection shall extend
between Vineyard Lane and Welch Road. Pedestrian traffic signals and crosswalks shall be placed at the crossing of Vineyard Lane and Welch Road. The crosswalk shall be enhanced either by striping or by the use of contrasting paving.

- Provide a connection from the planned Everett Avenue bicycle and pedestrian undercrossing to the El Camino Real/Quarry Road intersection. Once the tunnel is completed, this linkage shall provide a direct connection between the SUMC Project and Downtown North.

- Provide a bicycle and pedestrian trail through the Arboretum Drive as part of future campus planning in the SUMC area. This trail shall improve access to the SUMC Project. To support this off-street path, bicycle and pedestrian crossings at Arboretum Road and Palo Road shall be enhanced to provide safe crossing of these streets. The crosswalks shall be properly signed, marked, and lighted with enhanced pavement markings and imbedded crosswalk lights. Signalization of this crossing may ultimately be required.

- Incorporate into the Quarry Road corridor, from El Camino Real to Welch Road, continuous sidewalks according to the SUMC Project’s Design Guidelines. The extension of Quarry Road west of Welch Road shall continue the pedestrian facilities into the SUMC Project.

- Enhance all signalized intersections in the Project vicinity, particularly along Quarry Road, Vineyard, and Welch Roads to include 12-foot pedestrian crosswalks on all legs, with textured or colored paving or diagonal or longitudinal zebra striping as determined by the City, pedestrian push buttons and countdown pedestrian signal heads, and other specific improvements that are determined as necessary during the design process, such as median refuge islands, advanced signing, flashing beacons, in-pavement lighting, etc.

- Install the appropriate number of Class I and Class III bicycle parking spaces as required by the City’s Zoning Ordinance for the total amount of existing and future development. The SUMC Project sponsors shall install the required number of bicycle parking spaces equally distributed throughout the SUMC Sites.

**TR-7. Transit Impacts.** Implementation of the SUMC Project could impede the operation of the transit system as a result of increased ridership, and result in a significant impact. (S)

The SUMC Project vicinity is currently served by the Marguerite shuttles that connect to the Palo Alto and California Avenue Caltrain stations. Other transit service to the Caltrain Stations and the Stanford Shopping Center that provide connecting service to the Marguerites include SamTrans Routes RX, 280, 281, 297, 390, 397 and KX; VTA Routes 22, 35, 89 and 522; the U Line from the East Bay; and the Palo Alto shuttles.
The SUMC Project would increase on-site employment by 2,242 full-time equivalent employees and would also increase visitorship. The resulting increase in ridership could exceed capacity in the various transit services to and from the SUMC Sites. As such, the SUMC Project could result in a significant impact on transit.

**Impacts of Mitigation Measure TR-2.3, Involving Provision of the Caltrain GO Pass to SUMC Employees.** The use of transit as a primary means of access to SUMC is expected to increase, particularly with the potential implementation of the GO Pass or equivalent TDM Measure for SUMC employees. The analysis below addresses transit implication of providing the GO Pass or equivalent TDM Measure to SUMC employees.

The current transit mode split for hospital employees is 8.9 percent. This includes ridership on Marguerite shuttles, SamTrans, AC Transit and VTA buses, and Caltrain. Currently, approximately 3.6 percent of SUMC employees use Caltrain to commute to work. On a typical work day this equates to approximately 305 daily inbound and outbound trips. Most of these trips occur during the AM and PM Peak Hours and use the Marguerite shuttle to travel between the SUMC and PAITS.

Providing GO Passes (or equivalent TDM Measure) for SUMC employees is expected to result in the following impacts:

- The mode split for transit is expected to increase to 21.1 percent. Up to 165 AM and 170 PM Peak Hour transit trips would be created by the SUMC Project, depending on the success of the GO Pass.
- Increase the percentage of SUMC employees that commute by Caltrain to approximately 15.8 percent or more. In terms of the number of actual transit trips, this would translate to approximately 1,340 inbound and outbound Caltrain trips per day, which would be an increase of 1,035 riders.
- Increase ridership on the Marguerite shuttles, most notably Line A and Line B Counter-Clockwise. Increased ridership on these two routes could cause a load factor of greater than 1.25. This level of projected transit ridership is considered to be beyond the ability of the current Marguerite shuttle stops to adequately accommodate. This would be considered a significant impact.
- Assuming parking spaces in the expanded Ardenwood park-and-ride lot are made available to SUMC employees, then ridership on the U Line from the East Bay is also expected to increase. The current load factor on the U Line from the East Bay is approaching 1.0 (0.94 according to AC Transit). The expanded ridership could push the load factor above 1.0. A load factor on the U Line greater than 1.0 would be considered a significant impact.

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13 AC Transit, communication with AECOM Transportation, 2009.
• The increase in transit ridership could be a significant impact without facility improvements that accommodate several bus routes simultaneously and also provide queuing areas for the passengers. Traffic volume increases caused by SUMC Project-generated traffic would be a significant impact.

MITIGATION MEASURES. The mitigation of the SUMC Project’s transit impacts involves two measures. First, the SUMC Project’s site plan needs to be modified to include the addition of mini transit centers. Second, additional transit service needs to be provided to meet the projected increase in demand.

Transit Centers. The projected increase in transit ridership would require the addition of mini-transit centers to the project design. These transit centers would be located at Hoover Pavilion and at SHC and would be off-street facilities. The transit centers would accommodate three to four buses simultaneously, have shelters, seating, lighting, signs, maps, bus schedules, and bicycle parking. On-street bus stops along Welch Road and Quarry Road would also be provided, but the transit centers would accommodate the majority of transit riders and would be located to maximize the convenience of employees, patients and visitors. One transit center in the vicinity of Welch Road and Pasteur Drive to serve SHC and another near the entrance to Hoover Pavilion would provide the focal point for transit use for SUMC. Stanford shall revise their SUMC site plan to incorporate two transit hubs as noted above to reduce the impact to transit service caused by the proposed expansion.

Expand Transit Service. The Marguerite, Crosstown, and Menlo Park Shuttle services and the VTA Community Bus service would need to be expanded to meet the projected increase in demand. In some cases, additional capacity would need to be provided, in the form of new routes, or additional buses and higher frequencies on existing routes.

• Marguerite Shuttle. The SUMC Project sponsors shall expand the Stanford University Marguerite shuttle service into Palo Alto. Specifically, Marguerite shuttles shall connect the SUMC to downtown Palo Alto and the areas surrounding the downtown. Currently, Marguerite shuttle routes A and B do not extend into downtown Palo Alto. While the Marguerite shuttle DT and M routes do extend into downtown areas, they do not operate during the majority of the day. This expanded shuttle service could follow new routes or an extension of existing routes. Current headways on existing routes shall be maintained with the expansion.

• U Line. Arrangements with AC Transit shall be made to increase U Line service (such as decreasing headways) to meet the increase in demand attributable to the SUMC Project, and ensure that load factors remain below 1.0. Ridership on the U Line would need to be monitored to ensure that load factors remain below 1.0.
• **Crosstown Shuttle.** The City of Palo Alto currently operates the Crosstown Shuttle. More efficient transit service may be provided by providing this service as a part of the Marguerite Shuttle. SUMC should participate in operating the Palo Alto Crosstown Shuttle service.

• **VTA Community Bus Service.** In 2007, the VTA adopted a new Bus Service Operating Plan which made major modifications to the current bus transit network. The plan introduced Community Bus Service throughout Santa Clara County, which features smaller vehicles with an identity tied to the individual communities served. As a part of that plan, local communities are required to cover 25 percent of the cost if they want to have the service free of charge to the riders.

• **Menlo Park Shuttle Bus.** SUMC should contribute to additional shuttle bus service to Menlo Park, as a means of mitigating the increase in daily traffic on minor arterials and collector streets in the City.

Mitigation Measure TR-7.1 involves the addition of transit centers to the SUMC Project’s site plans, and Mitigation Measure TR-7.2 involves financial contributions towards the expansion of transit service. Implementation of these measures would reduce the SUMC Project’s transit impacts to a less-than-significant level. (LTS)

**TR-7.1 Incorporate Transit Centers Into Site Plans.** The SUMC Project sponsors shall revise their SUMC Project site plan to incorporate two transit centers to reduce the impact to transit service caused by the SUMC Project. These transit centers shall be located at Hoover Pavilion and at SHC, and shall be off-street facilities. The transit centers shall accommodate three to four buses simultaneously, and shall have shelters, seating, lighting, signs, maps, bus schedules, and bicycle parking. On-street bus stops along Welch Road and Quarry Road shall also be provided, but the transit centers shall accommodate the majority of transit riders and shall be located to maximize the convenience of employees, patients, and visitors. One transit center shall be located in the vicinity of Welch Road and Pasteur Drive to serve SHC. The other transit center shall be located near the entrance to Hoover Pavilion. Both of these transit centers shall provide the focal point for transit use for the SUMC.

**TR-7.2 Provide Expanded Transit Service.** The SUMC Project sponsors shall make a fair share financial contribution to the cost of expanding existing bus service of the Marguerite, Crosstown, and Menlo Park Shuttle bus services, and to the VTA Community Bus Service.

• **Marguerite Shuttle.** The SUMC Project sponsors shall make a financial contribution to expand the Marguerite shuttle service into Palo Alto.

• **U Line.** The SUMC Project sponsors shall make a financial contribution towards the operation of the U Line. Arrangements with AC Transit shall be...
made to increase U Line service (such as decreasing headways) to meet the increase in demand attributable to the SUMC Project, and ensure that load factors remain below 1.0.

- **Crosstown Shuttle.** The SUMC Project sponsors shall participate in operating the Palo Alto Crosstown Shuttle service, by contributing to the Citywide Traffic Impact Fee, which would include covering the costs of this service. Then current fee is $2,861 per net new PM Peak Hour trips. A portion of Stanford’s Citywide Traffic Impact Fee shall be used by the City to expand City shuttle services.

- **VTA Community Bus Service.** The SUMC Project sponsors shall contribute to fund the project’s fair share of Palo Alto’s share of expanded VTA Community Bus Service.

- **Menlo Park Shuttle Bus.** The SUMC Project sponsors shall pay into the City of Menlo Park shuttle fee at $0.105 per square foot of new development annually or a percentage agreed between Menlo Park and SUMC Project sponsors. In Menlo Park, the contribution shall be tied to the amount of project traffic added to analyzed roadway segments and intersections.

**TR-8. Parking Impacts.** The SUMC Project would provide adequate parking for its demand, and would thus have a less-than-significant parking impact. (LTS)

The expansions under SUMC Project would include the SHC Hospital, the LPCH, and medical office/clinic buildings. Details of the parking evaluation are presented in the Transportation Impact Analysis in Appendix C.

Table 3.4-24 presents the expected SUMC Project parking demand based on the square footage for 2025. Using the parking demand rate determined through the survey conducted on existing parking conditions, 1,522 spaces would be needed for the hospitals in 2025. Taking into account a 10-percent supply buffer to ensure that drivers are able to locate parking spaces without excessive re-circulating through the parking area, the parking demand at the hospitals is calculated to be 1,674 spaces. Taking away spaces available from current vacancies, new parking spaces needed for the hospitals would be 1,416 in 2025. Parking demand has also been calculated using the City’s zoning ordinance and using Parking Generation, a national publication of ITE. The City’s Zoning ordinance estimates parking demand similar to that based on surveying existing uses; approximately three percent lower. ITE estimates parking considerably higher because of the high rates for hospital parking per bed.
<table>
<thead>
<tr>
<th>Land Use</th>
<th>Size</th>
<th>Parking Demand Rate</th>
<th>Parking Demand</th>
<th>Size</th>
<th>Parking Demand Rate</th>
<th>Parking Demand</th>
<th>Parking Demand Rate</th>
<th>Parking Demand</th>
<th>Parking Demand Rate</th>
<th>Parking Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals (LPCH + SHC)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>248 beds</td>
<td>0.67 spaces per bed</td>
<td>166 spaces</td>
<td>4.72 spaces per bed</td>
<td>1,171 spaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinics (LPCH + SHC)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>365.7 ksf</td>
<td>4.0 spaces per 1.0 ksf</td>
<td>1,463 spaces</td>
<td>3.53 spaces per ksf</td>
<td>1,291 spaces</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>854.970 ksf</td>
<td>1.78 spaces per ksf</td>
<td>1,522 spaces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,462 spaces</td>
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<td></td>
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<tr>
<td>Recommended New Parking Supply (Demand + 10%)</td>
<td>1,674 spaces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spaces available from current vacancies</td>
<td>(258 spaces)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(258 spaces)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended New Parking Supply</td>
<td>1,416 spaces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,204 spaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoover Pavilion Site- New + re-use</td>
<td>144.230 ksf</td>
<td>4.0 spaces per ksf</td>
<td>577 spaces</td>
<td>144.230 ksf</td>
<td>4.0 spaces per ksf</td>
<td>577 spaces</td>
<td>3.53 spaces per ksf</td>
<td>509 spaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recommended New Parking Supply (Demand + 10%)</td>
<td>635 spaces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Recommended New Parking Supply</td>
<td>2,051 spaces</td>
<td></td>
<td>1,948 spaces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2,713 spaces</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Notes: ksf = 1,000 square feet
a. Parking demand based on estimated AM Peak Hour rate from data collection. The AM Peak Hour parking rate is slightly higher than the PM Peak Hour parking rate.
b. Parking supply is based on City Zoning Ordinance October 2007.
c. Parking demand rates from ITE Parking Generation 3rd edition (Land Use 610 and 720).
d. Total clinic area (square feet) = 315,700 (SHC) + 50,000 (LPCH).
e. 10% vacancy factor not applied to City supply requirements or ITE demand.
f. Parking supply increases the parking demand by 10 percent to ensure drivers are able to locate the parking space without re-circulating through the parking area.
g. Fehr & Peers analysis summarizes the parking areas with existing vacancies. These areas are included: L-7, L-13, S-4.
For the medical office/clinic space, 577 spaces would be needed to meet the parking demand in 2025. Similarly, taking into account a 10-percent supply buffer to ensure that drivers are able to locate parking spaces without excessive re-circulating through the parking area, the parking demand for the medical office/clinic space would be 635 spaces. The City’s Zoning ordinance estimates the medical office/clinic parking at 577 spaces, but does not include a 10 percent buffer. Parking Generation estimates the medical office/clinic parking demand at 509 spaces.

As shown in Table 3.4-25, the total new demand for the SUMC Project would be 2,051 parking spaces in 2025. There would also be a need to replace the 932 spaces that would be demolished during project construction. The total demand would therefore be the 2,051 new spaces plus the 932 replacement spaces, which is equal to 2,983 spaces. A total of 2,985 spaces would be supplied, two more than the demand. The 2,985 spaces would be distributed among the four parking structures (SHC, LPCH, Hoover Pavilion, and clinics/medical offices) as shown at the bottom of Table 3.4-25.

However, these parking supply numbers do not take into account traffic mitigation measures that may be implemented. A reduction in parking due to implementing the Caltrain GO Pass or the provision of remote parking lots may be factored into the final on-site parking supply.

Based on the above analysis, the SUMC Project would have a sufficient amount of parking spaces, based on the City Zoning Ordinance. Existing parking spaces that are demolished would be replaced and additional parking spaces are provided for the expansion. No adjustment to SUMC parking is proposed except for reductions available if other mitigation measures that would reduce on-site parking, such as the GO Pass or remote parking lots, are implemented. The proposed TDM measures, including the GO Pass or an equivalent TDM Measure, would eliminate the need for a total of about 720 parking spaces at SUMC. The remote parking plan would eliminate the need for about 640 parking spaces at SUMC. Therefore, the SUMC Project is anticipated to have a less-than-significant impact on parking.

TR-9. Emergency Access. *Implementation of the SUMC Project could potentially result in inadequate emergency access due to increased congestion, a significant impact.* (S)

Emergency vehicles require access within the Study Area to respond to emergencies and also to access the SUMC emergency room. Travel time by emergency vehicles would increase because of additional traffic congestion associated with the SUMC Project. The City’s significance criteria identify inadequate emergency access as a significant impact. The increased congestion identified in this analysis due to the SUMC Project at Study Area intersections is considered a significant impact. Any intersection significantly impacted in terms of level of service or increase in vehicle delay as shown in Table 3.4-17 is also impacted for emergency vehicle access.
Table 3.4-25
SUMC Parking Inventory Changes with SUMC Project

<table>
<thead>
<tr>
<th></th>
<th>Size</th>
<th>Parking Demand (veh/ksf)</th>
<th>Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NEW DEMAND</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHC</td>
<td>543.900</td>
<td>1.78</td>
<td>968</td>
</tr>
<tr>
<td>LPCH</td>
<td>395.300</td>
<td>1.78</td>
<td>704</td>
</tr>
<tr>
<td>SoM</td>
<td>0.000</td>
<td>1.78</td>
<td>0</td>
</tr>
<tr>
<td>New Hoover MOBs</td>
<td>60.000</td>
<td>4.00</td>
<td>240</td>
</tr>
<tr>
<td>Hoover Pavilion converted to MOB use</td>
<td>84.230</td>
<td>1.78 - 4.00</td>
<td>187</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>2,099</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vacancy Factor (10%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>2,309</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minus Credit for Current Vacancies</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>(258)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,051</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DEMOLISHED OCCUPIED SPACES TO BE REPLACED</strong>&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falk (L-5)</td>
<td></td>
<td></td>
<td>115</td>
</tr>
<tr>
<td>Hoover</td>
<td></td>
<td></td>
<td>85</td>
</tr>
<tr>
<td>Parking Structure 3</td>
<td></td>
<td></td>
<td>671</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>932</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vacancy Factor (10%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>932</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Required New And Replacement Parking</strong></td>
<td></td>
<td></td>
<td>2,983</td>
</tr>
<tr>
<td><strong>PROPOSED PARKING</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SHC Structure</td>
<td></td>
<td></td>
<td>970</td>
</tr>
<tr>
<td>LPCH Structure</td>
<td></td>
<td></td>
<td>430</td>
</tr>
<tr>
<td>Hoover Structure</td>
<td></td>
<td></td>
<td>1,085</td>
</tr>
<tr>
<td>Clinics Structure</td>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,985&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: SUMC, 2010.*

*Notes:*

a. Use of existing vacancies in Palo Alto SUMC lots to help meet new demand.

b. Spaces at 1101, 701, and 703 Welch would be demolished but they are not currently included in the SUMC parking inventory, so they are not included in these calculations. Demolished spaces refer to those spaces currently in the mid-morning period that are being removed that would be replaced in number.

c. During the design phase, the parking structure numbers would be fine tuned to meet the total required new parking.

d. Includes 2,053 spaces for the SUMC expansion and 932 replacement spaces for existing spaces to be demolished.
**Mitigation Measures.** Mitigation Measure TR-9.1 involves the installation of emergency vehicle traffic signal priority (OptiCom) at all intersections significantly impacted by the SUMC Project. Implementation of this measure would reduce the SUMC Project’s impact to less-than-significant levels. (LTS)

**TR-9.1 Pay Fair Share Towards OptiCom Installation.** The SUMC Project sponsors shall pay their fair-share financial contribution towards the City of Palo Alto, to assist with the installation and operation of emergency vehicle traffic signal priority (OptiCom) at all significantly impacted intersections.

**Cumulative Analysis**

LOS impacts under the project-level analysis above already account for cumulative growth through 2025 because this growth has been incorporated in the City of Palo Alto Travel Demand Forecasting Model. This growth is also accounted for in the project-level analysis of pedestrian, and emergency access impact. Those analyses that incorporate cumulative growth in the City of Palo Alto Travel Demand Forecasting Model are already capture a cumulative analysis, and no further cumulative discussions for those topics are provided here. Parking impacts are site-specific and do not cumulate with other projects. As such, the only transportation-related impacts to which a cumulative analysis applies are construction-period transportation impacts and transit impacts. The geographic context for the analysis of cumulative construction-period transportation impacts is the Study Area. The geographic context for the analysis of cumulative transit impacts are the service areas of the major transit services serving the SUMC Sites; these areas generally include San Mateo County and Santa Clara County.

**TR-10. Cumulative Construction Impacts.** The SUMC Project, in combination with concurrent construction projects in the vicinity of the SUMC Sites, could result in a significant construction-period impact. The contribution of the SUMC Project would be cumulatively considerable. (S)

Other projects around SUMC Sites may also be under construction during the time that the SUMC Project is being built. The list of current projects that have been approved for development provides a benchmark of the degree of construction that could occur simultaneously with SUMC Project is provided below. While most of these projects would be completed prior to the construction of the SUMC Project, a similar list of projects could be constructed during the time of the SUMC Project’s construction.

- 657 Alma Street
- 473 Acacia Street
- 260 Homer Street
- 325 Lytton Road
- 49 Wells Road
- 441 Page Mill Road
- 855 El Camino Real
- 195 Page Mill Road
In addition to development in the City, construction on the Stanford University campus would also have a cumulative effect on traffic with construction traffic from the SUMC Project. The following is a list of potential projects that could be under construction on the Stanford University campus, within the jurisdiction of Santa Clara County.

- Li Ka Shing Center for Learning and Knowledge (now-2010)
- Lorry I. Lokey Stem Cell Research Building (now-2010)

Projects on the Science and Engineering Quad that would be under construction are:

- Center for Nanoscale Science and Technology (now-2010)
- Huang Engineering Center (now-2010)
- Bio-engineering/Chemical Engineering (2011-2013)

The listed projects would have construction workers using similar travel routes as SUMC construction workers are those in the downtown area and those along El Camino Real south to Page Mill Road. Small residential and retail projects would not create a large number of construction trips and are not included in the list. Nonetheless, construction traffic associated with the SUMC Project and the list of other foreseeable construction projects could result in a significant cumulative impact because these construction projects would involve movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the construction sites, within generally the same designated truck routes.

The SUMC Project would have a cumulatively considerable contribution to the significant construction-period impact because the SUMC Project would comprise the largest construction efforts in the vicinity.

**MITIGATION MEASURES.** With implementation of Mitigation Measures TR-1.1 through TR-1.9, which involve transportation-related construction management measures, the SUMC Project’s contribution to the significant cumulative construction-period impact would be reduced to less than cumulatively considerable. (LTS)
**TR-11. Cumulative Transit Impacts.**  Cumulative growth would result in a less-than-significant cumulative impact on transit services. (LTS)

The major transit agencies providing service to the SUMC Sites and surrounding area include Caltrain, VTA, SamTrans, and AC Transit. There is also local shuttle service provided by the Cities of Menlo Park and Palo Alto, and Stanford University. As part of their operations, these transit providers adjust service frequencies and distribution of service to meet demand trends. As such, cumulative impacts on transit would be less than significant.