Appendix E

Traffic Impact Analysis

3625 Peterson Way Office Project
Environmental Impact Report

City of Santa Clara

HEXAGON TRANSPORTATION CONSULTANTS, INC.

3625 Peterson Way Office Development

Traffic Impact Analysis

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Executive Summary

This report presents the results of the traffic impact analysis conducted for the proposed 3625 Peterson Way office development in the City of Santa Clara, California. The project site is generally located on the southwest quadrant of the US 101/Bowers Avenue interchange and is bounded by US 101 and Lakeside Drive to the north, Lakeside Drive to the east, Tanner Way to the south, and Peterson Way to the west. The proposed project consists of the construction of two 336,000-square foot (s.f.) office buildings and a four-level above grade parking structure with 15,000 s.f. of amenity space. The proposed office buildings would replace an existing on-site light-industrial buildings totaling approximately 218,375 s.f. Access for the proposed project would be provided via driveway on Peterson Way, Tannery Way, and Lakeside Drive.

Scope of Study

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed development. Although the proposed project is located in the City of Santa Clara, the proposed project also would add traffic to facilities outside of the City of Santa Clara. Thus, the impacts of the project were evaluated following the standards and methodologies set forth by the Cities of Santa Clara, Sunnyvale, and San Jose, and the Santa Clara Valley Transportation Authority (VTA). The VTA administers the County Congestion Management Program (CMP). Since the project is expected to add more than 100 net peak hour vehicle trips, a CMP analysis is necessary, which includes a freeway level of service analysis.

The traffic study includes an analysis of AM and PM peak-hour traffic conditions for 40 intersections and 15 freeway segments (30 directional segments) in the vicinity of the project site. The study intersections were selected based upon the estimated number of project trips through the intersection (10 or more trips per lane per hour) and in coordination with the Cities of Santa Clara and Sunnyvale. The study also includes an analysis of freeway ramps serving the project site as well as transit, bicycle, and pedestrian access.

Project Trip Generation

Project trip estimates are based on trip generation rates obtained from the Institute of Transportation Engineers' (ITE's) *Trip Generation*, Tenth Edition, 2017.

Based on ITE trip generation rates for General Office Building (land use #710), it is estimated that the proposed project would generate 6,906 gross daily trips with 675 trips occurring during the AM peak-hour and 713 trips occurring during the PM peak-hour.

The City's Climate Action Plan states that the project must achieve a minimum 10 percent reduction in vehicle miles travelled through the implementation of a Transportation Demand Management (TDM) program. However, VTA guidelines allow traffic analyses to assume a maximum trip reduction of five percent for a TDM plan with financial incentives. The applicant will submit a TDM plan that complies with the City's requirements prior to the issue of a building occupancy permit. Therefore, the project trip estimates include a five percent trip reduction for TDM.

Existing Land Use

Trip credit for the existing uses on site also was applied to the estimated trips for the proposed project. Based on ITE trip generation rates for General Light Industrial (land use #110), the existing uses on-site were estimated to generate approximately 153 AM peak-hour trips and 138 PM peak-hour trips.

The trip generation estimates for the existing building were verified based on field observations. Field observations conducted at the project site in May 2018 revealed that approximately 225 vehicles were parked on site by 8:45 AM, confirming that the trip generation estimates for the existing uses are adequate and possibly conservative.

The existing site-generated traffic was subtracted from the project traffic estimates to obtain the net increase in traffic associated with the proposed project.

Net Project Trips

After the applicable TDM reduction and subtracting the trips associated with the existing building, the proposed project is estimated to generate 5,477 net new daily vehicle trips, with 488 trips (416 inbound and 72 outbound) occurring during the AM peak-hour and 539 trips (91 inbound and 448 outbound) occurring during the PM peak-hour.

Existing Plus Project Intersection Levels of Service

Table ES-1 summarizes the results of the intersection level of service analysis under existing plus project conditions. The results show that, based on the City of Santa Clara significant intersection level of service impact criteria, the intersection of Lakeside Drive and Augustine Drive (intersection #28) would be impacted by the proposed project under existing plus project conditions.

The improvement necessary to improve intersection level of service conditions to acceptable conditions at this intersection would consist of modification of the westbound approach to include one shared left-and-through and one right-turn lane, the eastbound approach to include one share left-and-through and one shared right-and-through lane, and changing the signal phasing from protected to split phasing in the eastbound/westbound direction. The above improvements would satisfactorily mitigate the project impact under existing plus project conditions.

Background Plus Project Intersection Level of Service Analysis

Table ES-1 summarizes the results of the intersection level of service analysis under background plus project conditions. The results show that seven intersections located within the City of Santa and one intersection located within the City of Sunnyvale would be significantly impacted by the project, according to applicable impact criteria. The proposed improvements to mitigate the project impacts are described below.

Project Impacts

(7) Great America Parkway and Great America Way (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). Improvements to mitigate project impacts at this intersection, which include the addition of a second westbound right-turn lane and a second southbound left-turn lane, have been identified by City Place (and are included under background conditions). However, although the planned improvements are projected to improve operating conditions at the intersection, the intersection is projected to continue to operate deficiently under background conditions. The City Place EIR has identified the above improvements as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

Other possible improvements to mitigate the project impact at this location include the addition of a second northbound left-turn lane. This improvement would require the partial removal of the center median on Great America Parkway (south leg of the intersection), widening of Great America Parkway, and implementation of a second receiving lane on the west leg of the intersection (private driveway). With implementation of this improvement, the intersection level of service is projected to improve to LOS E during the AM peak-hour, reducing the project impact to *less than significant*; however, the intersection would continue to operate unacceptably during the AM peak-hour. However, the widening of Great America Parkway and the west leg of the intersection is not feasible. Therefore, this improvement is not feasible due to right-of-way constraints.

The necessary improvement to improve the intersection's operating conditions to acceptable levels consists of the addition of a fourth southbound through lane. This improvement, however, is not feasible due to right-of-way constraints. Therefore, this project impact would be considered ***significant and unavoidable***.

(8) Great America Parkway and Old Mountain View-Alviso Road (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). Improvements to mitigate project impacts at this intersection, which include the addition of a second eastbound left-turn lane, have been identified by City Place (and are included under background conditions). However, although the planned improvements are projected to improve operating conditions at the intersection, the intersection is projected to continue to operate deficiently under background conditions. The City Place EIR has identified the above improvements as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate southbound right-turn lane. The southbound approach at this location currently consists of one left-turn lane, three through lanes, and an 8-foot wide bike lane/right-turn lane. Implementation of the separate southbound right-turn lane improvement would require the widening of the west side of Great America Parkway (north of Old Mountain View/Alviso Road) by approximately 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane) for a distance of approximately 150 feet. The widening of the west side of Great America Parkway would require partial removal of landscape and the relocation of two traffic signal/utilities cabinets, a light pole, and a traffic signal pole. With implementation of the above improvement, the intersection level of service is projected to improve to an acceptable LOS C during the AM peak-hour, reducing the project impact to ***less than significant***.

(16) Bowers Avenue and Augustine Drive (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). However, the City Place EIR identified no feasible mitigations due to right-of-way restrictions and has determined their impact at this location to be significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a fourth southbound through lane. This improvement, however, would require the widening of Bowers Avenue which is not be feasible due to right-of-way constraints. Therefore, the project impact to this intersection is considered ***significant and unavoidable***.

(17) Bowers Avenue and Scott Boulevard (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second southbound left-turn lane at this intersection as mitigation to their project impact.

With implementation of a second southbound left-turn lane, the intersection is projected to operate at acceptable LOS E during the PM peak-hour under background plus project conditions, however, the intersection would continue to operate at an unacceptable LOS F during the AM peak-hour and the project impact would continue to be significant. Implementation of this improvement would require reducing the outside lane width (which includes a bike lane) to 16 feet, reducing the width of the inner two southbound through lanes from 12 feet to 11 feet, and partial removal of the raised center median to provide a second 10-12-foot left-turn lane.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate northbound right-turn lane, in addition to the second southbound left-turn lane. The northbound approach at this location currently consists of one left-turn lane, two through lanes, one shared through-and-right turn lane, and an 8-foot wide bike lane. Implementation of the separate northbound right-turn lane would require the widening of the east side of Bowers Avenue (south of Scott Boulevard) by a minimum of 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane). The widening of the east side of Bowers Avenue would require right-of-way acquisition and partial removal of landscape and two trees along the east side of Bowers Avenue to accommodate a 5-foot sidewalk on this side of the street, in addition to the separate northbound right-turn lane.

Therefore, the required mitigation of the identified project impact at the intersection will consist of implementation of a separate northbound right-turn lane and a fair-share contribution towards the planned second southbound left-turn lane. With implementation of these improvements, the intersection level of service is projected to improve to acceptable LOS E during both the AM and PM peak hours, reducing the project impact to ***less than significant***.

(21) San Tomas Expressway and Scott Boulevard (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a Tier 1C and a Tier 2 priority improvement (identified below) as mitigation to their project impact.

The addition of a second westbound right-turn lane at this intersection has been identified as a Tier 1C priority improvement in the Comprehensive County Expressway Planning Study 2008 Update, March 2009, and is included in the City of Santa Clara Traffic Mitigation Program, June 2011. The intersection delay would slightly improve (from 93.5 seconds to 92.9 seconds) with implementation of this

improvement, however, the intersection is projected to continue to operate deficiently during the PM peak-hour and the project impact would continue to be significant. Additionally, an interchange has been identified at this intersection as a Tier 2 priority improvement in the Comprehensive County Expressway Planning Study.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards the above short-term (second westbound right-turn lane) and long-term (interchange) improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

(23) San Tomas Expressway and Monroe Street (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a Tier 3 priority improvement (identified below) as mitigation to their project impact.

The addition of a second northbound left-turn lane at this intersection has been identified as a Tier 3 priority improvement in the Comprehensive County Expressway Planning Study Policy Advisory Board 2015 Update, March 23, 2015. Implementation of the above improvement, however, is not projected to improve intersection operating conditions with the project and the project impact would continue to be significant.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a fourth southbound through lane. This improvement, however, would require the widening of San Tomas Expressway, which is not be feasible due to right-of-way constraints, or converting the existing HOV lane to a mixed-flow lane.

Additionally, this intersection is one of seven CMP intersections identified in the Santa Clara Multimodal Improvement Plan. The Multimodal Improvement Plan has determined that localized mitigation for the identified seven CMP facilities is not feasible or would be undesirable in light of other city goals and policies and identifies a set of actions and programs that can be implemented to improve system-wide transportation conditions and air quality in the City of Santa Clara.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards planned improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

(28) Lakeside Drive and Augustine Drive (City of Santa Clara)

Mitigation Measure. The significant impact at this intersection could be satisfactorily mitigated with the modification of the eastbound/westbound approaches of the intersection to include one shared left-and-through and one right-turn lane in the westbound approach and one share left-and-through and one shared right-and-through lane in the eastbound approach. These improvements also would require changing the signal phasing from protected to split phasing in the eastbound/westbound direction. Implementation of the above improvements would improve the intersection's operating conditions to LOS C and D during the AM and PM peak hours, respectively, under background plus project conditions, reducing the project impact to ***less than significant***.

(38) Oakmead Parkway/Corvin Drive and Central Expressway (CMP Intersection)

Mitigation Measure. The significant impact at this intersection could be satisfactorily mitigated with the addition of a second eastbound left-turn lane. Implementation of the above improvements would improve the intersection's operating conditions to LOS E during both peak hours, reducing the project impact to less than significant.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards the above improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

Cumulative Plus Project Intersection Level of Service Analysis

Table ES-1 summarized the results of the intersection level of service analysis under cumulative conditions. The results show that nine intersections located within the City of Santa and one intersection located within the City of Sunnyvale would be significantly impacted by the project, according to applicable impact criteria. The proposed improvements to mitigate the project impacts are described below.

Cumulative Project Impacts

(7) Great America Parkway and Great America Way (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified improvements (described under background conditions and included under background and cumulative conditions) as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

The necessary improvement to improve the intersection's operating conditions to acceptable levels consists of the addition of a fourth southbound through lane. This improvement, however, is not feasible due to right-of-way constraints. Therefore, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

(8) Great America Parkway and Old Mountain View-Alviso Road (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified improvements (described under background conditions and included under background and cumulative conditions) as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate southbound right-turn lane. The southbound approach at this location currently consists of one left-turn lane, three through lanes, and an 8-foot wide bike lane/right-turn lane. Implementation of the separate southbound right-turn lane improvement would require the widening of the west side of Great America Parkway (north of Old Mountain View/Alviso Road) by approximately 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane) for a distance of approximately 150 feet. The widening of the west side of Great America Parkway would require partial removal of landscape and the relocation of two traffic signal/utilities cabinets, a light pole, and a traffic signal pole. With implementation of the above improvement, the intersection level of service is projected to improve to an

acceptable LOS D during the AM peak-hour, reducing the cumulative project impact to ***less than significant***.

(16) Bowers Avenue and Augustine Drive (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). However, the City Place EIR identified no feasible mitigations due to right-of-way restrictions and has determined their impact at this location to be significant and unavoidable.

The necessary improvements to improve the intersection's operating conditions to acceptable levels consists of the widening of Bowers Avenue to include four through lanes (with a separate right-turn lane in the southbound direction) in each the northbound and southbound directions. Implementation of these improvements is not feasible due to right-of-way constraints. Therefore, the cumulative project impact at this intersection is considered to be ***significant and unavoidable***.

(17) Bowers Avenue and Scott Boulevard (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second southbound left-turn lane at this intersection as mitigation to their project impact.

Possible improvements at this location include the addition of a separate northbound right-turn lane, in addition to the second southbound left-turn lane. Implementation of the separate northbound right-turn lane would require the widening of the east side of Bowers Avenue (south of Scott Boulevard) by a minimum of 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane). The widening of the east side of Bowers Avenue would require right-of-way acquisition and partial removal of landscape and two trees along the east side of Bowers Avenue to accommodate a 5-foot sidewalk on this side of the street, in addition to the separate northbound right-turn lane. With implementation of the above improvements (both the southbound left-turn lane and the northbound right-turn lane), the intersection delays is projected to improve to better than no project conditions, reducing the cumulative project impact to less than significant; however, the intersection would continue to operate unacceptably (LOS F).

In order to improve the intersection's operating conditions to acceptable levels, in addition to the above improvements, the addition of a fourth northbound through lane and a separate southbound right-turn lane would be necessary. With these improvements, the intersection level of service is projected to improve to acceptable LOS E during the AM peak-hour. These improvements, however, would require the widening of Bowers Avenue which is not be feasible due to right-of-way constraints. Therefore, the cumulative project impact to this intersection is considered ***significant and unavoidable***.

(21) San Tomas Expressway and Scott Boulevard (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second westbound right-turn lane (Tier 1C priority improvement in the Comprehensive County Expressway Planning Study 2008 Update, March 2009) and implementation of an interchange (Tier 2 priority improvement in the Comprehensive County Expressway Planning Study).

Therefore, mitigation of the identified cumulative project impact at the intersection will consist of a fair-share contribution towards the above short-term (second westbound right-turn lane) and long-term (interchange) improvements. However, since this intersection is located outside of City of Santa Clara

jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

(28) Lakeside Drive and Augustine Drive (City of Santa Clara)

Mitigation Measure. The cumulative project impact at this intersection could be satisfactorily mitigated with the modification of the eastbound/westbound approaches of the intersection to include one shared left-and-through and one right-turn lane in the westbound approach and one share left-and-through and one shared right-and-through lane in the eastbound approach. These improvements also would require changing the signal phasing from protected to split phasing in the eastbound/westbound direction. Implementation of the above improvements would improve the intersection's operating conditions to LOS C and D during the AM and PM peak hours, respectively, under cumulative plus project conditions, reducing the cumulative project impact to ***less than significant***.

(38) Oakmead Parkway/Corvin Drive and Central Expressway (CMP Intersection)

Mitigation Measure. The cumulative project impact at this intersection could be satisfactorily mitigated with the addition of a second eastbound left-turn lane. Implementation of the above improvements would improve the intersection's operating conditions to better than cumulative no project conditions, reducing the project impact to less than significant; however, the intersection would continue to operate at unacceptable LOS F during both peak hours.

The necessary improvements to improve the intersection's operating conditions to acceptable levels consist of the widening of Central Expressway to include three through lanes in each direction. The Central Expressway widening to three lanes in each direction from San Tomas Expressway to Lawrence Expressway is included as a Tier 3 improvement identified in the March 2015 update to the 2008 Countywide Expressway Study. Therefore, mitigation of the identified cumulative project impact at the intersection will consist of a fair-share contribution towards the above improvements.

Since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

Freeway Segment Capacity Analysis

The results of the CMP freeway segment analysis are summarized in Table ES 2. The results show that the proposed project is projected to add traffic volumes representing 1% or more of the freeway capacity to the mixed-flow lanes on 11 directional freeway segments and to the HOV lanes on 7 directional freeway segment that currently operate at LOS F. Based on CMP freeway impact criteria, the following directional freeway segment (mixed-flow and/or HOV lanes) would be impacted by the proposed project.

1. Northbound US 101, from I-880 to Old Bayshore Highway
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
2. Northbound US 101, from Old Bayshore Highway to North First Street
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
3. Northbound US 101, from North First Street to Guadalupe Parkway (SR 87)
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
4. Northbound US 101, from Guadalupe Parkway (SR 87) to De La Cruz Boulevard
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
5. Northbound US 101, from De La Cruz Boulevard to San Tomas/Montague Expressway
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)

6. Northbound US 101, from San Tomas/Montague Expwy to Bowers Ave/Great America Pkwy (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
20. Southbound US 101, from Bowers Ave/Great America Pkwy to San Tomas/Montague Expwy (**Impact:** PM peak-hour – Mixed-flow and HOV lanes)
21. Southbound US 101, from San Tomas/Montague Expressway to De La Cruz Boulevard (**Impact:** PM peak-hour – Mixed-flow lanes)
23. Southbound US 101, from Guadalupe Parkway (SR 87) to North First Street (**Impact:** PM peak-hour – Mixed-flow lanes)
24. Southbound US 101, from North First Street to Old Bayshore Highway (**Impact:** PM peak-hour – Mixed-flow lanes)
25. Southbound US 101, from Old Bayshore Highway to I-880 (**Impact:** PM peak-hour – Mixed-flow lanes)

Full mitigation of significant project impacts on freeway segments would require roadway freeway widening to construct additional through lanes, thereby increasing freeway capacity. The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along US 101, between Whipple Avenue in San Mateo County and Cochrane Road in Morgan Hill (VTP ID: H2), which includes the impacted freeway segments. The express lane projects on US 101 consist of the conversion of approximately 34 miles of existing High Occupancy Vehicle (HOV or carpool) lanes to express lanes and adding a second express lane for a total of two express lanes in each direction. However, converting the HOV lanes to express lanes would not mitigate the project impacts. Therefore, the significant impacts on the directional freeway segments identified above must be considered significant and unavoidable.

Both VTA and Caltrans have encouraged local agencies to collect "voluntary contributions" to be used toward improvement of the regional freeway system. Therefore, the project may be required to make a fair-share contribution toward the cost of the US 101 express lane project. The amount of the contribution, if required, would be negotiated with the City of Santa Clara.

Unsignalized Intersection Analysis (Traffic Signal Warrants)

The unsignalized study intersections of Peterson Way/Lakeside Drive and Peterson Way/Tannery Way were analyzed for operational purposes. Unsignalized intersections are analyzed on the basis of the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the California *Manual on Uniform Traffic Control Devices* (MUTCD), 2014 Edition.

The results of the peak-hour traffic signal warrant checks indicate that both of the unsignalized study intersections are projected to have traffic volumes that fall below the thresholds that warrant signalization under background plus project and cumulative plus project conditions.

Other Transportation Issues

Site Access Evaluation

Vehicular access to the project site would be provided via two driveways along Peterson Way, two driveways along Tannery Way, and one driveway along Lakeside Drive. All project driveways would provide full access to/from the project site.

All project driveways, with the exception of Driveway 3 along Tannery Way, are shown on the site plan to be 30 feet wide. Driveway 3 on Tannery Way is shown to be 60 feet wide, but includes a landscaped 20-foot center median that separates the 20-foot each inbound and outbound lanes. According to the City of Santa Clara Municipal Code, Chapter 18.74 (Parking Regulations), two-way driveways providing

access to all properties other than residential shall be a minimum width of at least twenty-two (22) feet and a maximum width of 30 feet. Approaches to one-lane driveways may be 20 feet wide. Additionally, the City Code states that any abandoned driveways shall be reconstructed to standard City sidewalk, curb, and gutter requirements, concurrent with the new driveway construction. All existing driveways that are planned to be abandoned must adhere to these City requirements.

The proposed driveways would satisfy City of Santa Clara driveway design standards.

Sight Distance at the Driveways

The posted speed limit along Tannery Way is 25 miles per hour (mph), while the posted speed limit on Lakeside Drive is 35 mph. No speed limit signs are posted along Peterson Way, therefore, it is assumed that this roadway segment has a speed limit of 25 mph. According to the HDM, roadways with a design speed of 25 mph must provide a minimum stopping sight distance of 150 feet, while roadways with design speeds of 35 mph must provide a minimum stopping sight distance of 250 feet.

Both Peterson Way and Tannery Way are long and straight roadways and provide a clear line of sight from all project site driveways. Based on aerial images, a minimum of 400 feet of sight distance is provided at all project site driveways on Peterson and Tannery Ways.

Driveway 5 is located along a curving segment of Lakeside Drive, which results in limited sight distance. Nevertheless, aerial images and field observations show that the required stopping sight distance of 250 feet is currently provided at this driveway, as long as on-street parking along the southside of Lakeside Drive is prohibited for a minimum of 250 feet to the north/west and 100 feet to the south/east (between Driveway 5 and the adjacent driveways). “No Parking” signs are currently posted along this segment of Lakeside Drive and should be maintained in order to provide adequate stopping sight distance at Driveway 5.

Based on the posted speed limits, Caltrans design standards, and the above recommendations, adequate stopping sight distance is and would continue to be provided at all project site driveways.

Emergency Vehicle Access

All proposed project site driveways, with the exception of Driveway 3 on Tannery Way, would provide adequate width for larger vehicle (such as emergency vehicles, delivery trucks, and garbage trucks) to access the project site.

A fire access plan was prepared by Arc Tec, dated March 6, 2018. The fire access plan shows the wheel travel path of a 47-foot long fire truck accessing the site via Driveways 2 (Peterson Way) and 5 (Lakeside Drive) and circulating throughout the site to access all surface parking areas and proposed buildings. The fire access plan also shows that the proposed pedestrian pathway located south of the parking structure also would function as a fire lane, providing emergency vehicle access to the common area located between the buildings and the parking structure.

Based on the driveway widths and proposed fire access plan, emergency vehicle access and circulation throughout the site would be adequate.

Pedestrian Access

Pedestrian pathways are shown throughout the project site, providing a connection between sidewalks on the adjacent streets, the proposed buildings, and other amenities on-site. Additionally, the project is proposing to construct a half-mile walking path along the perimeter of the project site, which would include the sidewalks along Peterson and Tannery Ways. Therefore, pedestrian access to all proposed facilities within the project site would be adequate.

On-Site Circulation

No dead-end aisles are being proposed, eliminating the need for vehicles to complete U-turns within the site. Additionally, all parking areas and parking structure would be connected, allowing drivers to circulate the site without having to enter and exit the site while looking for parking.

Based on the proposed circular layout of the project site, connectivity between all parking areas and parking structure, adequate drive aisle widths and turn radii, on-site vehicular circulation would be adequate.

Pedestrian On-Site Circulation

The site plan shows sidewalks along the project site's frontage on Peterson and Tannery Ways as well as pedestrian pathways throughout the project site, connecting to all on-site facilities and facilitating pedestrian circulation within the site. Additionally, the half-mile trail along the site perimeter would provide pedestrian access to all parts of the project site as well as the opportunity for pedestrians to exercise within the site.

A drop-off area is shown within the first level of the parking structure, along its southern boundary. Vehicles would be able to enter the parking structure via Driveway 1 (Peterson Way), drive through the first drive aisle to access the drop-off area, and continue to exit the site via Driveway 5 (Lakeside Drive). The on-site pedestrian pathways would connect directly to the drop-off area.

Based on the site plan layout and proposed pedestrian facilities, pedestrian access to all proposed facilities within the project site would be adequate.

Recommended Site Access and Circulation Improvements

The following recommendations are made to promote adequate site access and on-site circulation:

Prohibit On-Street Parking Adjacent to Project Driveways. On-street parking must continue to be prohibited adjacent to the project site driveway along Lakeside Drive (Driveway 5) in order to provide the required minimum stopping sight distance of 250 feet at this driveway. Additionally, Hexagon recommends that standard no parking zones be established adjacent to the project driveways on Peterson and Tannery Ways to ensure that exiting vehicles can see pedestrians on the sidewalk, as well as vehicles on the road.

Provide Clear Sight Triangles at Driveways. The project must ensure that any landscaping and signage located adjacent to the project driveways do not obstruct the view for drivers exiting the site.

Design of Project Site. The design of the project site, including but not limited to driveways, sidewalks, drive aisles, turn radii, parking stalls, and signage should adhere to City of Santa Clara design standards.

Parking

Vehicle Parking

The City of Santa Clara Municipal Code (Section 18.74.020) states that office developments are required to provide one space for each three hundred (300) square feet of gross floor area. Based on these standards, the proposed project (676,310 s.f. of office space and 13,370 s.f. amenities building) would be required to provide 2,299 on-site parking spaces.

The site plan lists a total of 2,280 on-site parking spaces being proposed, which is 19 spaces less than the calculated number of spaces above.

Americans With Disabilities Act Compliance

Based on the above ADA requirements and the City of Santa Clara parking requirements, the proposed project must provide a total of 23 accessible parking spaces, with a minimum of 2 of the 23 spaces designated as van accessible spaces. The site plan lists a total of 32 accessible parking spaces (with 6 of them designated as van accessible) being proposed within the project site. Therefore, the proposed number of accessible parking spaces satisfies ADA parking requirements.

Bicycle Parking

Based on VTA's guidelines, the proposed project would be required to provide a total of 115 bicycle parking spaces, with 86 long-term spaces and 29 short-term spaces.

The project proposes 60 short-term bicycle parking spaces and 180 long-term bicycle parking spaces. The proposed number of bicycle parking spaces exceeds the required number of long-term and short-term bicycle parking spaces.

Queuing Analysis

The results of the queuing analysis show that there is inadequate queue storage capacity for seven of the twelve left-turn movements analyzed (six intersections). Intersections projected to have left-turn queue storage deficiencies include:

5. Garrett Drive and Scott Boulevard

The 95th percentile eastbound left-turn queue length at this intersection is projected to exceed the existing capacity under background plus project conditions.

The eastbound left-turn pocket could be extended the additional 50 feet required to serve the projected queue length for this movement by removing a portion of the existing landscaped center median. However, extension of the left-turn pocket would require the removal of a tree located within this portion of the center median.

16. Bowers Avenue and Augustine Drive

The 95th percentile eastbound and northbound left-turn queue lengths at this intersection are projected to exceed the existing capacity under background plus project conditions.

The eastbound left-turn storage cannot be increased because the turn pockets extend the full length of the eastbound approach to the upstream intersection of Lakeside Drive and Augustine Drive. The northbound left-turn pocket could only be extended approximately 100 feet (due to back-to-back left-turn lanes with the southbound left-turn movement at the Bowers Avenue/Scott Boulevard intersection) by removing a portion of the existing landscaped center median. However, extension of the northbound left-turn pocket would require the removal of a several trees located within the center median and the queue storage capacity would continue to be deficient by approximately 50 feet.

18. Bowers Avenue and Central Expressway

The 95th percentile southbound left-turn queue length at this intersection is projected to exceed the existing capacity under background and background plus project conditions.

The southbound left-turn storage cannot be increased due to back-to-back left-turn lanes with the northbound left-turn pocket providing access to the existing land use at the northwest corner of the Bowers Avenue/Central Expressway intersection.

21. San Tomas Expressway and Scott Boulevard

The 95th percentile eastbound left-turn queue length at this intersection is projected to exceed the existing capacity under background and background plus project conditions.

Extending the existing left-turn pockets and providing a third eastbound left-turn lane would be required to accommodate the projected vehicular queue length for this movement. However, due to back-to-back left-turn lanes with the westbound left-turn pocket at the upstream intersection as well as right-of-way constraints along Scott Boulevard, this improvement is not feasible. Alternatively, an interchange also has been identified at this intersection as a Tier 2 priority project in the Comprehensive County Expressway Planning Study.

33. Lawrence Expressway and Oakmead Parkway

The 95th percentile southbound left-turn queue length at this intersection is projected to exceed the existing capacity under background and background plus project conditions.

Extending the existing left-turn pockets and providing a third southbound left-turn lane would be required to accommodate the projected vehicular queue length for this movement. However, due to right-of-way constraints, this improvement is not feasible.

37. Oakmead Parkway and Arques Avenue/Scott Boulevard

The 95th percentile westbound left-turn queue length at this intersection is projected to exceed the existing capacity under background and background plus project conditions.

The westbound left-turn pocket could be extended the additional 100 feet required to serve the projected queue length for this movement by removing a portion of the existing landscaped center median. However, extension of the left-turn pocket would require the removal of several trees located within the center median.

Freeway Ramp Analysis

An analysis of metered freeway on-ramps providing access to the project site was performed to identify the effect of the addition of project traffic on the queues at metered study freeway on-ramps. Additionally, queue lengths at freeway off-ramps serving the project site also were evaluated to determine the adequacy of the freeway off-ramps to serve the projected vehicular queues.

It should be noted that the evaluation of freeway ramps is not required based on the City's transportation impact analysis guidelines, nor are there adopted methodologies and impact criteria for the analysis of freeway ramps.

Metered Freeway On-Ramp Analysis

The proposed project traffic is anticipated to add no more than 5 trips to any of the study metered on-ramp during the AM peak-hour, and approximately 22 and 31 trips to the SR 237 westbound and eastbound on-ramps, respectively, during the PM peak-hour.

It was determined that the following study freeway on-ramps would experience an increase in queue length and wait time as the result of the addition of project traffic:

- SR 237 Westbound On-ramp (AM peak-hour) – increase of one vehicle in the projected vehicle queue length (from 11 to 12 vehicles from background to project conditions) and increase of 5 seconds in the wait time (from 55 seconds to one minute from background to project conditions) at the meter. Project traffic added to this on-ramp represents an increase of less than 1% in the

ramp volume. The estimated vehicle queue length within this metered on-ramp would store within the ramp.

- SR 237 Eastbound On-ramp (PM peak-hour) – increase of four vehicles in the projected vehicle queue length (from 250 to 254 vehicles from background to project conditions) and increase of 22 seconds in the wait time (from 33 minutes 20 seconds to 33 minutes 52 seconds from background to project conditions) at the meter. Project traffic added to this on-ramp represents an increase of approximately 1.6% in the ramp volume. The estimated vehicle queue length within this metered on-ramp would spill out of the ramp and extend onto Great America Parkway.

It should be noted that it is not very likely that a wait time of 30+ minutes at the SR 237 Eastbound On-Ramp would ever be experienced. Most drivers tend to look for alternative routes or different times to travel when long delays at experienced at an intersection or freeway ramp. However, the analysis presents an evaluation to quantify the potential change in delay due to the proposed project.

Project traffic at the remaining study freeway on-ramps is not projected to be sufficient to cause an increase in the projected vehicular queue lengths nor the wait times at the ramps.

Freeway Off-Ramp Analysis

The addition of project traffic to the analyzed freeway off-ramps is projected to increase ramp queue lengths by no more than one vehicle during the peak-hours. The queue length at the US 101 southbound off-ramp at Lawrence Expressway is projected to continue to exceed the ramp's queue storage capacity under project conditions. However, the project traffic would not increase the queue length at this off-ramp.

All other study freeway off-ramps would provide adequate queue storage capacity to serve the projected queue lengths within each ramp.

Potential Impacts on Pedestrians, Bicycles, and Transit

Project's Effect on Pedestrian Facilities

It can be expected that new pedestrian traffic would be generated by the proposed project. The project site is located within what would be considered a walking distance (less than half one mile) from various pedestrian destinations, including restaurants, shopping centers, and bus stops.

With the available sidewalks and crosswalks along roadways and intersections in the vicinity of the project site, adequate pedestrian access to and from the project site to nearby pedestrian destinations would be provided. Therefore, no off-site pedestrian improvements are necessary.

Project's Effect on Bicycle Facilities

The proposed project could increase the demand on bicycle facilities in the vicinity of the project site. Assuming bicycle trips would comprise no more than one percent of the total project-generated trips, the project could generate 6-7 new bicycle trips during the peak hours. The potential demand could be easily served by the various bicycle facilities available in the immediate vicinity of the project site. Therefore, the potential increase in bicycle trips by the proposed project would not have an adverse effect on the existing bicycle facilities in the study area, and would not require new off-site bicycle facilities.

Project's Effect on Transit Services

Due to the proximity of bus stops to the project site, it is assumed that some tenants of the proposed project would utilize the existing transit service. Assuming a commute hour transit mode share of 2 percent (as recommended by VTA guidelines), the project would generate up to 13 new transit riders

during the peak hours. Given that the project site is served by 3 local bus routes, one limited-stop route, and one shuttle, an average of 3-4 new transit riders would access each of the available bus routes during the peak-hours. Therefore, it is anticipated that the projected transit riders associated with the project could be accommodated by the existing transit services.

An evaluation of the effects of project traffic on transit vehicle delay also was completed. The analysis was completed for all transit routes that travel through the study intersections utilizing information presented in the preceding chapter under the intersection Level of Service analysis. The results of the transit delay analysis shows that for most routes, the traffic associated with the proposed project would increase delay to transit vehicles by 89 seconds (less than two minutes) or less per vehicle. The VTA has not established policies or significance criteria related to transit vehicle delay. Thus, this data is presented for informational purposes only.

Table ES 1
Intersection Level of Service Summary

Study Number	Intersection	Jurisdiction	LOS Standard	Peak Hour	Count Date	Existing Avg. Delay	Existing LOS	Existing Plus Project Avg. Delay	Existing Plus Project LOS	Background Avg. Delay	Background LOS	Background Plus Project Avg. Delay	Background Plus Project LOS	Background Plus Project Incr. In Crit. Delay	Background Plus Project Incr. In Crit. V/C	Cumulative Avg. Delay	Cumulative LOS	Cumulative Plus Project Avg. Delay	Cumulative Plus Project LOS	Cumulative Plus Project Incr. In Crit. Delay	Cumulative Plus Project Incr. In Crit. V/C
1	Lawrence Expressway and Kifer Road	Santa Clara	E	AM	03/07/18	35.1	D+	36.1	D+	**99.9**	**F**	**102.2**	**F**	**+3.5**	**0.008**	**120.5**	**F**	**122.9**	**F**	**+3.6**	**0.008**
				PM	03/07/18	**83.9**	**F**	**84.5**	**F**	**128.4**	**F**	**130.6**	**F**	**+3.7**	**0.007**	**144.7**	**F**	**147.0**	**F**	**+3.9**	**0.007**
2	Lawrence Expressway and Monroe Street/Reed Avenue*	Santa Clara	E	AM	03/07/18	**89.2**	**F**	**92.2**	**F**	**134.9**	**F**	**137.5**	**F**	**+3.6**	**0.009**	**152.4**	**F**	**155.0**	**F**	**+3.7**	**0.009**
				PM	10/05/16	74.1	E	75.9	E-	**110.6**	**F**	**112.3**	**F**	**+2.8**	**0.006**	**126.8**	**F**	**128.6**	**F**	**+2.9**	**0.006**
3	Lawrence Expressway and Cabrillo Avenue	Santa Clara	E	AM	03/07/18	40.6	D	41.0	D	**80.6**	**F**	**83.1**	**F**	**+3.5**	**0.006**	**102.8**	**F**	**105.5**	**F**	**+3.6**	**0.006**
				PM	03/07/18	41.4	D	42.0	D	66.6	E	68.8	E	+3.3	0.006	**83.8**	**F**	**86.1**	**F**	**+3.5**	**0.006**
4	Lawrence Expressway and El Camino Real*	Santa Clara	E	AM	03/07/18	31.9	C	32.1	C-	36.2	D+	36.3	D+	+0.3	0.005	38.4	D+	38.5	D+	+0.3	0.005
				PM	11/10/16	29.9	C	29.9	C	33.5	C-	33.5	C-	0.0	0.000	38.7	D+	38.8	D+	0.0	0.000
5	Garrett Drive and Scott Boulevard	Santa Clara	D	AM	08/30/16	7.9	A	10.2	B+	7.8	A	9.8	A	+3.3	0.064	10.0	A	12.2	B	+3.6	0.064
				PM	08/30/16	7.8	A	8.6	A	9.5	A	9.9	A	0.0	0.000	16.5	B	16.5	B	0.0	0.000
6	Lakeside Drive and Scott Boulevard	Santa Clara	D	AM	08/30/16	12.5	B	12.6	B	11.2	B+	11.5	B+	+0.4	0.026	11.3	B+	11.6	B+	+0.6	0.026
				PM	08/30/16	10.9	B+	12.1	B	10.5	B+	11.9	B+	+2.3	0.035	11.3	B+	12.9	B	+2.7	0.035
7	Great America Parkway and Great America Way	Santa Clara	D	AM	01/26/16	22.7	C+	22.3	C+	**96.1**	**F**	**99.8**	**F**	**+5.1**	**0.011**	**111.4**	**F**	**115.2**	**F**	**+5.2**	**0.011**
				PM	01/26/16	15.5	B	15.4	B	33.1	C-	36.7	D+	+5.6	0.012	47.4	D	51.7	D-	+6.7	0.012
8	Great America Parkway and Old Mountain View-Alviso Road	Santa Clara	D	AM	01/26/16	20.9	C+	20.8	C+	**59.3**	**E+**	**63.1**	**E**	**+5.3**	**0.011**	**75.9**	**E-**	**79.8**	**E-**	**+5.4**	**0.011**
				PM	01/26/16	49.3	D	49.3	D	47.2	D	48.5	D	+2.1	0.011	52.9	D-	54.7	D-	+3.0	0.011
9	Great America Parkway and Bunker Hill Lane	Santa Clara	D	AM	01/26/16	18.6	B-	18.1	B-	11.4	B+	11.3	B+	-0.1	0.011	11.9	B+	11.9	B+	0.0	0.011
				PM	01/26/16	32.2	C-	31.9	C	23.3	C	23.3	C	0.0	0.002	24.1	C	24.1	C	0.0	0.002
10	Great America Parkway and Tasman Drive*	Santa Clara	E	AM	03/07/18	42.0	D	42.1	D	46.1	D	46.1	D	+0.1	0.010	51.1	D-	51.3	D-	+0.4	0.010
				PM	11/17/16	29.5	C	29.6	C	52.9	D-	53.3	D-	+0.8	0.003	66.9	E	67.8	E	+1.0	0.003
11	Great America Parkway and Old Glory Lane	Santa Clara	D	AM	01/26/16	10.0	A	9.9	A	17.0	B	17.1	B	+0.2	0.012	19.7	B-	20.1	C+	+0.7	0.012
				PM	01/26/16	14.5	B	14.3	B	41.1	D	41.3	D	+0.2	0.002	54.2	D-	54.5	D-	+0.7	0.002
12	Great America Parkway and Patrick Henry Drive	Santa Clara	D	AM	01/26/16	26.7	C	26.8	C	33.6	C-	34.5	C-	+1.6	0.011	52.4	D-	54.9	D-	+4.4	0.011
				PM	01/26/16	41.2	D	41.0	D	30.1	C	30.0	C	+0.2	0.002	**79.5**	**E-**	**79.7**	**E-**	**+1.0**	**0.002**
13	Great America Parkway and Mission College Boulevard*	Santa Clara	E	AM	03/07/18	42.9	D	42.9	D	48.1	D	48.1	D	+0.1	0.001	63.3	E	63.4	E	+0.4	0.001
				PM	12/06/16	49.0	D	48.9	D	**81.0**	**F**	**81.3**	**F**	**+0.7**	**0.002**	**121.1**	**F**	**122.4**	**F**	**+0.8**	**0.002**
14	Great America Parkway and US 101 Northbound Ramps*	Santa Clara	E	AM	01/26/16	5.8	A	7.6	A	12.9	B	15.5	B	+3.3	0.038	18.4	B-	24.9	C	+9.1	0.038
				PM	11/17/16	8.1	A	8.6	A	22.6	C+	24.8	C	+3.1	0.010	53.2	D-	56.4	E+	+4.7	0.010
15	Bowers Avenue and US 101 Southbound Ramps*	Santa Clara	E	AM	01/26/16	15.7	B	15.8	B	19.0	B-	19.2	B-	+0.1	0.003	24.8	C	25.3	C	+0.4	0.003
				PM	11/17/16	5.6	A	5.5	A	6.5	A	6.5	A	+0.1	0.006	9.6	A	9.7	A	+0.3	0.006
16	Bowers Avenue and Augustine Drive	Santa Clara	D	AM	08/30/16	18.7	B-	18.4	B-	39.9	D	39.7	D	0.0	0.001	47.9	D	48.0	D	0.0	0.001
				PM	08/30/16	26.2	C	28.6	C	**57.5**	**E+**	**72.8**	**E**	**+22.8**	**0.057**	**84.0**	**F**	**104.3**	**F**	**+25.3**	**0.057**
17	Bowers Avenue and Scott Boulevard*	Santa Clara	E	AM	11/07/17	39.5	D	40.1	D	**91.8**	**F**	**100.1**	**F**	**+12.4**	**0.023**	**120.5**	**F**	**129.5**	**F**	**+12.4**	**0.023**
				PM	11/16/16	34.2	C-	34.7	C-	**80.4**	**F**	**84.9**	**F**	**+11.6**	**0.030**	**124.3**	**F**	**130.8**	**F**	**+0.6**	**0.001**
18	Bowers Avenue and Central Expressway*	Santa Clara	E	AM	11/07/17	58.9	E+	59.3	E+	**84.4**	**F**	**84.9**	**F**	**+0.9**	**0.004**	**108.7**	**F**	**109.2**	**F**	**+1.1**	**0.004**
				PM	10/05/16	57.3	E+	57.6	E+	**102.6**	**F**	**104.9**	**F**	**+2.0**	**0.002**	**123.5**	**F**	**126.0**	**F**	**+53.9**	**-0.011**
19	Mission College Boulevard/Thomas Road and Montague Expressway*	Santa Clara	E	AM	11/07/17	**80.7**	**F**	**81.1**	**F**	**176.6**	**F**	**177.8**	**F**	**0.0**	**0.000**	**227.8**	**F**	**229.0**	**F**	**0.0**	**0.000**
				PM	10/04/16	62.9	E	62.9	E	**144.7**	**F**	**153.3**	**F**	**+0.5**	**0.001**	**235.2**	**F**	**236.0**	**F**	**+0.5**	**0.001**
20	Agnew Road/Freedom Circle and Mission College Boulevard	Santa Clara	D	AM	11/29/16	30.2	C	30.3	C	30.8	C	30.9	C	+0.2	0.003	36.5	D+	36.8	D+	+0.4	0.003
				PM	11/29/16	32.7	C-	32.7	C-	35.0	C-	35.1	D+	+0.2	0.003	**57.6**	**E+**	**57.9**	**E+**	**+0.8**	**0.003**
21	San Tomas Expressway and Scott Boulevard*	Santa Clara	E	AM	11/07/17	30.5	C	31.0	C	43.8	D	46.2	D	+8.0	0.025	52.6	D-	55.0	E+	+9.2	0.025
				PM	10/04/16	55.5	E+	56.5	E+	**90.1**	**F**	**93.5**	**F**	**+4.9**	**0.012**	**117.6**	**F**	**120.8**	**F**	**+4.6**	**0.012**
22	San Tomas Expressway and Walsh Avenue	Santa Clara	E	AM	11/07/17	45.5	D	45.6	D	79.0	E-	79.7	E-	-0.2	0.001	**122.0**	**F**	**123.7**	**F**	**+2.7**	**0.005**
				PM	03/07/18	70.1	E	71.1	E	**129.1**	**F**	**131.2**	**F**	+3.1	0.006	**157.4**	**F**	**159.7**	**F**	**+3.3**	**0.006**
23	San Tomas Expressway and Monroe Street*	Santa Clara	E	AM	11/07/17	37.0	D+	37.1	D+	56.5	E+	57.9	E+	+2.2	0.005	73.3	E	74.9	E	+2.6	0.005
				PM	10/04/16	45.4	D	45.8	D	78.1	E-	**80.1**	**F**	**+3.5**	**0.006**	**105.6**	**F**	**107.7**	**F**	**+3.7**	**0.006**
24	San Tomas Expressway and Cabrillo Avenue	Santa Clara	E	AM	11/07/17	29.4	C	29.4	C	34.0	C-	34.4	C-	-0.1	0.001	41.7	D	43.0	D	+1.9	0.005
				PM	03/07/18	35.0	C-	35.2	D+	40.9	D	41.4	D	0.0	0.001	51.1	D-	52.4	D-	+2.0	0.005
25	San Tomas Expressway and El Camino Real*	Santa Clara	E	AM	11/07/17	70.0	E	70.5	E	**98.5**	**F**	**99.8**	**F**	**+2.1**	**0.005**	**116.7**	**F**	**118.2**	**F**	**+2.4**	**0.005**
				PM	10/04/16	78.3	E-	79.5	E-	**121.9**	**F**	**123.8**	**F**	**+3.3**	**0.005**	**139.2**	**F**	**140.9**	**F**	**+3.1**	**0.005**

Table ES 1 (Continued)
Intersection Level of Service Summary

Study Number	Intersection	Jurisdiction	LOS Standard	Peak Hour	Count Date	Existing Avg. Delay	Existing LOS	Existing Plus Project Avg. Delay	Existing Plus Project LOS	Background Avg. Delay	Background LOS	Background Plus Project Avg. Delay	Background Plus Project LOS	Background Plus Project Incr. In Crit. Delay	Background Plus Project Incr. In Crit. V/C	Cumulative Avg. Delay	Cumulative LOS	Cumulative Plus Project Avg. Delay	Cumulative Plus Project LOS	Cumulative Plus Project Incr. In Crit. Delay	Cumulative Plus Project Incr. In Crit. V/C
26	Scott Boulevard and Central Expressway*	Santa Clara	E	AM	11/07/17	40.5	D	40.6	D	44.4	D	44.6	D	+0.1	0.003	45.8	D	45.9	D	+0.1	0.003
				PM	10/04/16	69.7	E	70.3	E	**85.4**	**F**	**86.4**	**F**	**+1.0**	**0.003**	**96.1**	**F**	**97.4**	**F**	**+1.1**	**0.003**
27	Lafayette Street and Central Expressway*	Santa Clara	E	AM	11/07/17	54.3	D-	54.5	D-	74.4	E	75.0	E	+1.7	0.004	**83.6**	**F**	**84.2**	**F**	**+1.9**	**0.004**
				PM	10/04/16	68.5	E	68.5	E	**111.5**	**F**	**111.5**	**F**	**+0.2**	**0.001**	**119.4**	**F**	**119.4**	**F**	**+0.2**	**0.002**
28	Lakeside Drive and Augustine Drive	Santa Clara	D	AM	03/07/18	27.8	C	**85.4**	**F**	27.8	C	**85.4**	**F**	**+69.9**	**0.264**	27.8	C	**85.4**	**F**	**+69.9**	**0.264**
				PM	03/07/18	36.5	D+	**81.3**	**F**	36.5	D+	**81.3**	**F**	**+67.4**	**0.182**	36.5	D+	**81.3**	**F**	**+67.4**	**0.182**
31	Lawrence Expressway and US 101 Northbound Ramps	Sunnyvale	E	AM	03/07/18	10.0	A	10.0	A	10.5	B+	10.5	B+	0.0	0.000	10.6	B+	10.6	B+	0.0	0.000
				PM	03/07/18	12.3	B	12.3	B	12.6	B	12.6	B	0.0	0.000	12.7	B	12.7	B	0.0	0.000
32	Lawrence Expressway and US 101 Southbound Ramps	Sunnyvale	E	AM	08/30/16	21.6	C+	25.5	C	13.8	B	15.5	B	+3.2	0.008	14.1	B	16.0	B	+3.4	0.008
				PM	08/30/16	45.7	D	46.2	D	27.6	C	27.7	C	+0.3	0.002	26.0	C	26.0	C	+0.1	0.002
33	Lawrence Expressway and Oakmead Parkway	Sunnyvale	E	AM	03/07/18	36.2	D+	37.3	D+	56.3	E+	58.0	E+	+3.0	0.013	62.1	E	64.1	E	+3.7	0.013
				PM	03/07/18	45.8	D	46.0	D	53.7	D-	54.1	D-	+0.1	0.001	56.3	E+	56.7	E+	+0.2	0.001
34	Lawrence Expressway and Arques Avenue*	Sunnyvale	E	AM	08/30/16	41.3	D	41.6	D	48.9	D	49.1	D	0.0	0.000	51.5	D-	51.6	D-	0.0	0.000
				PM	10/04/16	68.1	E	68.5	E	**108.1**	**F**	**108.3**	**F**	**+0.5**	**0.012**	**115.5**	**F**	**116.0**	**F**	**+1.0**	**0.012**
35	Lakeside Drive and Oakmead Parkway	Sunnyvale	D	AM	03/07/18	20.1	C+	19.1	B-	20.3	C+	19.9	B-	+1.2	0.026	20.3	C+	19.9	B-	+1.3	0.026
				PM	03/07/18	20.1	C+	19.7	B-	20.2	C+	19.8	B-	-0.1	0.006	20.3	C+	20.0	B-	-0.1	0.006
36	Lakeside Drive and Arques Avenue	Sunnyvale	D	AM	08/30/16	23.7	C	23.2	C	22.7	C+	22.2	C+	-0.1	0.003	22.4	C+	22.0	C+	-0.1	0.003
				PM	08/30/16	19.5	B-	19.2	B-	17.9	B	17.9	B	0.0	0.004	17.9	B	18.6	B-	+2.2	0.104
37	Oakmead Parkway and Arques Avenue/Scott Boulevard	Sunnyvale	D	AM	08/30/16	21.9	C+	22.1	C+	21.7	C+	21.8	C+	-0.1	0.003	21.7	C+	21.8	C+	-0.1	0.003
				PM	08/30/16	25.8	C	26.3	C	26.3	C	26.5	C	+0.9	0.027	26.2	C	26.5	C	+0.9	0.027
38	Oakmead Parkway/Corvin Drive and Central Expressway*	Sunnyvale	E	AM	11/07/17	43.1	D	47.1	D	78.6	E-	**84.6**	**F**	**+10.7**	**0.020**	**109.3**	**F**	**115.6**	**F**	**+11.1**	**0.020**
				PM	10/04/16	48.5	D	48.8	D	79.9	E-	**80.3**	**F**	**0.0**	**0.000**	**113.0**	**F**	**113.1**	**F**	**0.0**	**0.000**
39	Great America Parkway and SR 237 Westbound Ramps*	San Jose	D	AM	10/12/16	17.8	B	17.9	B	48.3	D	50.3	D	+2.6	0.008	**59.1**	**E+**	**61.5**	**E**	**+3.0**	**0.008**
				PM	11/02/16	17.8	B	17.9	B	27.9	C	28.6	C	+0.8	0.009	32.6	C-	33.8	C-	+1.4	0.009
40	Great America Parkway and SR 237 Eastbound Ramps*	San Jose	D	AM	10/12/16	12.6	B	12.5	B	12.7	B	12.7	B	0.0	0.006	12.6	B	12.6	B	0.0	0.006
				PM	11/02/16	10.3	B+	10.2	B+	12.6	B	12.8	B	+0.2	0.010	13.3	B	13.5	B	+0.4	0.010

Notes:
* Denotes CMP Intersections
Entries denoted in **bold** indicate conditions that exceed the applicable level of service standard.
Bold and boxed indicate significant project impact.

Table ES 2
Freeway Segment Level of Service Summary

#	Freeway	Segment	Direction	Peak Hour	Existing Plus Project														Project Trips				
					Mixed-Flow Lane							HOV Lane								Mixed-Flow Lane		HOV Lane	
					Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	Total Volume	Volume[2]	% of Capacity	Volume[2]	% of Capacity
1	US 101	from I-880 to Old Bayshore Highway	NB	AM	8	3	6,900	3,050	3,125	**130**	**F**	15	1	1,650	1,470	1,499	**100**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	67	3	6,900	3,200	3,219	16	B	70	1	1,650	840	844	12	B	23	19	0.28	4	0.24
2	US 101	from Old Bayshore Highway to North First Street	NB	AM	9	3	6,900	3,300	3,375	**125**	**F**	12	1	1,650	1,300	1,329	**111**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	67	3	6,900	3,400	3,419	17	B	70	1	1,650	560	564	8	A	23	19	0.28	4	0.24
3	US 101	from North First Street to Guadalupe Parkway (SR 87)	NB	AM	12	3	6,900	3,890	3,965	**110**	**F**	11	1	1,650	1,210	1,239	**113**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	67	3	6,900	2,800	2,819	14	B	70	1	1,650	630	634	9	A	23	19	0.28	4	0.24
4	US 101	from Guadalupe Parkway (SR 87) to De La Cruz Boulevard	NB	AM	8	3	6,900	3,050	3,125	**130**	**F**	12	1	1,650	1,290	1,319	**110**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	66	3	6,900	3,770	3,789	19	C	70	1	1,650	630	634	9	A	23	19	0.28	4	0.24
5	US 101	from De La Cruz Boulevard to San Tomas Expressway/Montague Expressway	NB	AM	23	3	6,900	5,250	5,325	**77**	**F**	26	1	1,650	1,850	1,879	**72**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	66	3	6,900	4,760	4,779	24	C	70	1	1,650	770	774	11	A	23	19	0.28	4	0.24
6	US 101	from San Tomas Expressway/Montague Expressway to Bowers Avenue/Great America Parkway	NB	AM	15	3	6,900	4,370	4,445	**99**	**F**	19	1	1,650	1,640	1,669	**88**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	66	3	6,900	5,510	5,529	28	D	70	1	1,650	770	774	11	A	23	19	0.28	4	0.24
7	US 101	from Bowers Avenue/Great America Parkway to Lawrence Expressway	NB	AM	16	3	6,900	4,470	4,474	**93**	**F**	21	1	1,650	1,710	1,711	**81**	**F**	5	4	0.06	1	0.06
			NB	PM	65	3	6,900	5,660	5,688	29	D	70	1	1,650	1,120	1,126	16	B	34	28	0.41	6	0.36
8	US 101	from Lawrence Expressway to North Fair Oaks Avenue	NB	AM	19	3	6,900	4,790	4,798	**84**	**F**	25	1	1,650	1,830	1,833	**73**	**F**	11	8	0.12	3	0.18
			NB	PM	65	3	6,900	5,660	5,718	29	D	70	1	1,650	840	849	12	B	67	58	0.84	9	0.55
9	US 101	from North Fair Oaks Avenue to North Mathilda Avenue	NB	AM	33	3	6,900	5,940	5,948	**60**	**F**	38	1	1,650	2,060	2,063	54	E	11	8	0.12	3	0.18
			NB	PM	66	3	6,900	4,760	4,818	24	C	70	1	1,650	770	779	11	A	67	58	0.84	9	0.55
10	US 101	from North Mathilda Avenue to SR 237	NB	AM	43	3	6,900	6,330	6,338	49	E	26	1	1,650	1,850	1,853	**71**	**F**	11	8	0.12	3	0.18
			NB	PM	66	3	6,900	4,760	4,812	24	C	70	1	1,650	1,400	1,415	20	C	67	52	0.75	15	0.91
11	SR 237	from Lawrence Expressway to Great America Parkway	EB	AM	64	2	4,400	4,100	4,116	32	D	67	1	1,650	1,210	1,215	18	B	21	16	0.36	5	0.30
			EB	PM	14	2	4,400	2,830	2,833	**101**	**F**	30	1	1,650	2,070	2,072	**69**	**F**	5	3	0.07	2	0.12
12	SR 237	from Great America Parkway to North First Street	EB	AM	64	2	4,400	4,100	4,104	32	D	66	1	1,650	1,390	1,391	21	C	5	4	0.09	1	0.06
			EB	PM	12	2	4,400	2,550	2,569	**107**	**F**	30	1	1,650	1,920	1,932	**64**	**F**	31	19	0.43	12	0.73
13	SR 237	from North First Street to Zanker Road	EB	AM	48	2	4,400	4,320	4,324	45	D	67	1	1,650	1,010	1,011	15	B	5	4	0.09	1	0.06
			EB	PM	25	2	4,400	3,600	3,619	**72**	**F**	50	1	1,650	2,350	2,362	47	E	31	19	0.43	12	0.73
14	SR 237	from Zanker Road to McCarthy Boulevard	EB	AM	66	2	4,400	3,670	3,674	28	D	67	1	1,650	1,010	1,011	15	B	5	4	0.09	1	0.06
			EB	PM	52	2	4,400	4,370	4,389	42	D	70	1	1,650	1,960	1,972	28	D	31	19	0.43	12	0.73
15	SR 237	from McCarthy Boulevard to I-880	EB	AM	66	2	4,400	2,860	2,864	22	C	67	1	1,650	470	471	7	A	5	4	0.09	1	0.06
			EB	PM	66	2	4,400	2,720	2,739	21	C	60	1	1,650	2,280	2,292	38	D	31	19	0.43	12	0.73
16	US 101	from SR 237 to North Mathilda Avenue	SB	AM	66	3	6,900	4,560	4,575	23	C	55	1	1,650	2,200	2,248	41	D	63	15	0.22	48	2.91
			SB	PM	18	3	6,900	4,700	4,705	**87**	**F**	40	1	1,650	2,400	2,409	**60**	**F**	14	5	0.07	9	0.55
17	US 101	from North Mathilda Avenue to North Fair Oaks Avenue	SB	AM	66	3	6,900	4,760	4,775	24	C	67	1	1,650	1,210	1,258	19	C	63	15	0.22	48	2.91
			SB	PM	25	3	6,900	5,400	5,405	**72**	**F**	30	1	1,650	2,040	2,049	**68**	**F**	14	5	0.07	9	0.55
18	US 101	from North Fair Oaks Avenue to Lawrence Expressway	SB	AM	66	3	6,900	5,510	5,525	28	D	67	1	1,650	1,140	1,188	18	B	63	15	0.22	48	2.91
			SB	PM	16	3	6,900	4,420	4,425	**92**	**F**	20	1	1,650	2,120	2,129	**106**	**F**	14	5	0.07	9	0.55
19	US 101	from Lawrence Expressway to Bowers Avenue/Great America Parkway	SB	AM	62	3	6,900	6,510	6,537	35	D	67	1	1,650	1,010	1,014	15	B	31	27	0.39	4	0.24
			SB	PM	11	3	6,900	3,670	3,674	**111**	**F**	20	1	1,650	2,040	2,043	**102**	**F**	7	4	0.06	3	0.18
20	US 101	from Bowers Avenue/Great America Parkway to San Tomas Expressway/Montague Expressway	SB	AM	66	3	6,900	4,160	4,176	21	C	67	1	1,650	940	942	14	B	18	16	0.23	2	0.12
			SB	PM	12	3	6,900	3,890	3,962	**110**	**F**	20	1	1,650	2,180	2,220	**111**	**F**	112	**72**	**1.04**	**40**	**2.42**
21	US 101	from San Tomas Expressway/Montague Expressway to De La Cruz Boulevard	SB	AM	66	3	6,900	4,950	4,966	25	C	67	1	1,650	740	742	11	A	18	16	0.23	2	0.12
			SB	PM	11	3	6,900	3,670	3,742	**113**	**F**	30	1	1,650	2,130	2,170	**72**	**F**	112	**72**	**1.04**	40	2.42
22	US 101	from De La Cruz Boulevard to Guadalupe Parkway (SR 87)	SB	AM	66	3	6,900	4,950	4,966	25	C	67	1	1,650	410	412	6	A	18	16	0.23	2	0.12
			SB	PM	40	3	6,900	6,240	6,312	53	E	70	1	1,650	2,520	2,560	37	D	112	72	1.04	40	2.42
23	US 101	from Guadalupe Parkway (SR 87) to North First Street	SB	AM	67	3	6,900	3,200	3,216	16	B	67	1	1,650	210	212	3	A	18	16	0.23	2	0.12
			SB	PM	24	3	6,900	5,400	5,472	**76**	**F**	30	1	1,650	2,190	2,230	**74**	**F**	112	**72**	**1.04**	40	2.42
24	US 101	from North First Street to Old Bayshore Highway	SB	AM	67	3	6,900	2,600	2,616	13	B	67	1	1,650	140	142	2	A	18	16	0.23	2	0.12
			SB	PM	6	3	6,900	2,880	2,952	**164**	**F**	20	1	1,650	2,160	2,200	**110**	**F**	112	**72**	**1.04**	40	2.42
25	US 101	from Old Bayshore Highway to I-880	SB	AM	67	3	6,900	3,600	3,616	18	B	67	1	1,650	410	412	6	A	18	16	0.23	2	0.12
			SB	PM	6	3	6,900	2,450	2,522	**140**	**F**	20	1	1,650	1,800	1,840	**92**	**F**	112	**72**	**1.04**	40	2.42

Table ES 2 (Continued)
Freeway Segment Level of Service Summary

#	Freeway	Segment	Direction	Peak Hour	Existing Plus Project														Project Trips				
					Mixed-Flow Lane							HOV Lane								Mixed-Flow Lane			HOV Lane	
					Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	Total Volume	Volume[2]	% of Capacity	Volume[2]	% of Capacity
26	SR 237	from I-880 to McCarthy Boulevard	WB	AM	11	2	4,400	2,490	2,508	**114**	**F**	29	1	1,650	1,890	1,901	**66**	**F**	29	18	0.41	11	0.67
			WB	PM	66	2	4,400	2,640	2,645	20	C	70	1	1,650	630	631	9	A	6	5	0.11	1	0.06
27	SR 237	from McCarthy Boulevard to Zanker Road	WB	AM	10	2	4,400	2,760	2,778	**139**	**F**	24	1	1,650	1,780	1,791	**75**	**F**	29	18	0.41	11	0.67
			WB	PM	64	2	4,400	4,920	4,925	38	D	70	1	1,650	1,190	1,191	17	B	6	5	0.11	1	0.06
28	SR 237	from Zanker Road to North First Street	WB	AM	15	2	4,400	2,940	2,958	**99**	**F**	26	1	1,650	1,820	1,831	**70**	**F**	29	18	0.41	11	0.67
			WB	PM	48	2	4,400	4,320	4,325	45	D	70	1	1,650	770	771	11	A	6	5	0.11	1	0.06
29	SR 237	from North First Street to Great America Parkway	WB	AM	16	2	4,400	2,950	2,968	**93**	**F**	19	1	1,650	1,600	1,611	**85**	**F**	29	18	0.41	11	0.67
			WB	PM	58	2	4,400	4,410	4,415	38	D	70	1	1,650	980	981	14	B	6	5	0.11	1	0.06
30	SR 237	from Great America Parkway to Lawrence Expressway	WB	AM	13	2	4,400	2,680	2,682	**103**	**F**	20	1	1,650	1,640	1,642	**82**	**F**	4	2	0.05	2	0.12
			WB	PM	66	2	4,400	3,540	3,557	27	D	70	1	1,650	1,050	1,055	15	B	22	17	0.39	5	0.30

[1] Source: Santa Clara Valley Transportation Authority Congestion Management Program Monitoring Study, 2016.
[2] The breakdown of project trips between the mixed-flow and HOV lanes was estimated based on the average percentage of traffic currently utilizing the HOV lanes within the study freeway segments.
Bold indicates unacceptable LOS.
Boxed indicates significant impact.

1. Introduction

This report presents the results of the traffic impact analysis conducted for the proposed 3625 Peterson Way office development in the City of Santa Clara, California. The project site is generally located on the southwest quadrant of the US 101/Bowers Avenue interchange and is bounded by US 101 and Lakeside Drive to the north, Lakeside Drive to the east, Tanner Way to the south, and Peterson Way to the west. The proposed project consists of the construction of two 336,000-square foot (s.f.) office buildings and a four-level above grade parking structure with 15,000 s.f. of amenity space. The proposed office buildings would replace an existing on-site light-industrial buildings totaling approximately 218,375 s.f. Access for the proposed project would be provided via driveway on Peterson Way, Tannery Way, and Lakeside Drive.

The project site and the surrounding study area are shown on Figure 1. The proposed site plan is shown on Figure 2.

Scope of Study

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed development. Although the proposed project is located in the City of Santa Clara, the proposed project also would add traffic to facilities outside of the City of Santa Clara. Thus, the impacts of the project were evaluated following the standards and methodologies set forth by the Cities of Santa Clara, Sunnyvale, and San Jose, and the Santa Clara Valley Transportation Authority (VTA). The VTA administers the County Congestion Management Program (CMP). Since the project is expected to add more than 100 net peak hour vehicle trips, a CMP analysis is necessary, which includes a freeway level of service analysis.

The traffic study includes an analysis of AM and PM peak-hour traffic conditions for 40 intersections and 15 freeway segments (30 directional segments) in the vicinity of the project site. The study intersections were selected based upon the estimated number of project trips through the intersection (10 or more trips per lane per hour) and in coordination with the Cities of Santa Clara and Sunnyvale. The study also includes an analysis of freeway ramps serving the project site as well as transit, bicycle, and pedestrian access. The study intersections and freeway segments are listed below and shown on Figure 1.

Study Intersections

In summary, the study includes an analysis of 38 signalized and two unsignalized intersections in the vicinity of the project site. Thirty of the study intersections (including both of the unsignalized

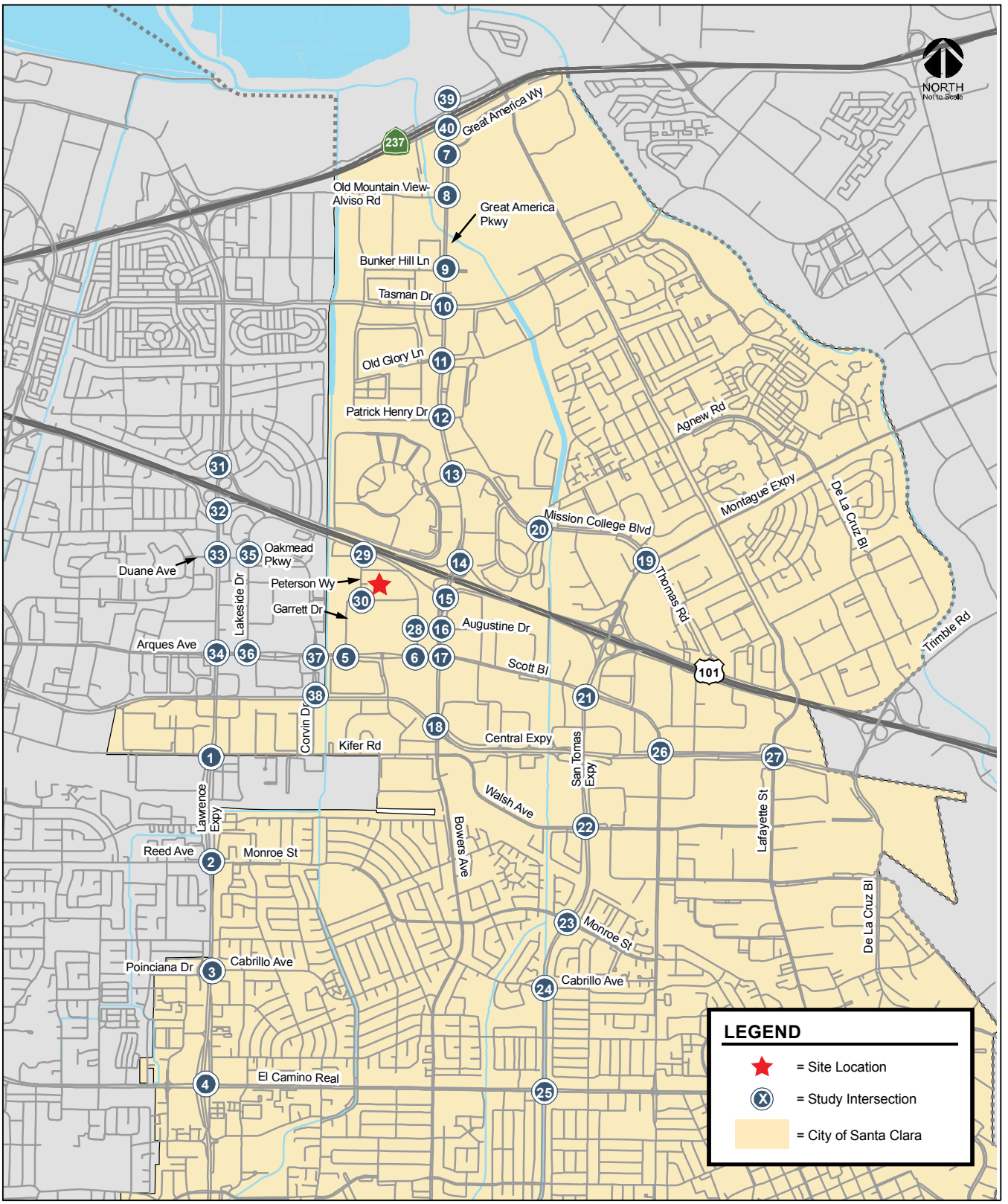


Figure 1
Site Location and Study Intersections

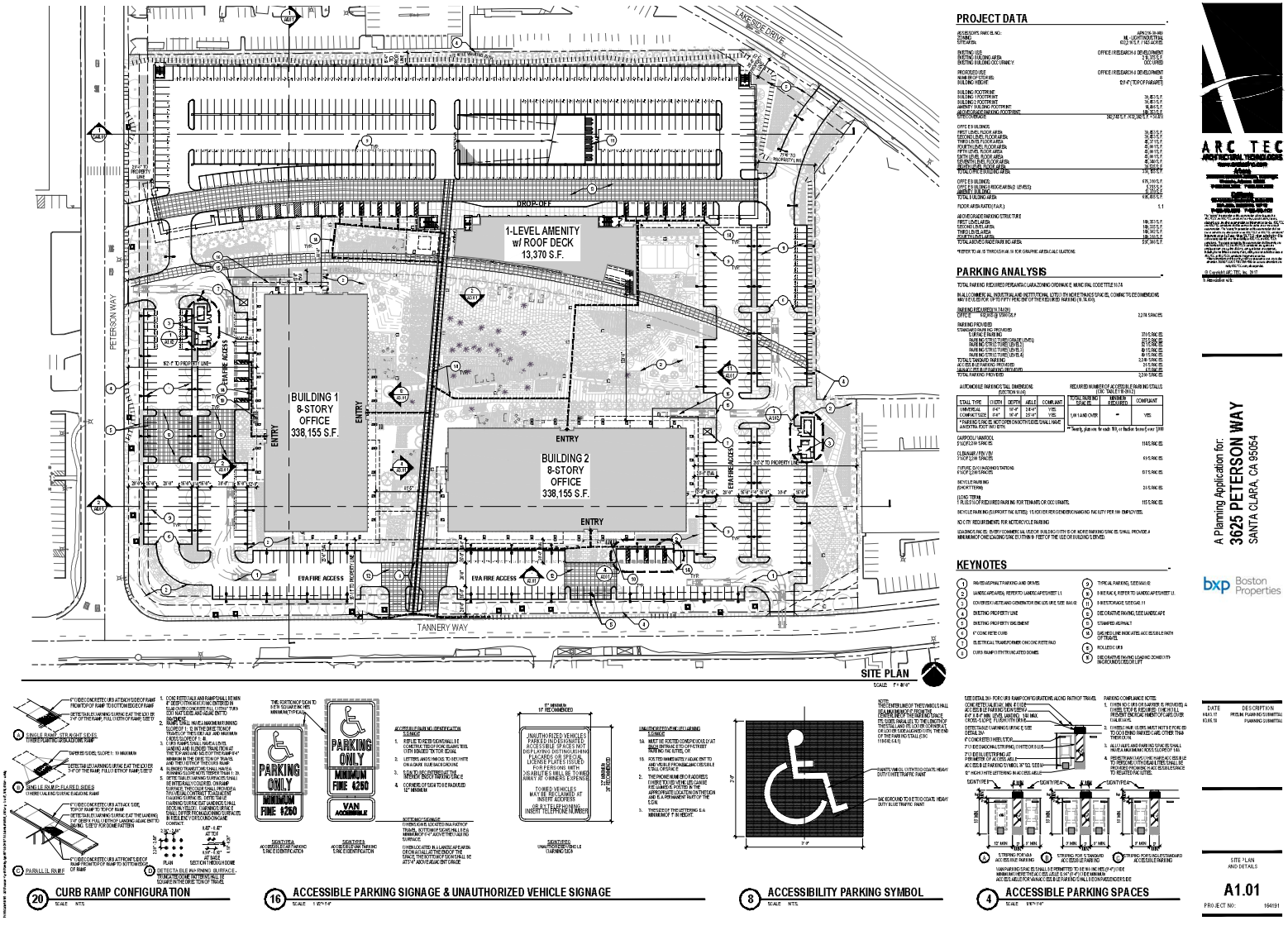


Figure 2
Project Site Plan

intersections) are located in the City of Santa Clara, 8 signalized study intersections are located in the City of Sunnyvale, and 2 signalized study intersections are located in the City of San Jose. A total of 18 of the study intersections also are CMP designated intersections. All of the study intersections were evaluated against the standards of the applicable municipality, while the 18 CMP signalized study intersections also were evaluated against the standards of the Santa Clara County CMP. The operations of the unsignalized study intersections also were evaluated; however, they are not subject to the City of Santa Clara level of service policy.

City of Santa Clara Intersections

1. Lawrence Expressway and Kifer Road
2. Lawrence Expressway and Monroe Street*
3. Lawrence Expressway and Cabrillo Avenue
4. Lawrence Expressway and El Camino Real*
5. Garrett Drive and Scott Boulevard
6. Lakeside Drive and Scott Boulevard
7. Great America Parkway and Great America Way
8. Great America Parkway and Old Mountain View-Alviso Road
9. Great America Parkway and Bunker Hill Lane
10. Great America Parkway and Tasman Drive*
11. Great America Parkway and Old Glory Lane
12. Great America Parkway and Patrick Henry Drive
13. Great America Parkway and Mission College Boulevard*
14. Great America Parkway and US 101 Northbound Ramps*
15. Bowers Avenue and US 101 Southbound Ramps*
16. Bowers Avenue and Augustine Drive
17. Bowers Avenue and Scott Boulevard*
18. Bowers Avenue and Central Expressway*
19. Mission College Boulevard and Montague Expressway*
20. Agnew Road/Freedom Circle and Mission College Boulevard
21. San Tomas Expressway and Scott Boulevard*
22. San Tomas Expressway and Walsh Avenue
23. San Tomas Expressway and Monroe Street*
24. San Tomas Expressway and Cabrillo Avenue
25. San Tomas Expressway and El Camino Real*
26. Scott Boulevard and Central Expressway*
27. Lafayette Street and Central Expressway*
28. Lakeside Drive and Augustine Drive
29. Peterson Way and Lakeside Drive (unsignalized)
30. Peterson Way and Tannery Way (unsignalized)

* Denotes CMP intersection

City of Sunnyvale Intersections

31. Lawrence Expressway and US 101 Northbound Ramps
32. Lawrence Expressway and US 101 Southbound Ramps
33. Lawrence Expressway and Oakmead Parkway
34. Lawrence Expressway and Arques Avenue*
35. Lakeside Drive and Oakmead Parkway
36. Lakeside Drive and Arques Avenue
37. Oakmead Parkway and Arques Avenue/Scott Boulevard

38. Oakmead Parkway/Corvin Drive and Central Expressway*

City of San Jose Intersections

39. Great America Parkway and SR 237 Westbound Ramps*
40. Great America Parkway and SR 237 Eastbound Ramps*

Study Freeway Segments

1. Northbound US 101, from I-880 to Old Bayshore Highway
2. Northbound US 101, from Old Bayshore Highway to North First Street
3. Northbound US 101, from North First Street to Guadalupe Parkway (SR 87)
4. Northbound US 101, from Guadalupe Parkway (SR 87) to De La Cruz Boulevard
5. Northbound US 101, from De La Cruz Boulevard to San Tomas Expressway/Montague Expressway
6. Northbound US 101, from San Tomas Expressway/Montague Expressway to Bowers Avenue/Great America Parkway
7. Northbound US 101, from Bowers Avenue/Great America Parkway to Lawrence Expressway
8. Northbound US 101, from Lawrence Expressway to North Fair Oaks Avenue
9. Northbound US 101, from North Fair Oaks Avenue to North Mathilda Avenue
10. Northbound US 101, from North Mathilda Avenue to SR 237
11. Eastbound SR 237, from Lawrence Expressway to Great America Parkway
12. Eastbound SR 237, from Great America Parkway to North First Street
13. Eastbound SR 237, from North First Street to Zanker Road
14. Eastbound SR 237, from Zanker Road to McCarthy Boulevard
15. Eastbound SR 237, from McCarthy Boulevard to I-880
16. Southbound US 101, from SR 237 to North Mathilda Avenue
17. Southbound US 101, from North Mathilda Avenue to North Fair Oaks Avenue
18. Southbound US 101, from North Fair Oaks Avenue to Lawrence Expressway
19. Southbound US 101, from Lawrence Expressway to Bowers Avenue/Great America Parkway
20. Southbound US 101, from Bowers Avenue/Great America Parkway to San Tomas Expressway/Montague Expressway
21. Southbound US 101, from San Tomas Expressway/Montague Expressway to De La Cruz Boulevard
22. Southbound US 101, from De La Cruz Boulevard to Guadalupe Parkway (SR 87)
23. Southbound US 101, from Guadalupe Parkway (SR 87) to North First Street
24. Southbound US 101, from North First Street to Old Bayshore Highway
25. Southbound US 101, from Old Bayshore Highway to I-880
26. Westbound SR 237, from I-880 to McCarthy Boulevard
27. Westbound SR 237, from McCarthy Boulevard to Zanker Road
28. Westbound SR 237, from Zanker Road to North First Street
29. Westbound SR 237, from North First Street to Great America Parkway
30. Westbound SR 237, from Great America Parkway to Lawrence Expressway

Study Time Periods

Traffic conditions at the study intersections were analyzed for both the weekday AM and PM peak hours of adjacent street traffic. The AM peak hour of traffic is generally between 7:00 AM and 9:00 AM and the PM peak hour typically occurs between 4:00 PM and 6:00 PM on an average weekday. These are the peak commute hours during which most traffic congestion occurs on the roadways.

Study Scenarios

Traffic conditions were evaluated for the following scenarios:

Scenario 1: *Existing Conditions.* Existing conditions were represented by existing peak-hour traffic volumes on the existing roadway network. Existing traffic volumes were obtained from 2016 CMP count data, recently completed traffic studies, and new traffic counts conducted in March 2018.

Scenario 2: *Existing plus Project Conditions*. Existing plus project conditions represent existing peak-hour traffic volumes with the addition of traffic generated by the proposed project if the project was open and operating today. Existing plus project conditions were evaluated relative to existing conditions in order to identify potential deficiencies associated solely with the proposed project.

Scenario 3: *Background Conditions*. Background conditions were represented by future traffic volumes on the future roadway network. Background traffic volumes were estimated by adding to existing peak-hour volumes the projected volumes from approved but not yet constructed developments in the study area. The added traffic from approved but not yet constructed developments was based on the list of approved projects provided by the Cities of Santa Clara and Sunnyvale. San Jose's Approved Trip Inventory (ATI) volumes and traffic generated by Phase 1 of the North San Jose Development Policy also were included in the background traffic volumes. Background conditions include fully funded transportation improvements planned in the City's Capital Improvement Program or required as mitigation for other approved developments. Background conditions represent the baseline conditions to which project conditions are compared for the purpose of determining project impacts.

Scenario 4: *Background plus Project Conditions*. Background plus project conditions (also referred to as *Project Conditions*) were estimated by adding to the background traffic volumes the additional traffic estimated to be generated by the proposed project. Background plus project conditions were evaluated relative to background conditions in order to determine potential project impacts.

Scenario 5: *Cumulative Conditions*. Cumulative conditions represent future traffic volumes on the future transportation network. Cumulative conditions include traffic growth projected to occur due to the approved development projects, the proposed project, and other proposed but not yet approved (pending) development projects in the study area. The added traffic from pending projects was based on the list of pending projects within the City of Santa Clara, and pending developments identified by the Cities of San Jose and Sunnyvale.

Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from new traffic counts, previous traffic studies, the Cities of Santa Clara, San Jose, and Sunnyvale, the CMP, and field observations. The following data were collected from these sources:

- Existing traffic volumes
- Existing lane configurations
- Signal timing and phasing
- Average speed on freeway segments
- Existing freeway ramp meter service rates and queue lengths
- A list of approved and planned projects

Analysis Methodologies and Level of Service Standards

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The various analysis methods are described below.

Signalized Intersections

Signalized study intersections that are not part of the CMP roadway network are subject to the local municipalities' level of service standards. The Cities of Santa Clara, Sunnyvale, and San Jose level of service methodology is TRAFFIX, which is based on the *Highway Capacity Manual (HCM) 2000* method for signalized intersections. TRAFFIX evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. Intersection traffic signal parameters information for non-CMP study intersection located in the City of Santa Clara was obtained from City staff in the form of signal timing sheets. Additionally, signal timing information for CMP intersections is provided by Santa Clara County staff. The Cities of Sunnyvale and San Jose level of service methodologies employ CMP default values for their analysis parameters.

The Cities of Santa Clara and Sunnyvale have set forth LOS D as the minimum standard, except on CMP and expressway facilities within Santa Clara and roadways considered "regionally significant" within Sunnyvale, which have a standard of LOS E. In the study area, the Sunnyvale intersections along Lawrence Expressway are considered regionally significant. The City of San Jose's level of service standard is LOS D or better for all signalized intersections, including CMP intersections. The correlation between average delay and level of service is shown in Table 1.

CMP Intersections

Since TRAFFIX is the designated level of service methodology for both the CMP and local municipalities, the CMP study intersections are not analyzed separately, but rather are among the local municipalities' signalized intersections analyzed using TRAFFIX. However, unlike the City of Santa Clara, the CMP employs default values for intersection analysis parameters derived based on local traffic conditions. Additionally, the CMP analysis determines project impacts on the basis of different level of service standards – the CMP level of service standard for signalized intersections is LOS E or better.

Unsignalized Intersections

The study includes the analysis of two unsignalized intersections located in the City of Santa Clara. The City of Santa Clara does not have a level of service standard for unsignalized intersections. The two unsignalized study intersections were analyzed for operational purposes.

Table 1
Signalized Intersection Level of Service Definitions Based on Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (Sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	Up to 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	Greater than 80.0

Source: Transportation Research Board, 2000 Highway Capacity Manual. (Washington, D.C., 2000)

Freeway Segment Analysis

As prescribed in the CMP technical guidelines, the level of service for freeway segments is estimated based on vehicle density. Density is calculated by the following formula:

$$D = V / (N*S)$$

where:

D= density, in vehicles per mile per lane (vpmpl)
V= peak hour volume, in vehicles per hour (vph)
N= number of travel lanes
S= average travel speed, in miles per hour (mph)

The vehicle density on a segment is correlated to level of service as shown in Table 2. The CMP requires that mixed-flow lanes and auxiliary lanes be analyzed separately from high-occupancy vehicle (HOV) lanes (otherwise known as carpool lanes). The CMP specifies that a capacity of 2,300 vehicles per hour per lane (vphpl) be used for segments three lanes or wider in one direction and a capacity of 2,200 vphpl be used for segments two lanes wide in one direction. HOV lanes are specified as having a capacity of 1,650 vphpl. The CMP defines an acceptable level of service for freeway segments as LOS E or better.

Table 2
Freeway Segment Level of Service Definitions Based on Density

Level of Service	Description	Density (vehicles/mile/lane)
A	Average operating speeds at the free-flow speed generally prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	0-11
B	Speeds at the free-flow speed are generally maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high.	>11-18
C	Speeds at or near the free-flow speed of the freeway prevail. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more vigilance on the part of the driver.	>18-26
D	Speeds begin to decline slightly with increased flows at this level. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels.	>26-46
E	At this level, the freeway operates at or near capacity. Operations in this level are volatile, because there are virtually no usable gaps in the traffic stream, leaving little room to maneuver within the traffic stream.	>46-58
F	Vehicular flow breakdowns occurs. Large queues form behind breakdown points.	>58

Source: Santa Clara County 2004 CMP (Based on the *Highway Capacity Manual (2000)*, Washington, D.C.).

Report Organization

The remainder of this report is divided into seven additional chapters. Chapter 2 describes the existing conditions in terms of the existing roadway network, transit service, and existing bicycle and pedestrian facilities. Chapter 3 describes the method used to estimate project traffic and the resulting traffic conditions expected under existing plus project conditions. Chapter 4 presents the intersection levels of service under background conditions with the addition of traffic from approved development projects. Chapter 5 presents traffic conditions, potential project impacts, and recommended mitigation measures under background plus project conditions. Chapter 6 presents the traffic conditions in the study area under cumulative conditions with the addition of traffic from development projects that are not yet approved, and cumulative plus project conditions with the addition of project trips to the cumulative volumes. Chapter 7 presents the analysis of other transportation related issues, including impacts to transit, bicycle facilities, and freeway ramps. Chapter 8 presents the conclusions of the traffic impact analysis.

2. Existing Conditions

This chapter describes the existing conditions for transportation facilities in the vicinity of the site, including the roadway network, transit service, pedestrian and bicycle facilities.

Existing Roadway Network

Regional access to the project site is provided via US 101 and State Route (SR) 237, as described below.

US 101 is an eight-lane (three mixed-flow lanes and one high-occupancy vehicle (HOV) lane in each direction) freeway in the vicinity of the site. It extends north through San Francisco and south through Gilroy. Regional access to the project site is provided via its interchanges with Lawrence Expressway and Great America Parkway/Bowers Avenue.

SR 237 is a six-lane freeway and extends in an east/west direction between Sunnyvale and Milpitas, providing access to I-880 and US 101. Two of the six lanes (one in each direction) are designated as HOV lanes between Zanker Road and US 101. There are toll lanes (one in each direction) provided between Zanker Road and I-880. Access to the project site is provided via its interchanges with Great America Parkway and Lawrence Expressway.

Local access to the site is provided by Scott Boulevard, Arques Avenue, Central Expressway, Lawrence Expressway, Bowers Avenue, Great America Parkway, San Tomas Expressway, Garrett Drive, Tannery Way, Lakeside Drive, and Peterson Way.

Scott Boulevard is a divided four-lane east-west arterial in the vicinity of the project. It extends from the Sunnyvale/Santa Clara border near Oakmead Parkway eastward and southward to Saratoga Avenue. West of Oakmead Parkway it becomes Arques Avenue, and south of Saratoga Avenue, it becomes Newhall Street.

Arques Avenue is a four-lane east-west roadway that extends from the Sunnyvale/Santa Clara border near Oakmead Parkway as it transitions from Scott Boulevard westward to San Bernardino Way where it terminates. West of North Fair Oaks Avenue, Arques Avenue provides access to westbound and from eastbound Central Expressway via two ramps.

Central Expressway is a six-lane east-west expressway with carpool (HOV) lanes east of San Tomas Expressway. The HOV lane designation is in effect in both directions of travel during both the AM and PM peak commute hours. West of San Tomas Expressway, Central Expressway has four mixed-flow lanes and no HOV lanes. Central Expressway begins at its junction with De la Cruz Boulevard and extends westward into Palo Alto, where it transitions into Alma Street at San Antonio Road.

Lawrence Expressway is a north-south expressway that begins at Saratoga Avenue in West San Jose and extends northward to SR 237, in Sunnyvale, where it transitions to Caribbean Drive. Full interchanges are located at SR 237, US 101, and I-280. Lawrence Expressway provides access to and from the project site via Arques Avenue/Scott Boulevard.

Great America Parkway is a six- to eight-lane north-south arterial that begins at US 101 and extends northward to SR 237 where it terminates at an office park as America Center Drive. Great America Parkway provides regional access to the project site via its full interchanges with US 101 and SR 237.

Bowers Avenue is the southern extension of Great America Parkway. It begins at US 101 as a six-lane arterial and extends southward to Kifer Road/Walsh Avenue, where it transitions into a four-lane roadway with a divided median. At Chromite Drive to the south, Bowers Avenue becomes a four-lane road with no median divider. Bowers Avenue continues south to its intersection with El Camino Real (SR 82), where it transitions to Kiely Boulevard. A full interchange is located at US 101. Bowers Avenue provides access to and from the project site via Scott Boulevard and Augustine Drive.

San Tomas Expressway is a north-south expressway that begins at US 101 and extends southward through Santa Clara and San Jose and into Campbell, where it transitions into Camden Avenue at SR 17. Full interchanges are located at US 101 and SR 17. In the north, San Tomas Expressway is an eight-lane roadway including HOV lanes. Currently, the HOV lane designation is in effect in both directions of travel during both the AM and PM peak commute hours. During other times, the HOV lane is open to all users. South of El Camino Real and north of Homestead Road, San Tomas narrows to a 6-lane facility including HOV lanes. This segment of San Tomas Expressway is currently under construction to be widened from three to four lanes in each direction, and it was observed that all HOV signage was removed due to the construction activity. Nevertheless, it was assumed in this analysis that the HOV lane designation in this segment of San Tomas Expressway is in effect during the peak hours, as described above. San Tomas Expressway provides access to and from the project site via Scott Boulevard.

Garrett Drive is a two-lane north-south undivided roadway that extends from its T-intersections with Scott Boulevard northward to Tannery Way.

Tannery Way is a two-lane east-west undivided roadway that extends from Garrett Drive to Lakeside Drive. Tannery Way is the southern project site boundary and would provide direct access to the project site via two full-access driveways.

Lakeside Drive is a three-lane roadway with one lane in each direction and a center turn lane that forms a half-loop from Arques Avenue to Scott Boulevard. Lakeside Drive is the northern project site boundary and would provide access to the project site via one driveway located at the northeast corner of the project site.

Peterson Way is a two-lane north-south undivided roadway that extends from Tannery Way to Lakeside Drive. Peterson Way is the western project site boundary and would provide direct access to the project site via two full-access driveways.

Existing Bicycle and Pedestrian Facilities

There are numerous bike lanes and bike paths in the vicinity of the project site. The existing bicycle facilities within the study area are described below and shown on Figure 3.

Class I Trail or Path is an off-street path with exclusive right-of-way for non-motorized transportation used for commuting as well as recreation. There is a Class I bike path adjacent to San Tomas Aquino Creek/San Tomas Expressway that extends from El Camino Real to Great America Parkway and

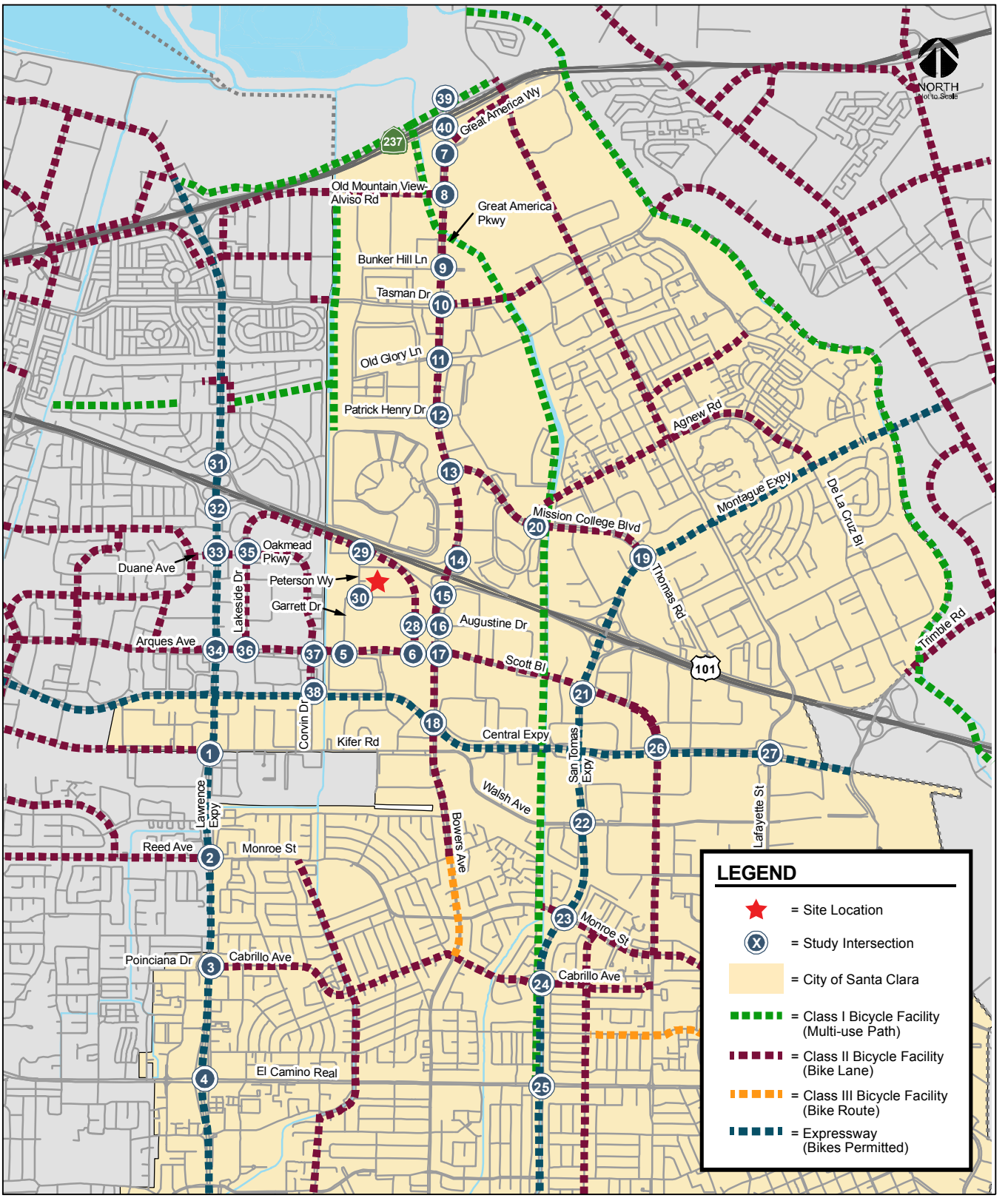


Figure 3
Existing Bicycle Facilities

Sunnyvale Baylands Park. The bike path can be accessed via the bike lanes on Scott Boulevard. The John W. Christian Greenbelt also includes a Class I bike path north of the project site. The greenbelt extends from the Calabazas Creek Trail to Duncan Avenue in Sunnyvale and can be accessed via the bike facilities along Lawrence Expressway. The Calabazas Creek Trail also is located north of the project site and consists of a 1.5-mile pedestrian and bicycle trail between U.S. 101 and SR 237. This paved trail connects Mission College, the John W. Christian Greenbelt at Fairwood Park, VTA's Reamwood Light Rail Station, and the San Tomas Aquino and Bay Trails via Old Mountain View-Alviso Road.

Class II Bike Lanes are preferential use areas within a roadway designated for bicycles. Within the project vicinity, Class II bikeways are present along the following roadways:

- Scott Boulevard/Arques Avenue, from Monroe Street to North Fair Oaks Avenue in Sunnyvale,
- Bowers Avenue/Great America Parkway, from Chromite Drive to SR 237
- Oakmead Parkway from Central Expressway to Duane Avenue in Sunnyvale, and
- Lakeside Drive, along the entire length of the road.

Class III Bike Routes are signed bike routes that provide a connection through residential, downtown, and rural/hillside areas to Class I and Class II facilities. Bike routes serve as transportation routes within neighborhoods to parks, schools, and other community amenities. Although none of the local commercial streets near the project site (e.g. Garrett Drive/Tannery Way and Peterson Way) are designated as bike routes, due to their low traffic volumes, many of them are conducive to bicycle usage.

Bicycles are also permitted on Central Expressway, Lawrence Expressway, and San Tomas Expressway. However, due to high speeds and traffic volumes, it is recommended for use only by bicyclists of advanced skills.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the project vicinity, sidewalks are provided on both sides of Peterson Way and Tannery Way, as well as along the entire project site frontage on Lakeside Drive. Scott Boulevard, however, has segments with missing sidewalks along the south side of the street between Oakmead Parkway and Oakmead Village Drive in the vicinity of the project site.

Crosswalks are provided on all approaches of all signalized study intersections in the vicinity of the project site, with the exception of the following locations:

- Garrett Drive and Scott Boulevard, west leg of the intersection
- Lakeside Drive and Arques Avenue, west leg of the intersection
- Oakmead Parkway/Corvin Drive, east leg of the intersection

All of the crosswalks at the signalized study intersections include pedestrian signal heads and push buttons. Sidewalks in the project vicinity provide adequate access to the local pedestrian network and the nearby transit facilities.

Existing Transit Service

Existing transit service to the study area is provided by the VTA. The nearest bus stops to the project site are located along Scott Boulevard at Garrett Drive, Oakmead Village Drive, and Lakeside Drive (approximately a half-mile walking distance from the project site), at the intersection of Bowers Avenue and Scott Boulevard (approximately a half-mile walking distance from the project site), and at the intersection of Lawrence Expressway and Arques Avenue (approximately a mile walking distance from

the project site). The VTA bus service is described below and shown on Figure 4. The bus lines that operate within the study area are listed in Table 3.

Local Route 57 operates along Great America Parkway/Bowers Avenue on its route between Old Ironsides/Great America Parkway and West Valley College in Saratoga. Route 57 runs between approximately 5:45 AM and 10:55 PM with 30-minute headways during the AM and PM peak hours. The nearest bus stops to the project site served by Route 57 are located at the Bowers Avenue/Scott Boulevard intersection.

Local Route 58 operates on Bowers Avenue, Scott Boulevard, and Central Expressway in the study area. It runs between West Valley College in Saratoga and Alviso. Route 58 runs between approximately 6:00 AM and 8:15 PM with 30-minute headways during the AM and PM peak hours. The nearest bus stops to the project site served by Route 58 are located at the Bowers Avenue/Scott Boulevard intersection.

Limited-Stop Route 304 provides limited service between the Sunnyvale Transit Center and the Santa Teresa Light Rail Station in San Jose. In the vicinity of the project site, Route 304 operates on Scott Boulevard. Route 304 operates four northbound trips with 30-minute headways during the morning (AM) commute hours and four southbound trips with 30- to 50-minute headways during the evening (PM) commute hours. Route 304 observes all limited stops along its route in the study area. The nearest bus stops to the project site served by Route 304 are located along Scott Boulevard at its intersections with Garrett Drive and Oakmead Village Drive.

Local Route 328 provides limited service between Almaden Expressway in San Jose and the Lockheed Martin Transit Center. In the vicinity of the project site, Route 328 operates on Lawrence Expressway. Route 328 provides a total of four trips per day, two northbound during the morning (AM) commute hours and two southbound during the evening (PM) commute hours. The nearest bus stops to the project site served by Route 328 are located at the intersection of Lawrence Expressway and Arques Avenue.

ACE Gray Shuttle (Route 822) provides limited service from Kifer Road/Wolf Road to the Altamont Corridor Express (ACE) commuter rail at the Great America Station via Arques Avenue/Scott Boulevard near the project site. Service includes four trips with 60-minute headways southbound during the morning (AM) commute hours and four trips with 60-minute headways northbound during the evening (PM) commute hours. The nearest bus stops to the project site served by Route 822 are located along Scott Boulevard at its intersections with Garrett Drive, Lakeside Drive, and Bowers Avenue.

Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were determined by observations in the field and are shown on Figure 5.

Existing Traffic Volumes

Existing peak-hour traffic volumes were obtained from previously completed traffic studies, the 2016 CMP Annual Monitoring Report, and new traffic counts conducted in March 2016. The existing peak-hour intersection volumes are shown on Figure 6. Intersection turning-movement counts conducted for this analysis are presented in Appendix A and peak-hour intersection turning-movement volumes for all intersections and study scenarios are tabulated in Appendix B.

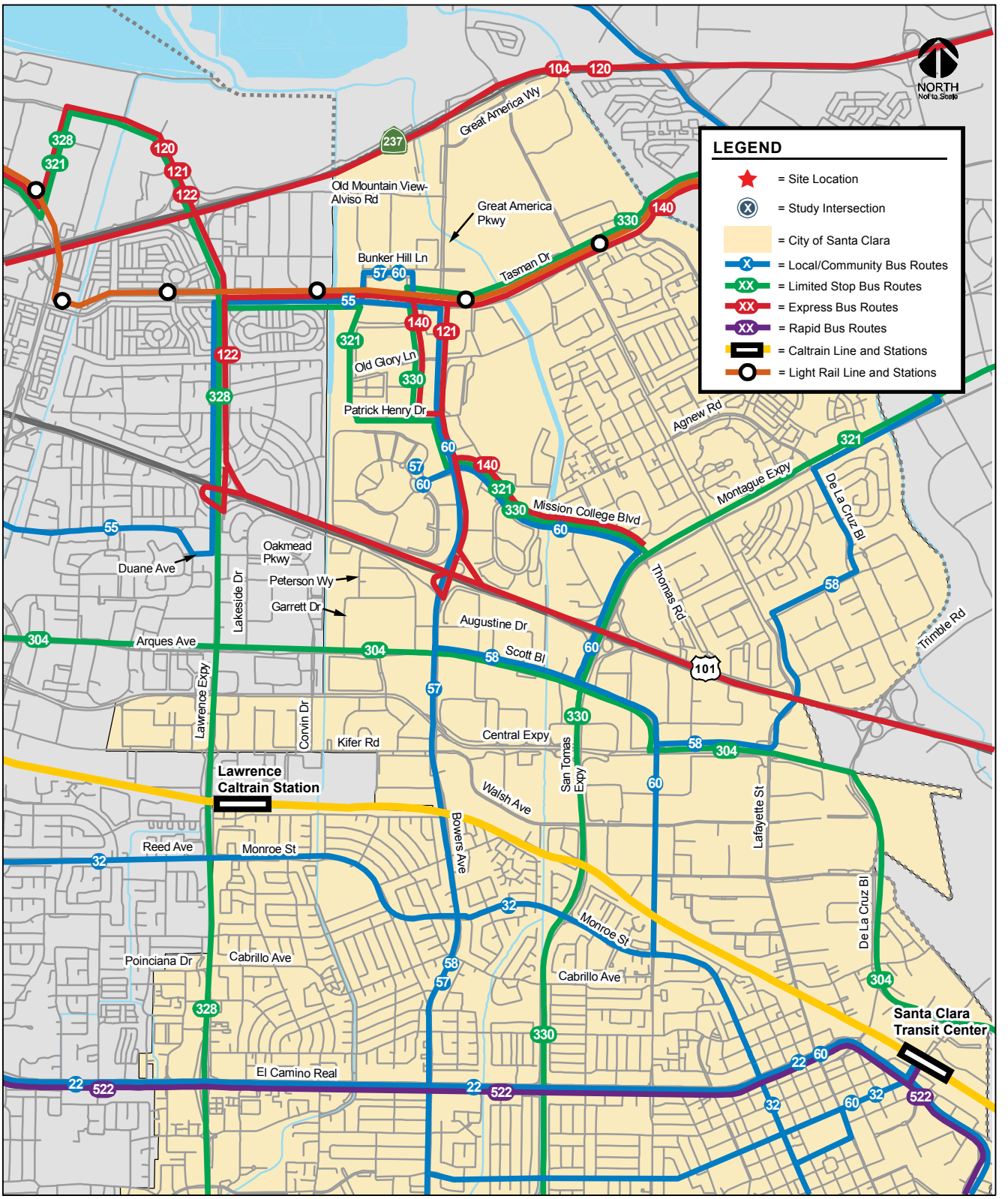


Figure 4
Existing Transit Services

Table 3
Existing Transit Services

Route	Route Description	Weekday	
		Hours of Operation	Headways[1] (minutes)
Bus Routes in the Vicinity of Project Site			
Local Route 57	West Valley College to Great America	5:45 AM - 10:55 PM	30
Local Route 58	West Valley College to Alviso	6:00 AM - 8:15 PM	30
Limited-Stop Route 304[2]	Sunnyvale Transit Center to Santa Teresa Light Rail Station	6:00 AM - 7:00 PM	30 - 50
Limited-Stop Route 328[2]	Almaden Expwy & Camden to Lockheed Martin/Moffett Industrial Park	6:00 AM - 7:15 PM	60 - 90
ACE Gray Line Route 822[2]	ACE Great America Station and South Sunnyvale	6:15 AM - 6:40 PM	60
Other Bus Routes in the Project Area			
Local Route 22	Palo Alto Transit Center to Eastridge Transit Center	24 hours	15
Local Route 32	San Antonio Shopping Center to Santa Clara Transit Center	6:00 AM - 8:30 PM	30
Local Route 55	De Anza College to Great America	5:30 AM - 11:00 PM	30
Local Route 60	Winchester Transit Center to Great America	5:30 AM - 11:00 PM	15
Express Route 121[2]	Gilroy Transit Center to Lockheed Martin Transit Center/Moffett Park	4:30 AM - 7:30 PM	15 - 30
Express Route 122[2]	South San Jose to Lockheed Martin/Moffett Industrial Park	6:00 AM - 6:00 PM	n/a[3]
Express Route 140[2]	Fremont BART to Mission College & Montague Expwy.	7:00 AM- 7:00 PM	45 - 60
Limited-Stop Route 321[2]	Great Mall/Main Transit Center to Lockheed Martin/Moffett Industrial Park	8:00 AM - 6:00 PM	n/a[3]
Limited Stop Route 330[2]	Almaden Expressway/Camden Avenue to Tasman Drive	7:00 AM - 7:30 PM	30 - 60
Rapid Route 522	Palo Alto Transit Center to Eastridge Center	4:45 AM - 11:45 PM	10 - 12

Notes:
Source: VTA Service Schedule, May 2018.
[1] Headways during peak periods.
[2] Limited hours of operation and daily runs.
[3] Single trips during AM and PM peak periods.

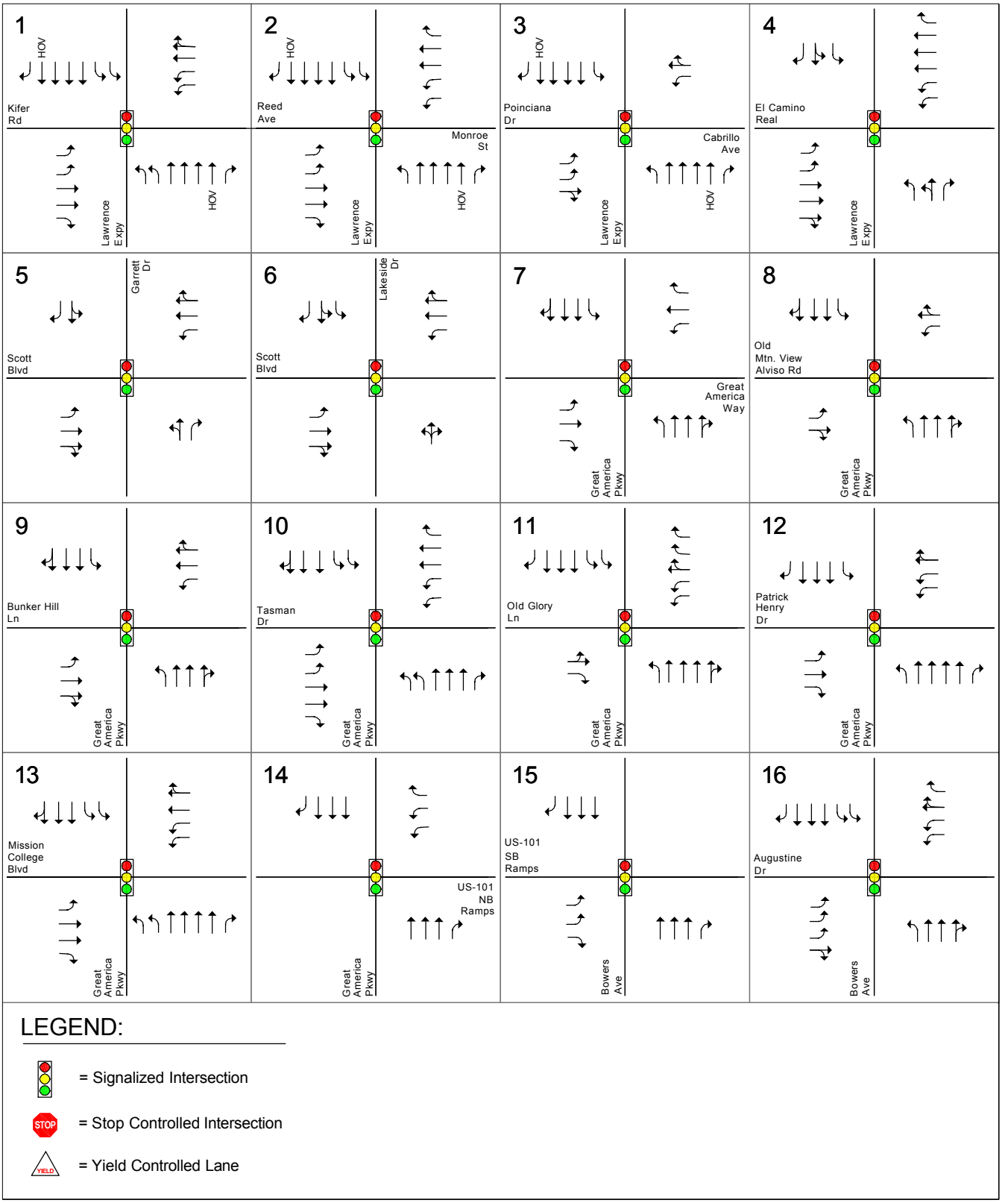


Figure 5
Existing Lane Configurations

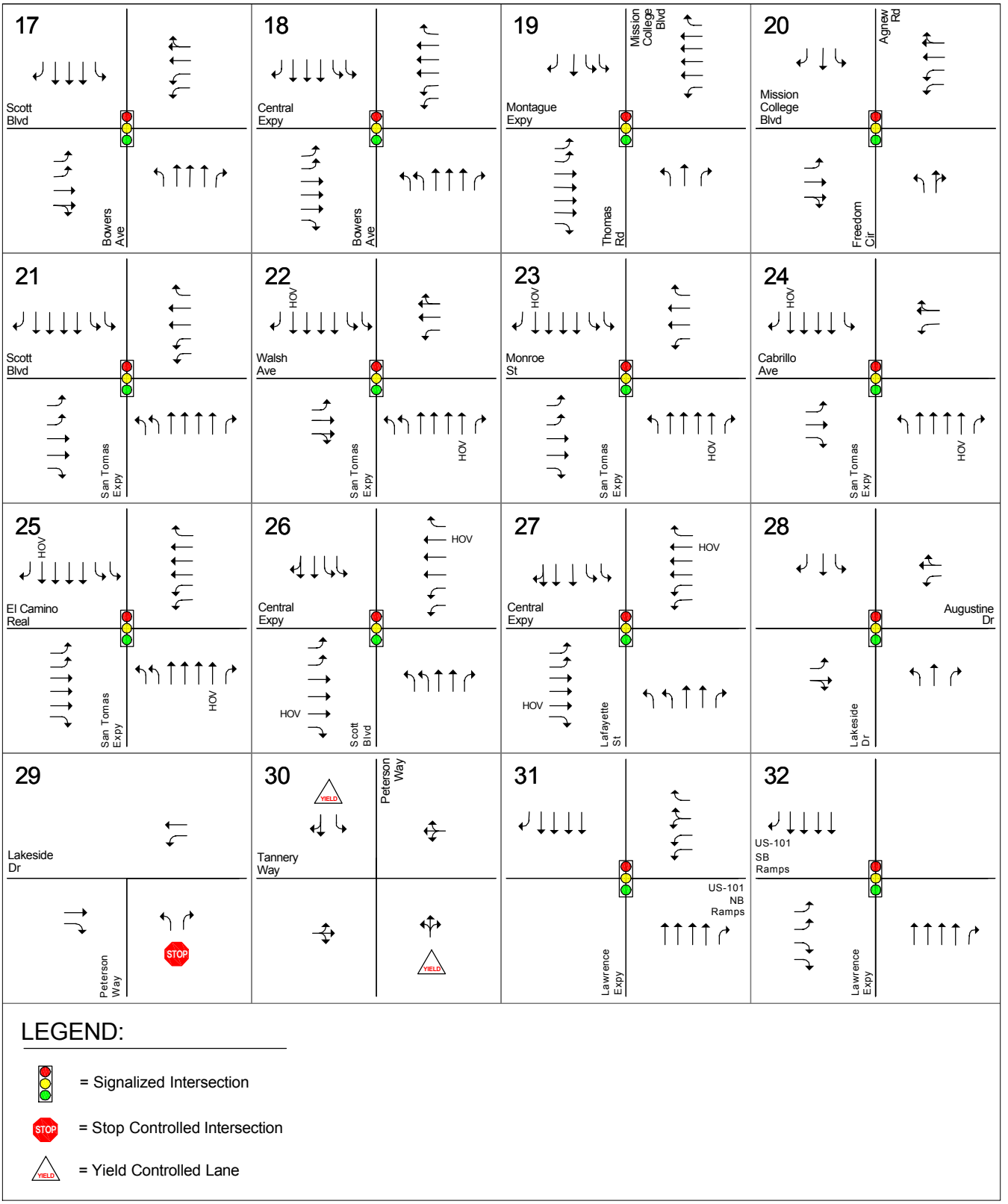
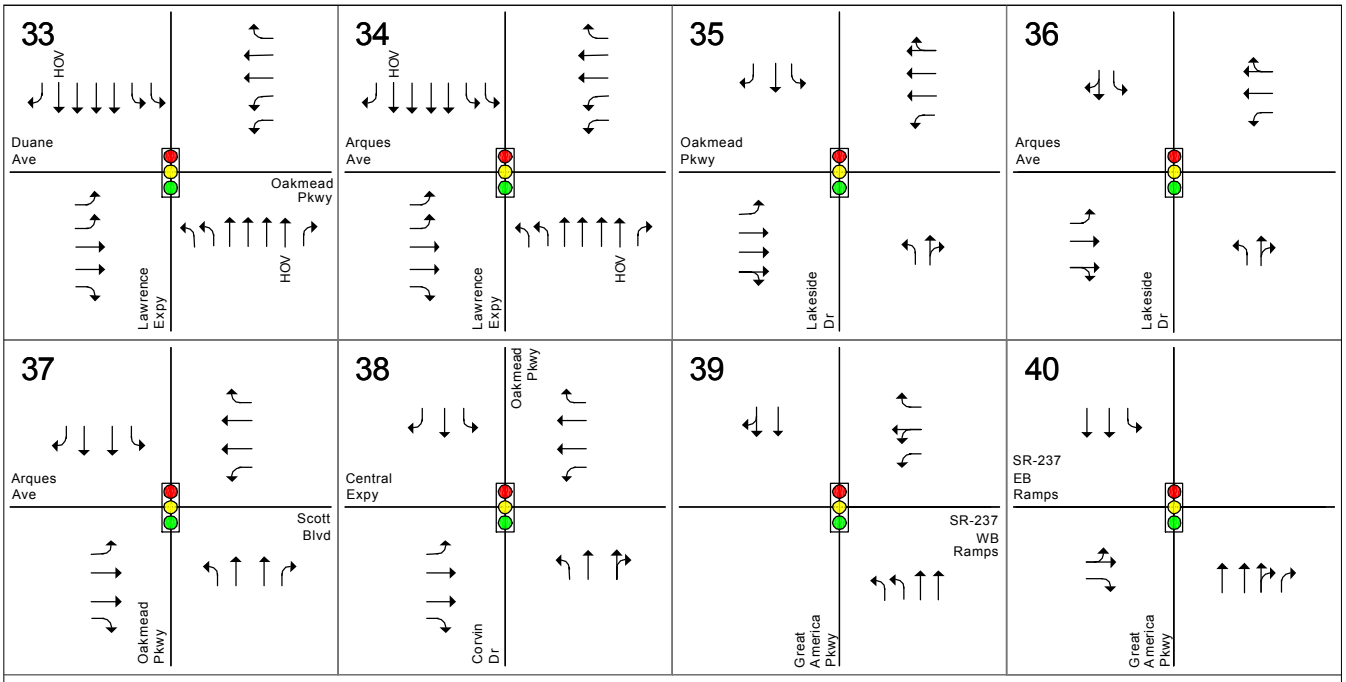


Figure 5 (Continued)
Existing Lane Configurations



LEGEND:

= Signalized Intersection

= Stop Controlled Intersection

= Yield Controlled Lane

Figure 5 (Continued)
Existing Lane Configurations

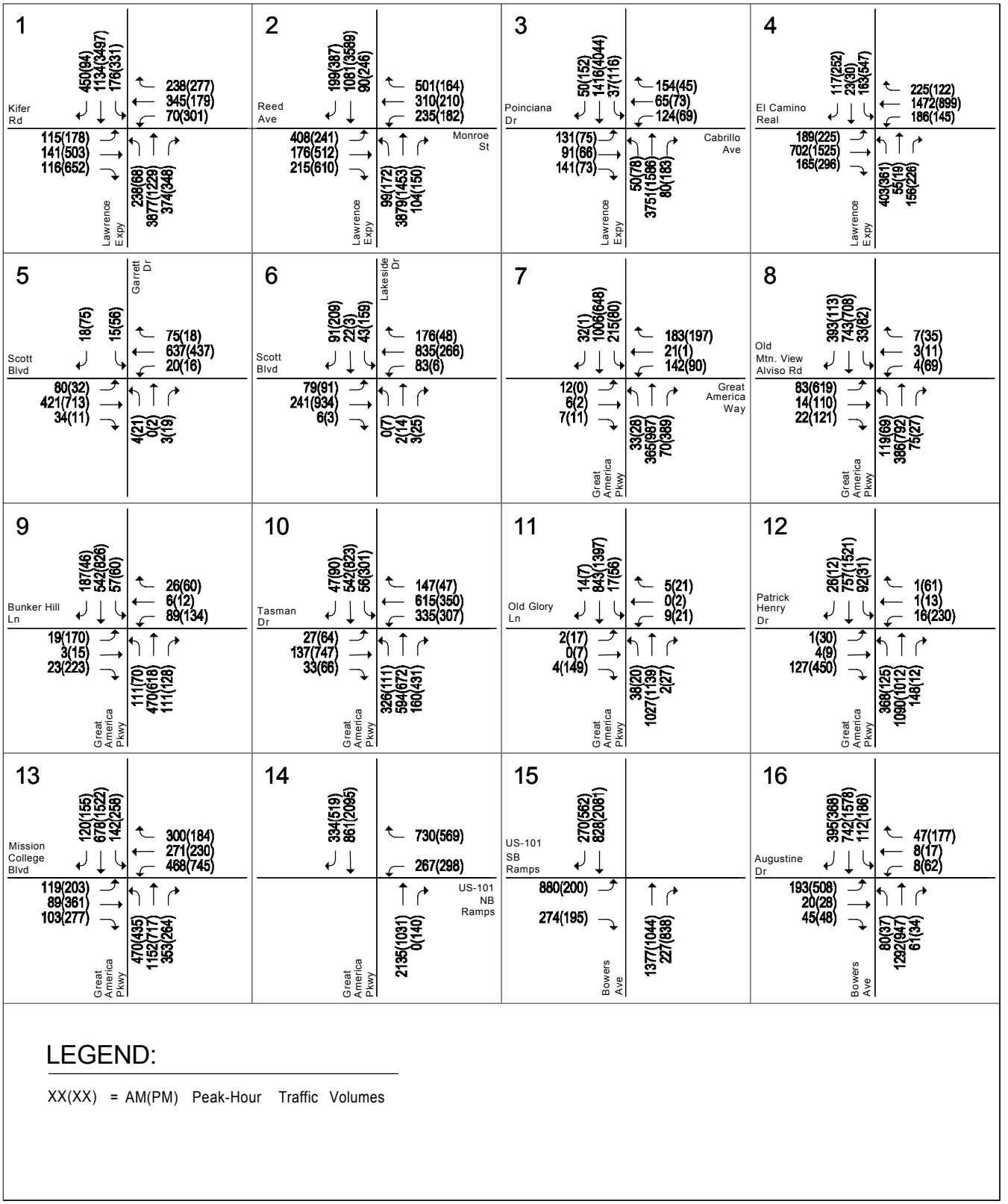


Figure 6
Existing Traffic Volumes

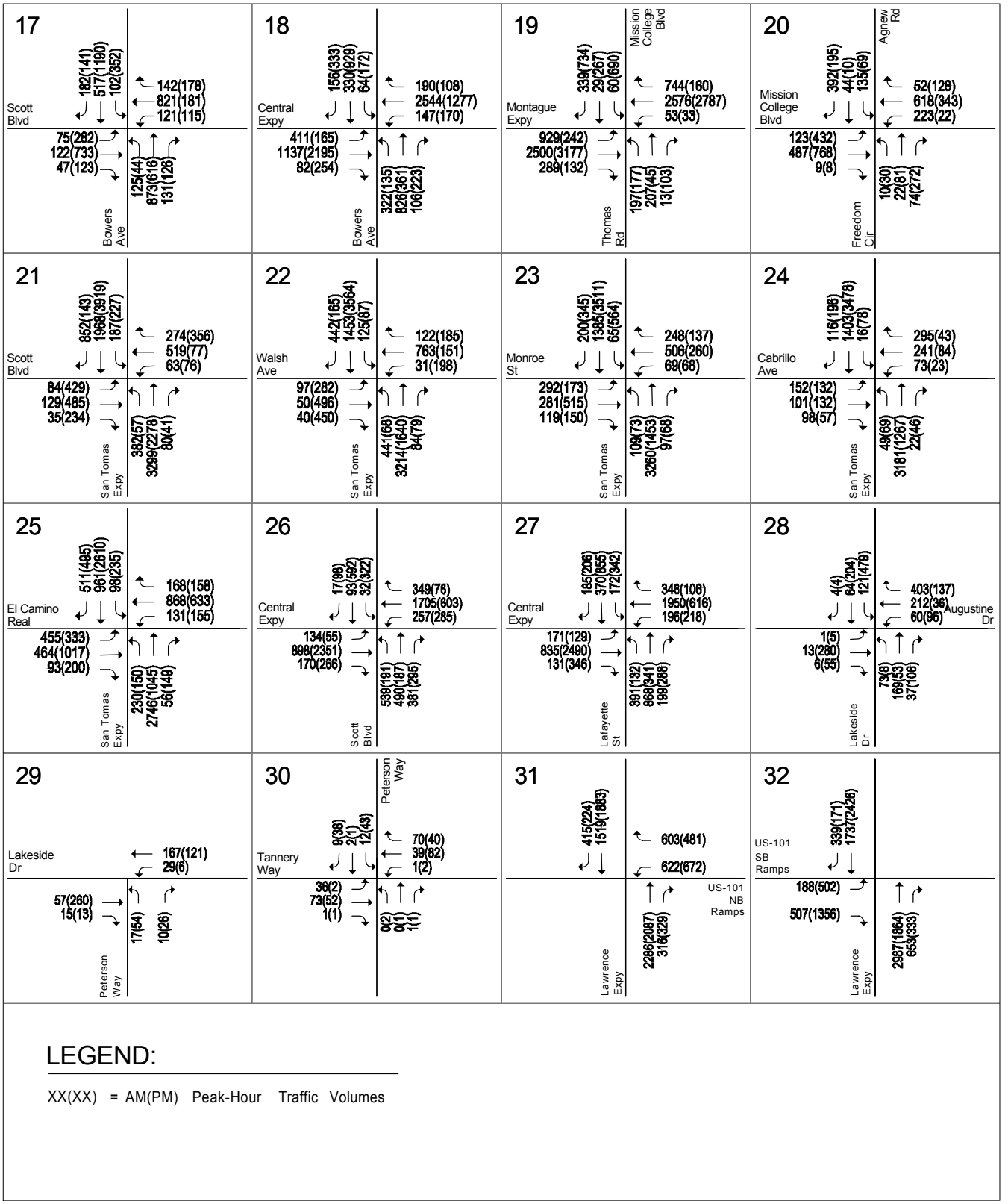
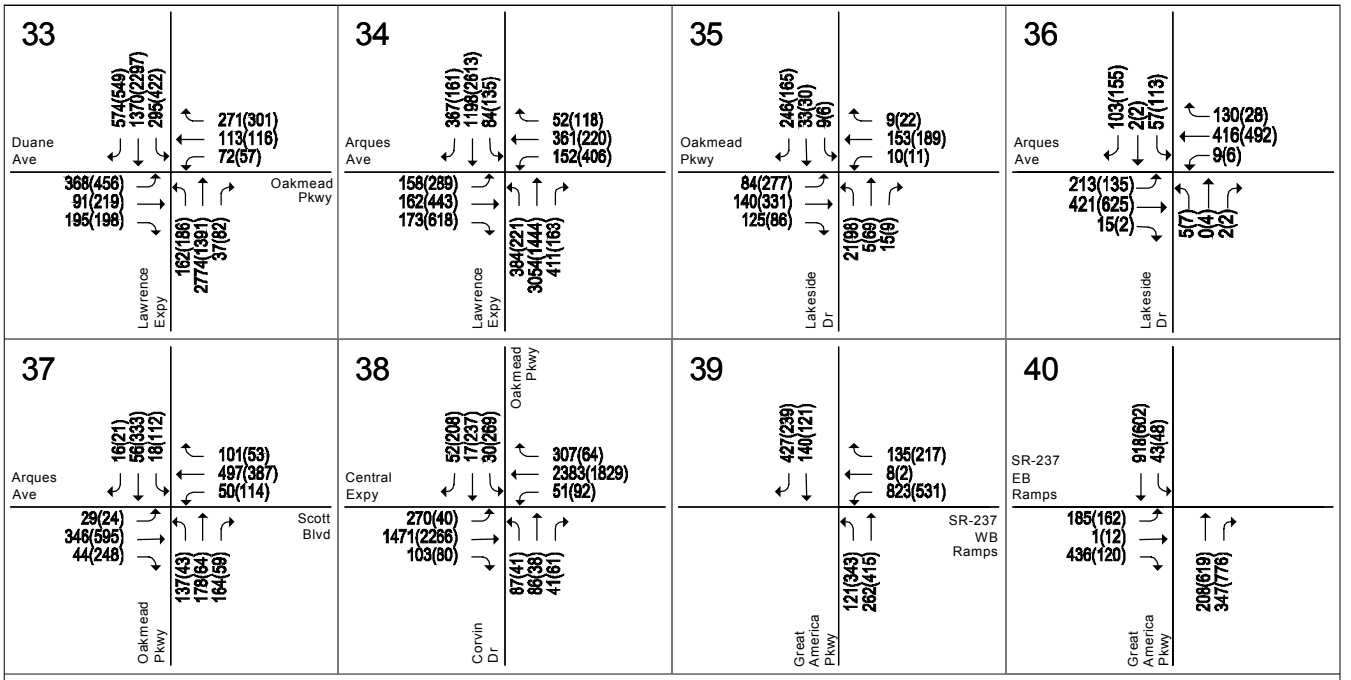


Figure 6 (Continued)
Existing Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 6 (Continued)
Existing Traffic Volumes

Existing Intersection Levels of Service

Intersection levels of service were evaluated against Cities of Santa Clara, San Jose, and Sunnyvale standards. The results of the intersection level of service analysis under existing conditions are summarized in Table 4. The results of the analysis show that, measured against the applicable municipal and CMP level of service standards, the following three signalized study intersections currently operate at an unacceptable level of service (LOS E or worse for locally controlled intersections and LOS F for CMP and expressway intersections) during one of the peak hours analyzed (CMP intersections are denoted with an asterisk*):

City of Santa Clara Intersections

1. Lawrence Expressway and Kifer Road (LOS F – PM peak-hour)
2. Lawrence Expressway and Monroe Street/Reed Avenue* (LOS F – AM peak-hour)
19. Mission College Boulevard/Thomas Road and Montague Expwy* (LOS F – AM peak-hour)

All other study intersections currently operate at an acceptable level of service. The level of service calculation sheets are included in Appendix C.

Unsignalized Intersection Analysis (Traffic Signal Warrants)

For unsignalized study intersections, an assessment is made of the need for signalization of the intersection, based on the Peak-Hour Traffic Signal Warrant (Warrant #3 – Part B) described in the *California Manual on Uniform Traffic Control Devices* (MUTCD), 2014 Edition. This method makes no evaluation of intersection level of service, but simply provides an indication of whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Intersections that meet the peak hour warrant are subject to further analysis before determining that a traffic signal is necessary. The following two unsignalized were evaluated:

29. Peterson Way and Lakeside Drive (City of Santa Clara)
30. Peterson Way and Tannery Way (City of Santa Clara)

The results of the peak-hour traffic signal warrant checks indicate that both of the unsignalized study intersections currently have traffic volumes that fall below the thresholds that warrant signalization. The peak-hour signal warrant sheets are contained in Appendix E.

Existing Freeway Levels of Service

Traffic volumes for the study freeway segments were obtained from the 2016 CMP Annual Monitoring Report, which contains the most recent data collected for freeway segments located in Santa Clara County. The results of the analysis are summarized in Table 5. The results show that mixed-flow lanes on the following 26 directional study freeway segments currently operate at an unacceptable LOS F during one of the peak hours of traffic. The results also show that 25 directional HOV lane segments analyzed currently operate at an unacceptable LOS F during one of the peak hours.

1. Northbound US 101, from I-880 to Old Bayshore Highway
   (AM peak-hour – Mixed-flow and HOV lanes)
2. Northbound US 101, from Old Bayshore Highway to North First Street
   (AM peak-hour – Mixed-flow and HOV lanes)
3. Northbound US 101, from North First Street to Guadalupe Parkway (SR 87)
   (AM peak-hour – Mixed-flow and HOV lanes)

Table 4
Existing Conditions Intersection Levels of Service

Study Number	Intersection	Jurisdiction	LOS Standard	Peak Hour	Count Date	Avg. Delay	LOS
1	Lawrence Expressway and Kifer Road	Santa Clara	E	AM	03/07/18	35.1	D+
				PM	03/07/18	**83.9**	**F**
2	Lawrence Expressway and Monroe Street/Reed Avenue*	Santa Clara	E	AM	03/07/18	**89.2**	**F**
				PM	10/05/16	74.1	E
3	Lawrence Expressway and Cabrillo Avenue	Santa Clara	E	AM	03/07/18	40.6	D
				PM	03/07/18	41.4	D
4	Lawrence Expressway and El Camino Real*	Santa Clara	E	AM	03/07/18	31.9	C
				PM	11/10/16	29.9	C
5	Garrett Drive and Scott Boulevard	Santa Clara	D	AM	08/30/16	7.9	A
				PM	08/30/16	7.8	A
6	Lakeside Drive and Scott Boulevard	Santa Clara	D	AM	08/30/16	12.5	B
				PM	08/30/16	10.9	B+
7	Great America Parkway and Great America Way	Santa Clara	D	AM	01/26/16	22.7	C+
				PM	01/26/16	15.5	B
8	Great America Parkway and Old Mountain View-Alviso Road	Santa Clara	D	AM	01/26/16	20.9	C+
				PM	01/26/16	49.3	D
9	Great America Parkway and Bunker Hill Lane	Santa Clara	D	AM	01/26/16	18.6	B-
				PM	01/26/16	32.2	C-
10	Great America Parkway and Tasman Drive*	Santa Clara	E	AM	03/07/18	42.0	D
				PM	11/17/16	29.5	C
11	Great America Parkway and Old Glory Lane	Santa Clara	D	AM	01/26/16	10.0	A
				PM	01/26/16	14.5	B
12	Great America Parkway and Patrick Henry Drive	Santa Clara	D	AM	01/26/16	26.7	C
				PM	01/26/16	41.2	D
13	Great America Parkway and Mission College Boulevard*	Santa Clara	E	AM	03/07/18	42.9	D
				PM	12/06/16	49.0	D
14	Great America Parkway and US 101 Northbound Ramps*	Santa Clara	E	AM	01/26/16	5.8	A
				PM	11/17/16	8.1	A
15	Bowers Avenue and US 101 Southbound Ramps*	Santa Clara	E	AM	01/26/16	15.7	B
				PM	11/17/16	5.6	A
16	Bowers Avenue and Augustine Drive	Santa Clara	D	AM	08/30/16	18.7	B-
				PM	08/30/16	26.2	C
17	Bowers Avenue and Scott Boulevard*	Santa Clara	E	AM	11/07/17	39.5	D
				PM	11/16/16	34.2	C-
18	Bowers Avenue and Central Expressway*	Santa Clara	E	AM	11/07/17	58.9	E+
				PM	10/05/16	57.3	E+
19	Mission College Boulevard/Thomas Road and Montague Expressway*	Santa Clara	E	AM	11/07/17	**80.7**	**F**
				PM	10/04/16	62.9	E
20	Agnew Road/Freedom Circle and Mission College Boulevard	Santa Clara	D	AM	11/29/16	30.2	C
				PM	11/29/16	32.7	C-
21	San Tomas Expressway and Scott Boulevard*	Santa Clara	E	AM	11/07/17	30.5	C
				PM	10/04/16	55.5	E+
22	San Tomas Expressway and Walsh Avenue	Santa Clara	E	AM	11/07/17	45.5	D
				PM	03/07/18	70.1	E
23	San Tomas Expressway and Monroe Street*	Santa Clara	E	AM	11/07/17	37.0	D+
				PM	10/04/16	45.4	D
24	San Tomas Expressway and Cabrillo Avenue	Santa Clara	E	AM	11/07/17	29.4	C
				PM	03/07/18	35.0	C-
25	San Tomas Expressway and El Camino Real*	Santa Clara	E	AM	11/07/17	70.0	E
				PM	10/04/16	78.3	E-
26	Scott Boulevard and Central Expressway*	Santa Clara	E	AM	11/07/17	40.5	D
				PM	10/04/16	69.7	E
27	Lafayette Street and Central Expressway*	Santa Clara	E	AM	11/07/17	54.3	D-
				PM	10/04/16	68.5	E
28	Lakeside Drive and Augustine Drive	Santa Clara	D	AM	03/07/18	27.8	C
				PM	03/07/18	36.5	D+

Table 4 (Continued)
Existing Conditions Intersection Levels of Service

Study Number	Intersection	Jurisdiction	LOS Standard	Peak Hour	Count Date	Avg. Delay	LOS
31	Lawrence Expressway and US 101 Northbound Ramps	Sunnyvale	E	AM	03/07/18	10.0	A
				PM	03/07/18	12.3	B
32	Lawrence Expressway and US 101 Southbound Ramps	Sunnyvale	E	AM	08/30/16	21.6	C+
				PM	08/30/16	45.7	D
33	Lawrence Expressway and Oakmead Parkway	Sunnyvale	E	AM	03/07/18	36.2	D+
				PM	03/07/18	45.8	D
34	Lawrence Expressway and Arques Avenue*	Sunnyvale	E	AM	08/30/16	41.3	D
				PM	10/04/16	68.1	E
35	Lakeside Drive and Oakmead Parkway	Sunnyvale	D	AM	03/07/18	20.1	C+
				PM	03/07/18	20.1	C+
36	Lakeside Drive and Arques Avenue	Sunnyvale	D	AM	08/30/16	23.7	C
				PM	08/30/16	19.5	B-
37	Oakmead Parkway and Arques Avenue/Scott Boulevard	Sunnyvale	D	AM	08/30/16	21.9	C+
				PM	08/30/16	25.8	C
38	Oakmead Parkway/Corvin Drive and Central Expressway*	Sunnyvale	E	AM	11/07/17	43.1	D
				PM	10/04/16	48.5	D
39	Great America Parkway and SR 237 Westbound Ramps*	San Jose	D	AM	10/12/16	17.8	B
				PM	11/02/16	17.8	B
40	Great America Parkway and SR 237 Eastbound Ramps*	San Jose	D	AM	10/12/16	12.6	B
				PM	11/02/16	10.3	B+

Notes:
* Denotes CMP Intersections
Entries denoted in **bold** indicate conditions that exceed the applicable level of service standard.

Table 5
Existing Conditions Freeway Levels of Service

#	Freeway	Segment	Direction	Peak Hour	Mixed-Flow Lane Avg. Speed[1]	# of Lanes[1]	Volume[1]	Density[1]	LOS[1]	HOV Lane Avg. Speed[1]	# of Lanes[1]	Volume[1]	Density	LOS
1	US 101	from I-880 to Old Bayshore Highway	NB	AM	8	3	3,050	**127**	**F**	15	1	1,470	**98**	**F**
			NB	PM	67	3	3,200	16	B	70	1	840	12	B
2	US 101	from Old Bayshore Highway to North First Street	NB	AM	9	3	3,300	**122**	**F**	12	1	1,300	**108**	**F**
			NB	PM	67	3	3,400	17	B	70	1	560	8	A
3	US 101	from North First Street to Guadalupe Parkway (SR 87)	NB	AM	12	3	3,890	**108**	**F**	11	1	1,210	**110**	**F**
			NB	PM	67	3	2,800	14	B	70	1	630	9	A
4	US 101	from Guadalupe Parkway (SR 87) to De La Cruz Boulevard	NB	AM	8	3	3,050	**127**	**F**	12	1	1,290	**108**	**F**
			NB	PM	66	3	3,770	19	C	70	1	630	9	A
5	US 101	from De La Cruz Boulevard to San Tomas Expressway/Montague Expressway	NB	AM	23	3	5,250	**76**	**F**	26	1	1,850	**71**	**F**
			NB	PM	66	3	4,760	24	C	70	1	770	11	A
6	US 101	from San Tomas Expressway/Montague Expressway to Bowers Avenue/Great America	NB	AM	15	3	4,370	**97**	**F**	19	1	1,640	**86**	**F**
			NB	PM	66	3	5,510	28	D	70	1	770	11	A
7	US 101	from Bowers Avenue/Great America Parkway to Lawrence Expressway	NB	AM	16	3	4,470	**93**	**F**	21	1	1,710	**81**	**F**
			NB	PM	65	3	5,660	29	D	70	1	1,120	16	B
8	US 101	from Lawrence Expressway to North Fair Oaks Avenue	NB	AM	19	3	4,790	**84**	**F**	25	1	1,830	**73**	**F**
			NB	PM	65	3	5,660	29	D	70	1	840	12	B
9	US 101	from North Fair Oaks Avenue to North Mathilda Avenue	NB	AM	33	3	5,940	**60**	**F**	38	1	2,060	54	E
			NB	PM	66	3	4,760	24	C	70	1	770	11	A
10	US 101	from North Mathilda Avenue to SR 237	NB	AM	43	3	6,330	49	E	26	1	1,850	**71**	**F**
			NB	PM	66	3	4,760	24	C	70	1	1,400	20	C
11	SR 237	from Lawrence Expressway to Great America Parkway	EB	AM	64	2	4,100	32	D	67	1	1,210	18	B
			EB	PM	14	2	2,830	**101**	**F**	30	1	2,070	**69**	**F**
12	SR 237	from Great America Parkway to North First Street	EB	AM	64	2	4,100	32	D	66	1	1,390	21	C
			EB	PM	12	2	2,550	**106**	**F**	30	1	1,920	**64**	**F**
13	SR 237	from North First Street to Zanker Road	EB	AM	48	2	4,320	45	D	67	1	1,010	15	B
			EB	PM	25	2	3,600	**72**	**F**	50	1	2,350	47	E
14	SR 237	from Zanker Road to McCarthy Boulevard	EB	AM	66	2	3,670	28	D	67	1	1,010	15	B
			EB	PM	52	2	4,370	42	D	70	1	1,960	28	D
15	SR 237	from McCarthy Boulevard to I-880	EB	AM	66	2	2,860	21	C	67	1	470	7	A
			EB	PM	66	2	2,720	20	C	60	1	2,280	38	D
16	US 101	from SR 237 to North Mathilda Avenue	SB	AM	66	3	4,560	23	C	55	1	2,200	40	D
			SB	PM	18	3	4,700	**87**	**F**	40	1	2,400	**60**	**F**
17	US 101	from North Mathilda Avenue to North Fair Oaks Avenue	SB	AM	66	3	4,760	24	C	67	1	1,210	18	B
			SB	PM	25	3	5,400	**72**	**F**	30	1	2,040	**68**	**F**
18	US 101	from North Fair Oaks Avenue to Lawrence Expressway	SB	AM	66	3	5,510	28	D	67	1	1,140	17	B
			SB	PM	16	3	4,420	**92**	**F**	20	1	2,120	**106**	**F**
19	US 101	from Lawrence Expressway to Bowers Avenue/Great America Parkway	SB	AM	62	3	6,510	35	D	67	1	1,010	15	B
			SB	PM	11	3	3,670	**111**	**F**	20	1	2,040	**102**	**F**
20	US 101	from Bowers Avenue/Great America Parkway to San Tomas Expressway/Montague Expressway	SB	AM	66	3	4,160	21	C	67	1	940	14	B
			SB	PM	12	3	3,890	**108**	**F**	20	1	2,180	**109**	**F**
21	US 101	from San Tomas Expressway/Montague Expressway to De La Cruz Boulevard	SB	AM	66	3	4,950	25	C	67	1	740	11	A
			SB	PM	11	3	3,670	**111**	**F**	30	1	2,130	**71**	**F**
22	US 101	from De La Cruz Boulevard to Guadalupe Parkway (SR 87)	SB	AM	66	3	4,950	25	C	67	1	410	6	A
			SB	PM	40	3	6,240	52	E	70	1	2,520	36	D
23	US 101	from Guadalupe Parkway (SR 87) to North First Street	SB	AM	67	3	3,200	16	B	67	1	210	3	A
			SB	PM	24	3	5,400	**75**	**F**	30	1	2,190	**73**	**F**
24	US 101	from North First Street to Old Bayshore Highway	SB	AM	67	3	2,600	13	B	67	1	140	2	A
			SB	PM	6	3	2,880	**160**	**F**	20	1	2,160	**108**	**F**
25	US 101	from Old Bayshore Highway to I-880	SB	AM	67	3	3,600	18	B	67	1	410	6	A
			SB	PM	6	3	2,450	**136**	**F**	20	1	1,800	**90**	**F**
26	SR 237	from I-880 to McCarthy Boulevard	WB	AM	11	2	2,490	**113**	**F**	29	1	1,890	**65**	**F**
			WB	PM	66	2	2,640	20	C	70	1	630	9	A
27	SR 237	from McCarthy Boulevard to Zanker Road	WB	AM	10	2	2,760	**115**	**F**	24	1	1,780	**74**	**F**
			WB	PM	64	2	4,920	32	D	70	1	1,190	17	B
28	SR 237	from Zanker Road to North First Street	WB	AM	15	2	2,940	**98**	**F**	26	1	1,820	**70**	**F**
			WB	PM	48	2	4,320	45	D	70	1	770	11	A
29	SR 237	from North First Street to Great America Parkway	WB	AM	16	2	2,950	**92**	**F**	19	1	1,600	**84**	**F**
			WB	PM	58	2	4,410	38	D	70	1	980	14	B
30	SR 237	from Great America Parkway to Lawrence Expressway	WB	AM	13	2	2,680	**103**	**F**	20	1	1,640	**82**	**F**
			WB	PM	66	2	3,540	27	D	70	1	1,050	15	B

[1] Source: Santa Clara Valley Transportation Authority Congestion Management Program Monitoring Study, 2016.
Bold indicates unacceptable level of service conditions.

4. Northbound US 101, from Guadalupe Parkway (SR 87) to De La Cruz Boulevard
   (AM peak-hour – Mixed-flow and HOV lanes)
5. Northbound US 101, from De La Cruz Boulevard to San Tomas/Montague Expressway
   (AM peak-hour – Mixed-flow and HOV lanes)
6. Northbound US 101, from San Tomas/Montague Expwy to Bowers Ave/Great America Pkwy
   (AM peak-hour – Mixed-flow and HOV lanes)
7. Northbound US 101, from Bowers Avenue/Great America Parkway to Lawrence Expressway
   (AM peak-hour – Mixed-flow and HOV lanes)
8. Northbound US 101, from Lawrence Expressway to North Fair Oaks Avenue
   (AM peak-hour – Mixed-flow and HOV lanes)
9. Northbound US 101, from North Fair Oaks Avenue to North Mathilda Avenue
   (AM peak-hour – Mixed-flow lanes)
10. Northbound US 101, from North Mathilda Avenue to SR 237
    (AM peak-hour – HOV lane)
11. Eastbound SR 237, from Lawrence Expressway to Great America Parkway
    (PM peak-hour – Mixed-flow and HOV lanes)
12. Eastbound SR 237, from Great America Parkway to North First Street
    (PM peak-hour – Mixed-flow and HOV lanes)
13. Eastbound SR 237, from North First Street to Zanker Road
    (PM peak-hour – Mixed-flow lanes)
16. Southbound US 101, from SR 237 to North Mathilda Avenue
    (PM peak-hour – Mixed-flow and HOV lanes)
17. Southbound US 101, from North Mathilda Avenue to North Fair Oaks Avenue
    (PM peak-hour – Mixed-flow and HOV lanes)
18. Southbound US 101, from North Fair Oaks Avenue to Lawrence Expressway
    (PM peak-hour – Mixed-flow and HOV lanes)
19. Southbound US 101, from Lawrence Expressway to Bowers Avenue/Great America Parkway
    (PM peak-hour – Mixed-flow and HOV lanes)
20. Southbound US 101, from Bowers Ave/Great America Pkwy to San Tomas/Montague Expwy
    (PM peak-hour – Mixed-flow and HOV lanes)
21. Southbound US 101, from San Tomas/Montague Expressway to De La Cruz Boulevard
    (PM peak-hour – Mixed-flow and HOV lanes)
23. Southbound US 101, from Guadalupe Parkway (SR 87) to North First Street
    (PM peak-hour – Mixed-flow and HOV lanes)
24. Southbound US 101, from North First Street to Old Bayshore Highway
    (PM peak-hour – Mixed-flow and HOV lanes)
25. Southbound US 101, from Old Bayshore Highway to I-880
    (PM peak-hour – Mixed-flow and HOV lanes)
26. Westbound SR 237, from I-880 to McCarthy Boulevard
    (AM peak-hour – Mixed-flow and HOV lanes)
27. Westbound SR 237, from McCarthy Boulevard to Zanker Road
    (AM peak-hour – Mixed-flow and HOV lanes)
28. Westbound SR 237, from Zanker Road to North First Street
    (AM peak-hour – Mixed-flow and HOV lanes)
29. Westbound SR 237, from North First Street to Great America Parkway
    (AM peak-hour – Mixed-flow and HOV lanes)
30. Westbound SR 237, from Great America Parkway to Lawrence Expressway
    (AM peak-hour – Mixed-flow and HOV lanes)

Observed Existing Traffic Conditions

Traffic conditions in the field were observed in order to identify existing operational deficiencies and to confirm the accuracy of calculated levels of service. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to intersection level of service, and (2) to identify any locations where the level of service calculation does not accurately reflect level of service in the field.

Overall most study intersections operated adequately during both the AM and PM peak hours of traffic, and the level of service analysis appears to accurately reflect actual existing traffic conditions. However, field observations showed that some operational problems currently occur during the peak commute hours. These issues are described below.

Bowers Avenue and Scott Boulevard

During the AM peak hour, there was occasionally minor spillback on westbound Scott Boulevard that extended from the Lakeside Drive/Scott Boulevard intersection to Bowers Avenue. However, the queue did not cause operational issues at the study intersection due to the coordinated signal timing with adjacent intersections. During the PM peak hour, the southbound left-turn queue extends out of the existing turn pocket. Queues on the eastbound approach extend past the upstream signalized intersection at Lakeside Drive. The eastbound queues often do not clear the intersection in a single signal cycle.

Lakeside Drive and Scott Boulevard

During the AM peak hour, westbound queues extended from the study intersection to the upstream intersection of Bowers Avenue and Scott Boulevard. However, vehicles are able to clear within one signal cycle. During the PM peak hour, congestion on eastbound Scott Boulevard from the downstream signal at Bowers Avenue causes additional delay for the southbound left-turn and the eastbound through movements at Lakeside Drive. Eastbound left-turn queues extend beyond the turn pocket, while the eastbound through queue extends to the upstream intersection at Oakmead Village Drive. However, the congestion did not cause operational issues at the Oakmead Village Drive/Scott Boulevard intersection due to the coordinated signal timing. The eastbound queues often require two signal cycles to clear the intersection, while the southbound left-turn queues clear the intersection within a single signal cycle.

Bowers Avenue and Augustine Drive

No operational issues were observed during the AM peak hour. During the PM peak hour, southbound through vehicles experience additional delay due to downstream congestion. Southbound through and left-turning queues at the Bowers Avenue/Scott Boulevard intersection extend to Augustine Drive. Thus, southbound vehicles require two signal cycles to clear the Bowers Avenue/Augustine Drive intersection.

San Tomas Expressway and Scott Boulevard

During the AM peak hour, the westbound through movement on Scott Boulevard experiences frequent phase failures in which the queue does not clear the intersection in a single signal cycle. During the PM peak hour, the eastbound Scott Boulevard approach experiences queues that overflow the left-turn pocket and extend past the upstream intersection at Olcott Street.

3. Existing Plus Project Conditions

This chapter describes existing traffic conditions with the addition of the traffic that would be generated by the proposed project if the project was complete and operating today. Existing plus project conditions were evaluated relative to existing conditions in order to determine potential deficiencies on the existing transportation network attributable solely to the project. Existing plus project conditions are presented per CEQA requirements to disclose the project's effect on existing conditions.

Included within this chapter is the description of the procedure of estimating project-generated traffic and the resulting traffic conditions under existing plus project conditions.

Transportation Network under Existing Plus Project Conditions

It is assumed in this analysis that the transportation network under existing plus project conditions would be the same as described under existing conditions.

Project Description

The proposed project consists of the construction of two 338,155-square-foot (s.f.) 8-story office buildings with a one-story 13,370 s.f. amenity building (for a total of 689,680 s.f.) and a four-story above grade parking structure at 3625 Peterson Way office in the City of Santa Clara, California. The proposed office building would replace an existing on-site light-industrial building totaling approximately 218,375 s.f. The project site is generally located on the southwest quadrant of the US 101/Bowers Avenue interchange and is bounded by US 101 and Lakeside Drive to the north, Lakeside Drive to the east, Tanner Way to the south, and Peterson Way to the west. Access for the proposed project would be provided via driveway on Peterson Way, Tannery Way, and Lakeside Drive.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. This procedure is explained in more detail in Chapter 5 (Background Plus Project Conditions) of this report.

Trip Generation

Based on the ITE trip generation rates and applicable trip reductions and site trip credits, it is estimated that the proposed project would generate 5,477 net new daily vehicle trips, with 488 trips (416 inbound and 72 outbound) occurring during the AM peak-hour and 539 trips (91 inbound and 448 outbound) occurring during the PM peak-hour.

The project trip generation estimates are presented in Table 8 in Chapter 5.

Trip Assignment and Assignment

The trip distribution pattern for the project was estimated based on existing travel patterns on the surrounding roadway network, the locations of complementary land uses, previous traffic impact reports in the study area, and with the assistance of City staff. Trip distribution and assignment are discussed in detail in Chapter 5.

Existing Plus Project Traffic Volumes

Net project trips associated with the proposed project, as represented in the above project trip assignment, were added to the existing traffic volumes to obtain existing plus project traffic volumes. Existing plus project conditions traffic volumes are shown on Figure 7. Traffic volumes for all components of traffic are tabulated in Appendix B.

Existing Plus Project Intersection Levels of Service

The results of the intersection level of service analysis under existing plus project conditions are summarized in Table 6. The results show that four of the signalized study intersections are projected to operate at an unacceptable level of service (LOS E or worse for locally controlled intersections and LOS F for CMP and expressway intersections) during one of the peak hours analyzed (CMP intersections are denoted with an asterisk*):

City of Santa Clara Intersections

1. Lawrence Expressway and Kifer Road (LOS F – PM peak-hour)
2. Lawrence Expressway and Monroe Street/Reed Avenue* (LOS F – AM peak-hour)

19. Mission College Boulevard/Thomas Road and Montague Expwy* (LOS F – AM peak-hour)
28. Lakeside Drive and Augustine Drive (LOS F – AM and PM peak hours)

Based on City of Santa Clara and CMP level of service standards, the above intersections would be deficient under existing plus project conditions.

Based on the City of Santa Clara significant intersection level of service impact criteria (described in Chapter 5 – Background Plus Project Conditions), the intersection of Lakeside Drive and Augustine Drive (intersection #28) is the only intersection out of the 4 intersections projected to operate deficiently under existing plus project conditions, that would be impacted by the proposed project under existing plus project conditions. The improvement necessary to improve intersection level of service conditions to acceptable conditions at this location would be the same as described under background plus project conditions (modification of the westbound approach to include one shared left-and-through and one right-turn lane, the eastbound approach to include one share left-and-through and one shared right-and-through lane, and changing the signal phasing from protected to split phasing in the eastbound/westbound direction). Project traffic added to the other three deficient intersections would not be sufficient to trigger the LOS impact criteria under existing plus project conditions.

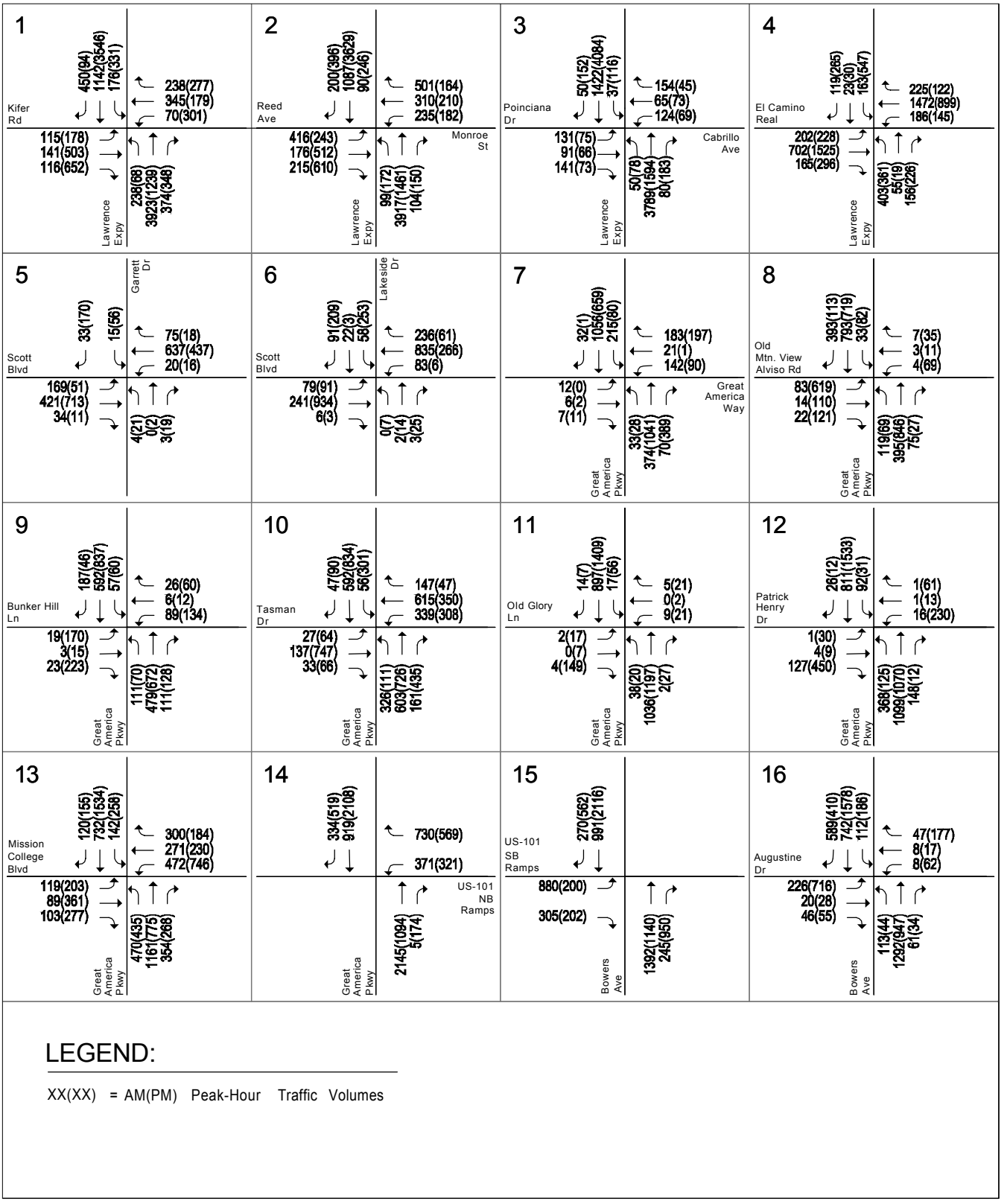


Figure 7
Existing Plus Project Traffic Volumes

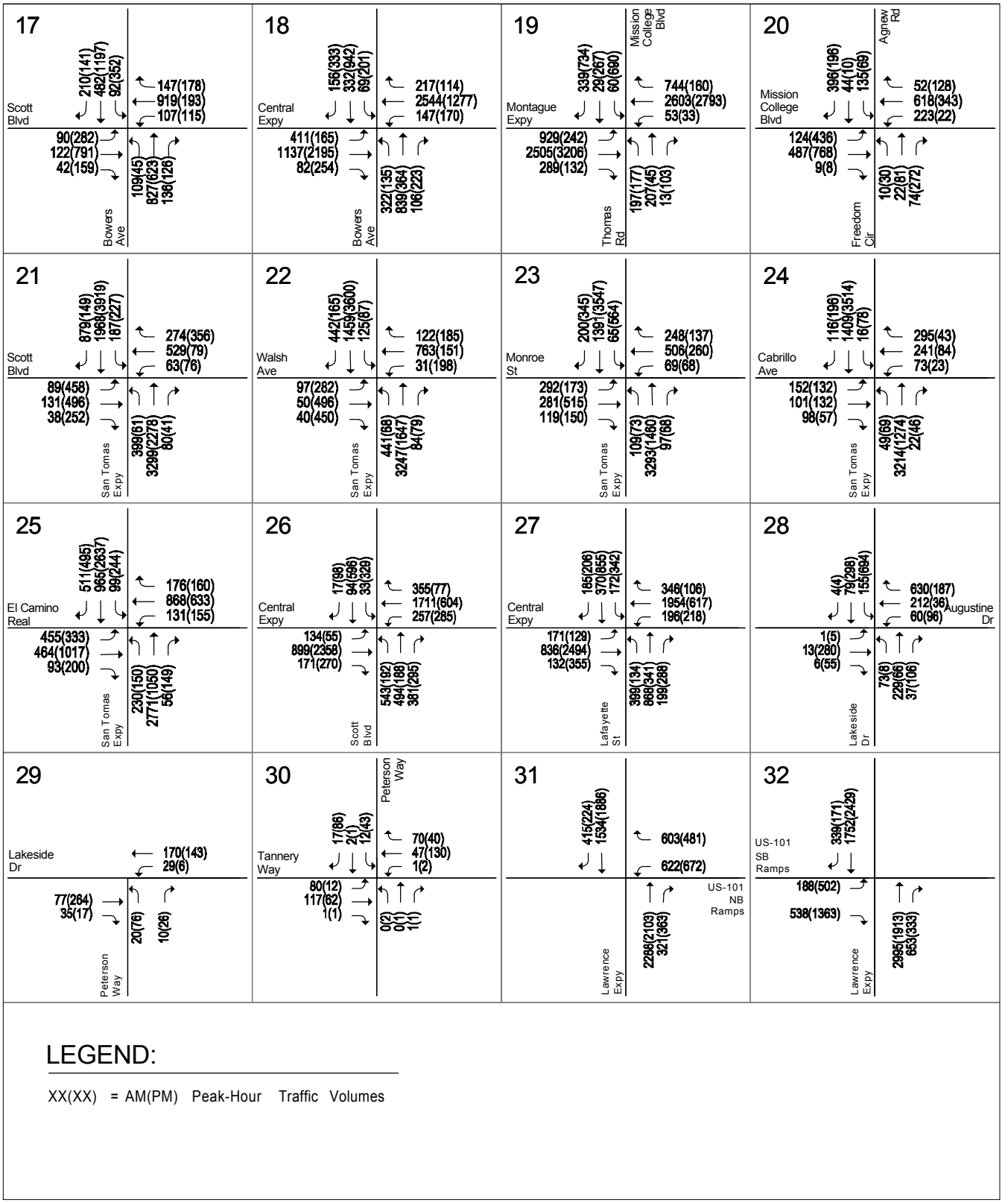
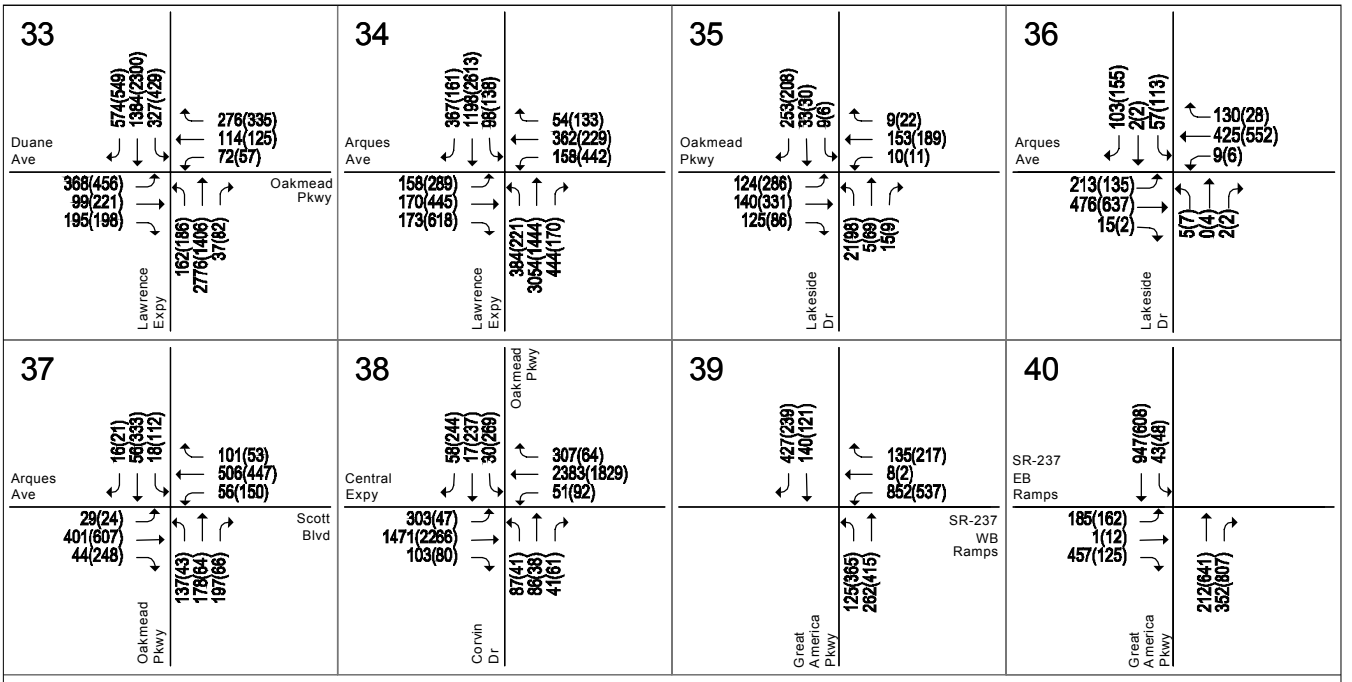


Figure 7 (Continued)
Existing Plus Project Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 7 (Continued)
Existing Plus Project Traffic Volumes

Table 6
Existing Plus Project Conditions Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Existing Avg. Delay	Existing LOS	Existing Plus Project Avg. Delay	Existing Plus Project LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Lawrence Expressway and Kifer Road	E	AM	03/07/18	35.1	D+	36.1	D+	1.6	0.008
			PM	03/07/18	**83.9**	**F**	**84.5**	**F**	-0.2	0.001
2	Lawrence Expressway and Monroe Street/Reed Avenue*	E	AM	03/07/18	**89.2**	**F**	**92.2**	**F**	4.6	0.009
			PM	10/05/16	74.1	E	75.9	E-	3.2	0.006
3	Lawrence Expressway and Cabrillo Avenue	E	AM	03/07/18	40.6	D	41.0	D	0.6	0.006
			PM	03/07/18	41.4	D	42.0	D	0.0	0.001
4	Lawrence Expressway and El Camino Real*	E	AM	03/07/18	31.9	C	32.1	C-	0.4	0.005
			PM	11/10/16	29.9	C	29.9	C	0.0	0.000
5	Garrett Drive and Scott Boulevard	D	AM	08/30/16	7.9	A	10.2	B+	3.6	0.064
			PM	08/30/16	7.8	A	8.6	A	0.0	0.000
6	Lakeside Drive and Scott Boulevard	D	AM	08/30/16	12.5	B	12.6	B	0.2	0.026
			PM	08/30/16	10.9	B+	12.1	B	2.2	0.035
7	Great America Parkway and Great America Way	D	AM	01/26/16	22.7	C+	22.3	C+	-0.3	0.011
			PM	01/26/16	15.5	B	15.4	B	-0.2	0.012
8	Great America Parkway and Old Mountain View-Alviso Road	D	AM	01/26/16	20.9	C+	20.8	C+	-0.1	-0.008
			PM	01/26/16	49.3	D	49.3	D	0.5	0.011
9	Great America Parkway and Bunker Hill Lane	D	AM	01/26/16	18.6	B-	18.1	B-	-0.7	0.011
			PM	01/26/16	32.2	C-	31.9	C	-0.2	0.002
10	Great America Parkway and Tasman Drive*	E	AM	03/07/18	42.0	D	42.1	D	0.1	0.010
			PM	11/17/16	29.5	C	29.6	C	0.1	0.003
11	Great America Parkway and Old Glory Lane	D	AM	01/26/16	10.0	A	9.9	A	0.0	0.002
			PM	01/26/16	14.5	B	14.3	B	0.0	0.002
12	Great America Parkway and Patrick Henry Drive	D	AM	01/26/16	26.7	C	26.8	C	-0.1	0.011
			PM	01/26/16	41.2	D	41.0	D	0.0	0.002
13	Great America Parkway and Mission College Boulevard*	E	AM	03/07/18	42.9	D	42.9	D	0.0	0.010
			PM	12/06/16	49.0	D	48.9	D	0.1	0.003
14	Great America Parkway and US 101 Northbound Ramps*	E	AM	01/26/16	5.8	A	7.6	A	2.1	0.038
			PM	11/17/16	8.1	A	8.6	A	0.6	0.010
15	Bowers Avenue and US 101 Southbound Ramps*	E	AM	01/26/16	15.7	B	15.8	B	0.0	0.003
			PM	11/17/16	5.6	A	5.5	A	-0.1	0.006
16	Bowers Avenue and Augustine Drive	D	AM	08/30/16	18.7	B-	18.4	B-	2.6	0.091
			PM	08/30/16	26.2	C	28.6	C	3.1	0.057
17	Bowers Avenue and Scott Boulevard*	E	AM	11/07/17	39.5	D	40.1	D	0.9	0.023
			PM	11/16/16	34.2	C-	34.7	C-	0.2	0.030
18	Bowers Avenue and Central Expressway*	E	AM	11/07/17	58.9	E+	59.3	E+	-2.8	0.010
			PM	10/05/16	57.3	E+	57.6	E+	0.4	0.010
19	Mission College Boulevard/Thomas Road and Montague Expressway*	E	AM	11/07/17	**80.7**	**F**	**81.1**	**F**	0.6	0.004
			PM	10/04/16	62.9	E	62.9	E	0.1	0.004
20	Agnew Road/Freedom Circle and Mission College Boulevard	D	AM	11/29/16	30.2	C	30.3	C	0.0	0.003
			PM	11/29/16	32.7	C-	32.7	C-	0.1	0.003
21	San Tomas Expressway and Scott Boulevard*	E	AM	11/07/17	30.5	C	31.0	C	0.5	0.006
			PM	10/04/16	55.5	E+	56.5	E+	2.7	0.010
22	San Tomas Expressway and Walsh Avenue	E	AM	11/07/17	45.5	D	45.6	D	-0.1	0.001
			PM	03/07/18	70.1	E	71.1	E	1.5	0.006
23	San Tomas Expressway and Monroe Street*	E	AM	11/07/17	37.0	D+	37.1	D+	0.2	0.005
			PM	10/04/16	45.4	D	45.8	D	0.0	0.001
24	San Tomas Expressway and Cabrillo Avenue	E	AM	11/07/17	29.4	C	29.4	C	-0.1	0.001
			PM	03/07/18	35.0	C-	35.2	D+	0.0	0.001
25	San Tomas Expressway and El Camino Real*	E	AM	11/07/17	70.0	E	70.5	E	0.9	0.005
			PM	10/04/16	78.3	E-	79.5	E-	2.1	0.005
26	Scott Boulevard and Central Expressway*	E	AM	11/07/17	40.5	D	40.6	D	0.1	0.003
			PM	10/04/16	69.7	E	70.3	E	0.6	0.003
27	Lafayette Street and Central Expressway*	E	AM	11/07/17	54.3	D-	54.5	D-	0.2	0.003
			PM	10/04/16	68.5	E	68.5	E	0.1	0.001
28	Lakeside Drive and Augustine Drive	D	AM	03/07/18	27.8	C	**85.4**	**F**	69.9	0.264
			PM	03/07/18	36.5	D+	**81.3**	**F**	67.4	0.182

Table 6 (Continued)
Existing Plus Project Conditions Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Existing Avg. Delay	Existing LOS	Existing Plus Project Avg. Delay	Existing Plus Project LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
31	Lawrence Expressway and US 101 Northbound Ramps	E	AM	03/07/18	10.0	A	10.0	A	0.0	0.000
			PM	03/07/18	12.3	B	12.3	B	0.0	0.002
32	Lawrence Expressway and US 101 Southbound Ramps	E	AM	08/30/16	21.6	C+	25.5	C	6.0	0.011
			PM	08/30/16	45.7	D	46.2	D	1.1	0.003
33	Lawrence Expressway and Oakmead Parkway	E	AM	03/07/18	36.2	D+	37.3	D+	2.3	0.013
			PM	03/07/18	45.8	D	46.0	D	0.2	0.005
34	Lawrence Expressway and Arques Avenue*	E	AM	08/30/16	41.3	D	41.6	D	0.0	0.000
			PM	10/04/16	68.1	E	68.5	E	0.7	0.012
35	Lakeside Drive and Oakmead Parkway	D	AM	03/07/18	20.1	C+	19.1	B-	0.0	0.026
			PM	03/07/18	20.1	C+	19.7	B-	-0.1	0.006
36	Lakeside Drive and Arques Avenue	D	AM	08/30/16	23.7	C	23.2	C	-0.1	0.003
			PM	08/30/16	19.5	B-	19.2	B-	-0.3	0.020
37	Oakmead Parkway and Arques Avenue/Scott Boulevard	D	AM	08/30/16	21.9	C+	22.1	C+	-0.1	0.003
			PM	08/30/16	25.8	C	26.3	C	1.2	0.027
38	Oakmead Parkway/Corvin Drive and Central Expressway*	E	AM	11/07/17	43.1	D	47.1	D	6.7	0.020
			PM	10/04/16	48.5	D	48.8	D	0.0	0.000
39	Great America Parkway and SR 237 Westbound Ramps*	D	AM	10/12/16	17.8	B	17.9	B	0.1	0.011
			PM	11/02/16	17.8	B	17.9	B	0.1	0.010
40	Great America Parkway and SR 237 Eastbound Ramps*	D	AM	10/12/16	12.6	B	12.5	B	-0.1	0.009
			PM	11/02/16	10.3	B+	10.2	B+	-0.2	0.010

Notes:
* Denotes CMP Intersections
Entries denoted in **bold** indicate conditions that exceed the applicable level of service standard.

The remaining signalized study intersection would continue to operate at acceptable levels of service during both peak hours analyzed under existing plus project conditions. The level of service calculation sheets are included in Appendix C.

Unsignalized Intersection Analysis (Traffic Signal Warrants)

The unsignalized study intersections of Peterson Way/Lakeside Drive and Peterson Way/Tannery Way were analyzed for operational purposes, based on the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the California *Manual on Uniform Traffic Control Devices* (MUTCD), 2014 Edition.

The results of the peak-hour traffic signal warrant checks indicate that both of the unsignalized study intersections are projected to have traffic volumes that fall below the thresholds that warrant signalization under existing plus project conditions. The peak-hour signal warrant sheets are contained in Appendix E.

4. Background Conditions

This chapter describes background traffic conditions. Background conditions are defined as conditions just prior to completion of the proposed development. Traffic volumes for background conditions comprise volumes from existing traffic counts plus traffic generated by other approved developments in the vicinity of the project site. This chapter describes the procedure used to determine background traffic volumes and the resulting traffic conditions.

Background Transportation Network

It is assumed in this analysis that the transportation network under background conditions would be the same as the existing transportation network with the exception of the following improvements. The improvements were identified as mitigation measures to be completed by other approved development projects in the study area and/or in the City of Santa Clara Capital Improvement Program (CIP).

7. *Great America Parkway and Great America Way* – Addition of a second westbound right-turn lane with an overlap phase and a second southbound left-turn lane. (City Place)
8. *Great America Parkway and Mountain View-Alviso Road* – Addition of a second eastbound left-turn lane. (City Place)
10. *Great America Parkway and Tasman Drive* – Addition of a southbound right-turn lane and a third westbound left-turn lane. (City Place)
11. *Great America Parkway and Old Glory Lane* – Addition of a second northbound left-turn lane. (Yahoo!)
12. *Great America Parkway and Patrick Henry Drive* – Addition of a second northbound left-turn lane and eastbound free-right-turn lane. The eastbound right-turn lane includes the addition of a fourth southbound lane on Great America Parkway between Patrick Henry Drive and Mission College Boulevard. (Yahoo!)
13. *Great America Parkway and Mission College Boulevard* – Addition of a third westbound left-turn lane, second eastbound left-turn lane, fourth southbound through lane, and third northbound left-turn lane. (CIP)
    Addition of a separate westbound right-turn lane. (Yahoo!)
18. *Bowers Avenue and Central Expressway* – Addition of a third southbound left-turn lane and third eastbound left-turn lane. (City Place)

22. *San Tomas Expressway and Walsh Avenue* – Addition of a second eastbound left-turn lane. (City Place)
32. *Lawrence Expressway and US 101 Southbound Ramps* – Conversion of an eastbound left-turn lane to a shared left-turn/right-turn lane. (City Place)
39. *Great America Parkway and SR-237 Westbound Ramps (N)* – Addition of a third westbound left-turn lane and second westbound right-turn lane. (City Place)
40. *Great America Parkway and SR-237 Eastbound Ramps (S)* – Addition of a third southbound through lane and second eastbound right-turn lane. (City Place)

Background Traffic Volumes

Background peak-hour traffic volumes were estimated by adding to existing volumes the estimated traffic from approved, but not yet constructed, developments. The added traffic from approved but not yet constructed developments was obtained from the City of Santa Clara's TRAFFIX network, which was updated with the latest list of approved projects provided by City staff in November 2017, by applying the same procedure of trip generation, distribution, and assignment described in the next chapter (Chapter 5 – Background Plus Project Conditions). Notable approved projects in the area that are included in the background conditions traffic volumes include the City Place development, Phases 1, 2, and 3 as identified in the project's EIR, the NVIDIA office project on San Tomas Expressway, the Yahoo! office campus on Old Ironsides Drive, and the Santa Clara Square project on Augustine Drive, which is now partially constructed. In addition, traffic generated by Phase 1 of the North San Jose Development Policy (City of San Jose approved project) and approved projects within the City of Sunnyvale also were included in the background traffic volumes. A list of approved projects, dated March 2018, was obtained from City of Sunnyvale staff.

Background traffic volumes are shown on Figure 8. The lists of approved but not yet constructed projects for both the Cities of Santa Clara and Sunnyvale are included in Appendix D. The City of San Jose approved trips (North San Jose Development Policy Phase 1 trips) are listed within the volume summary tables included in Appendix B.

Background Intersection Levels of Service

The results of the intersection level of service analysis under background conditions are summarized in Table 7. The results show that, measured against the applicable municipal and CMP level of service standards, the following 16 signalized study intersections would operate at an unacceptable level of service (LOS E or worse for locally controlled intersections and LOS F for CMP and expressway intersections) during at least one of the peak hours analyzed (CMP intersections are denoted with an asterisk*):

City of Santa Clara Intersections

1. Lawrence Expressway and Kifer Road (LOS F – AM and PM)
2. Lawrence Expressway and Monroe Street/Reed Avenue* (LOS F – AM and PM)
3. Lawrence Expressway and Cabrillo Avenue (LOS F – AM peak-hour)
7. Great America Parkway and Great America Way (LOS F – AM peak-hour)
8. Great America Parkway and Old Mountain View-Alviso Road (LOS E – AM peak-hour)
13. Great America Parkway and Mission College Boulevard* (LOS F – PM peak-hour)
16. Bowers Avenue and Augustine Drive (LOS E – PM peak-hour)
17. Bowers Avenue and Scott Boulevard* (LOS F – AM and PM)
18. Bowers Avenue and Central Expressway* (LOS F – AM and PM)

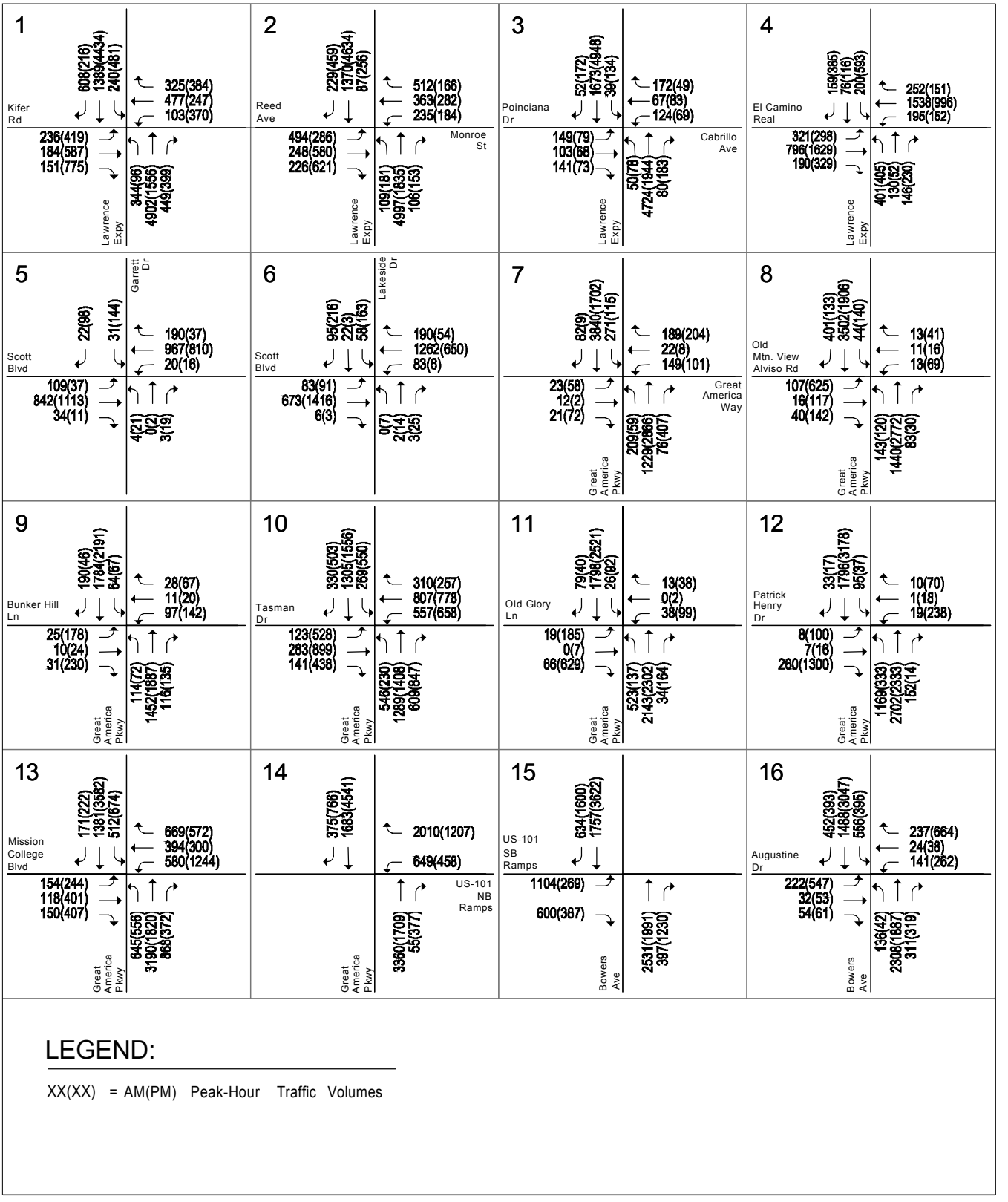
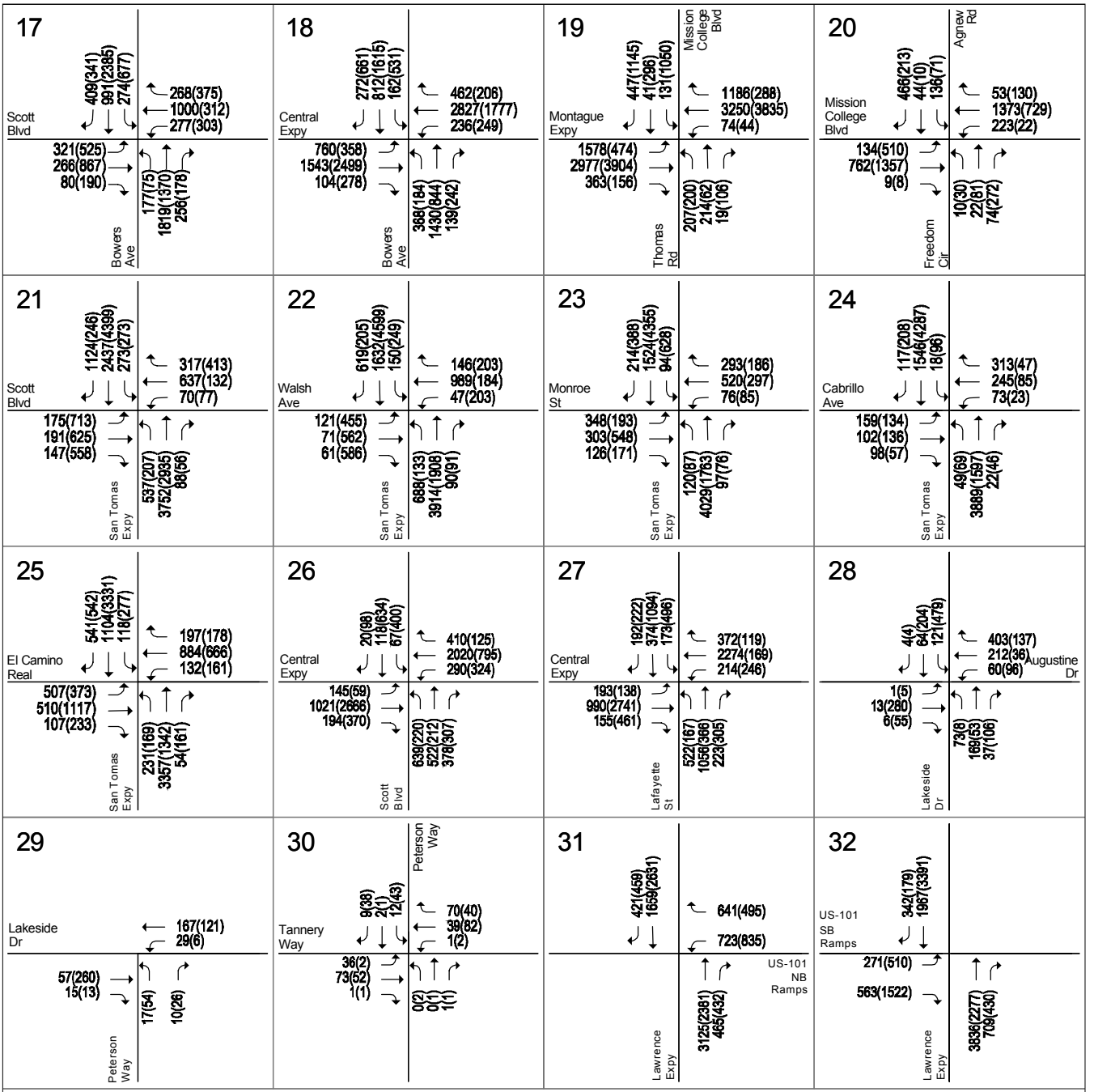


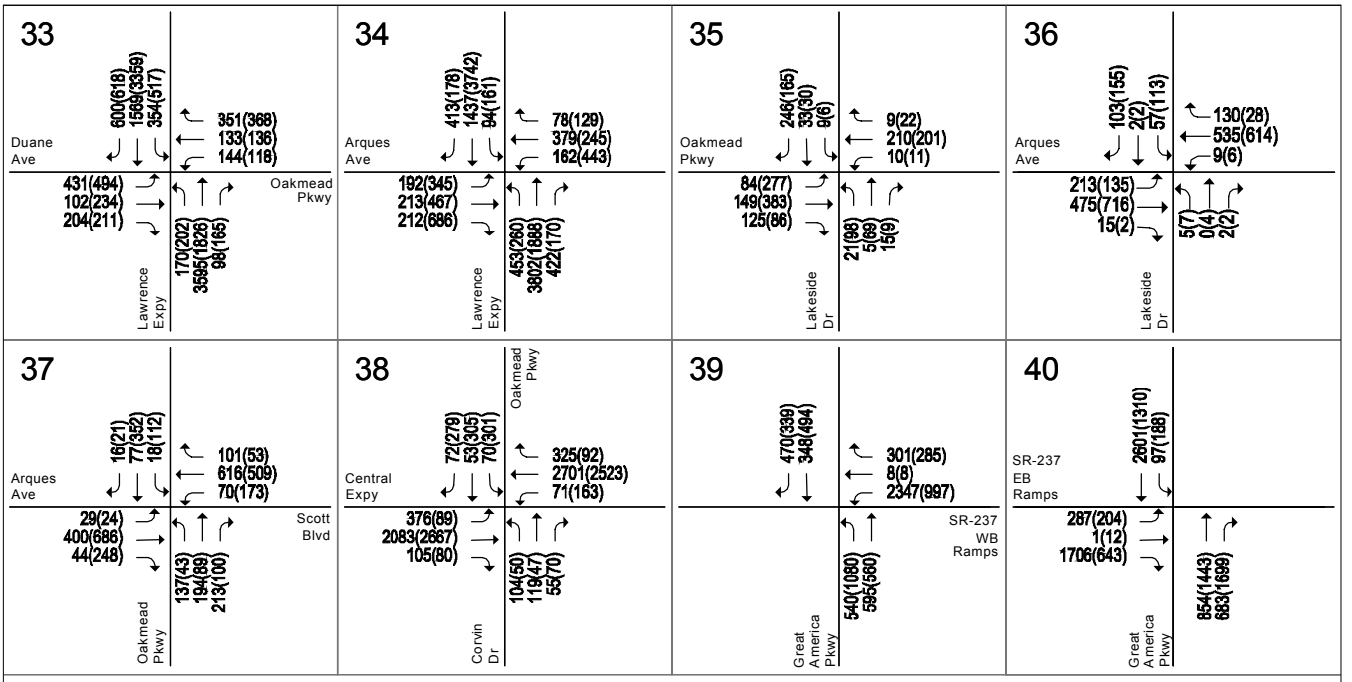
Figure 8
Background Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 8 (Continued)
Background Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 8 (Continued)
Background Traffic Volumes

Table 7
Background Conditions Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Existing Avg. Delay	Existing LOS	Background Avg. Delay	Background LOS
1	Lawrence Expressway and Kifer Road	E	AM	03/07/18	35.1	D+	**99.9**	**F**
			PM	03/07/18	**83.9**	**F**	**128.4**	**F**
2	Lawrence Expressway and Monroe Street/Reed Avenue*	E	AM	03/07/18	**89.2**	**F**	**134.9**	**F**
			PM	10/05/16	74.1	E	**110.6**	**F**
3	Lawrence Expressway and Cabrillo Avenue	E	AM	03/07/18	40.6	D	**80.6**	**F**
			PM	03/07/18	41.4	D	66.6	E
4	Lawrence Expressway and El Camino Real*	E	AM	03/07/18	31.9	C	36.2	D+
			PM	11/10/16	29.9	C	33.5	C-
5	Garrett Drive and Scott Boulevard	D	AM	08/30/16	7.9	A	7.8	A
			PM	08/30/16	7.8	A	9.5	A
6	Lakeside Drive and Scott Boulevard	D	AM	08/30/16	12.5	B	11.2	B+
			PM	08/30/16	10.9	B+	10.5	B+
7	Great America Parkway and Great America Way	D	AM	01/26/16	22.7	C+	**96.1**	**F**
			PM	01/26/16	15.5	B	33.1	C-
8	Great America Parkway and Old Mountain View-Alviso Road	D	AM	01/26/16	20.9	C+	**59.3**	**E+**
			PM	01/26/16	49.3	D	47.2	D
9	Great America Parkway and Bunker Hill Lane	D	AM	01/26/16	18.6	B-	11.4	B+
			PM	01/26/16	32.2	C-	23.3	C
10	Great America Parkway and Tasman Drive*	E	AM	03/07/18	42.0	D	46.1	D
			PM	11/17/16	29.5	C	52.9	D-
11	Great America Parkway and Old Glory Lane	D	AM	01/26/16	10.0	A	17.0	B
			PM	01/26/16	14.5	B	41.1	D
12	Great America Parkway and Patrick Henry Drive	D	AM	01/26/16	26.7	C	33.6	C-
			PM	01/26/16	41.2	D	30.1	C
13	Great America Parkway and Mission College Boulevard*	E	AM	03/07/18	42.9	D	48.1	D
			PM	12/06/16	49.0	D	81.0	F
14	Great America Parkway and US 101 Northbound Ramps*	E	AM	01/26/16	5.8	A	12.9	B
			PM	11/17/16	8.1	A	22.6	C+
15	Bowers Avenue and US 101 Southbound Ramps*	E	AM	01/26/16	15.7	B	19.0	B-
			PM	11/17/16	5.6	A	6.5	A
16	Bowers Avenue and Augustine Drive	D	AM	08/30/16	18.7	B-	39.9	D
			PM	08/30/16	26.2	C	**57.5**	**E+**
17	Bowers Avenue and Scott Boulevard*	E	AM	11/07/17	39.5	D	**91.8**	**F**
			PM	11/16/16	34.2	C-	**80.4**	**F**
18	Bowers Avenue and Central Expressway*	E	AM	11/07/17	58.9	E+	**84.4**	**F**
			PM	10/05/16	57.3	E+	**102.6**	**F**
19	Mission College Boulevard/Thomas Road and Montague Expressway*	E	AM	11/07/17	**80.7**	**F**	**176.6**	**F**
			PM	10/04/16	62.9	E	**144.7**	**F**
20	Agnew Road/Freedom Circle and Mission College Boulevard	D	AM	11/29/16	30.2	C	30.8	C
			PM	11/29/16	32.7	C-	35.0	C-
21	San Tomas Expressway and Scott Boulevard*	E	AM	11/07/17	30.5	C	43.8	D
			PM	10/04/16	55.5	E+	**90.1**	**F**
22	San Tomas Expressway and Walsh Avenue	E	AM	11/07/17	45.5	D	**79.0**	**E-**
			PM	03/07/18	70.1	E	**129.1**	**F**
23	San Tomas Expressway and Monroe Street*	E	AM	11/07/17	37.0	D+	56.5	E+
			PM	10/04/16	45.4	D	78.1	E-
24	San Tomas Expressway and Cabrillo Avenue	E	AM	11/07/17	29.4	C	34.0	C-
			PM	03/07/18	35.0	C-	40.9	D
25	San Tomas Expressway and El Camino Real*	E	AM	11/07/17	70.0	E	**98.5**	**F**
			PM	10/04/16	78.3	E-	**121.9**	**F**
26	Scott Boulevard and Central Expressway*	E	AM	11/07/17	40.5	D	44.4	D
			PM	10/04/16	69.7	E	**85.4**	**F**
27	Lafayette Street and Central Expressway*	E	AM	11/07/17	54.3	D-	74.4	E
			PM	10/04/16	68.5	E	**111.5**	**F**
28	Lakeside Drive and Augustine Drive	D	AM	03/07/18	27.8	C	27.8	C
			PM	03/07/18	36.5	D+	36.5	D+

Table 7 (Continued)
Background Conditions Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Existing Avg. Delay	Existing LOS	Background Avg. Delay	Background LOS
31	Lawrence Expressway and US 101 Northbound Ramps	E	AM	03/07/18	10.0	A	10.5	B+
			PM	03/07/18	12.3	B	12.6	B
32	Lawrence Expressway and US 101 Southbound Ramps	E	AM	08/30/16	21.6	C+	13.8	B
			PM	08/30/16	45.7	D	27.6	C
33	Lawrence Expressway and Oakmead Parkway	E	AM	03/07/18	36.2	D+	56.3	E+
			PM	03/07/18	45.8	D	53.7	D-
34	Lawrence Expressway and Arques Avenue*	E	AM	08/30/16	41.3	D	48.9	D
			PM	10/04/16	68.1	E	**108.1**	**F**
35	Lakeside Drive and Oakmead Parkway	D	AM	03/07/18	20.1	C+	20.3	C+
			PM	03/07/18	20.1	C+	20.2	C+
36	Lakeside Drive and Arques Avenue	D	AM	08/30/16	23.7	C	22.7	C+
			PM	08/30/16	19.5	B-	17.9	B
37	Oakmead Parkway and Arques Avenue/Scott Boulevard	D	AM	08/30/16	21.9	C+	21.7	C+
			PM	08/30/16	25.8	C	26.3	C
38	Oakmead Parkway/Corvin Drive and Central Expressway*	E	AM	11/07/17	43.1	D	78.6	E-
			PM	10/04/16	48.5	D	79.9	E-
39	Great America Parkway and SR 237 Westbound Ramps*	D	AM	10/12/16	17.8	B	48.3	D
			PM	11/02/16	17.8	B	27.9	C
40	Great America Parkway and SR 237 Eastbound Ramps*	D	AM	10/12/16	12.6	B	12.7	B
			PM	11/02/16	10.3	B+	12.6	B

Notes:
* Denotes CMP Intersections
Entries denoted in **bold** indicate conditions that exceed the applicable level of service standard.

19. Mission College Boulevard/Thomas Road and Montague Expwy* (LOS F – AM and PM)
21. San Tomas Expressway and Scott Boulevard* (LOS F – PM peak-hour)
22. San Tomas Expressway and Walsh Avenue (LOS E – AM, LOS F – PM)
25. San Tomas Expressway and El Camino Real* (LOS F – AM and PM)
26. Scott Boulevard and Central Expressway* (LOS F – PM peak-hour)
27. Lafayette Street and Central Expressway* (LOS F – PM peak-hour)

City of Sunnyvale Intersection

34. Lawrence Expressway and Arques Avenue* (LOS F – PM peak-hour)

The remaining study signalized intersections would operate at an acceptable level of service. The level of service calculation sheets are included in Appendix C.

Unsignalized Intersection Analysis (Traffic Signal Warrants)

The unsignalized study intersections of Peterson Way/Lakeside Drive and Peterson Way/Tannery Way were analyzed for operational purposes, based on the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the California *Manual on Uniform Traffic Control Devices* (MUTCD), 2014 Edition.

The results of the peak-hour traffic signal warrant checks indicate that both of the unsignalized study intersections are projected to have traffic volumes that fall below the thresholds that warrant signalization under background conditions. The peak-hour signal warrant sheets are contained in Appendix E.

5.
Background Plus Project Conditions

This chapter describes background plus project traffic conditions, significant project impacts, and measures that are recommended to mitigate project impacts. Included are descriptions of the significance criteria used to establish what constitutes a project impact, the method by which project traffic is estimated, identification of the impacts, and descriptions of the mitigation measures. Background plus project conditions are represented by background traffic conditions (existing plus approved traffic) with the addition of traffic generated by the proposed project. Background plus project conditions were evaluated relative to background conditions in order to determine potential project impacts.

Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. Impacts on intersections are based on the significance criteria and thresholds of the jurisdiction in which the intersection is located. For this analysis, significance criteria for impacts on intersections are based on the Cities of Santa Clara, Sunnyvale, and San Jose, and the Santa Clara County Congestion Management Program (CMP) Level of Service standards. Project impacts also were analyzed according to the CMP methodology for the study freeway segments.

Project impacts on other transportation facilities, such as bicycle facilities and transit, were determined on the basis of engineering judgment.

Cities of Santa Clara and Sunnyvale Definition of Significant Intersection LOS Impacts

According to the Cities of Santa Clara and Sunnyvale level of service guidelines, a development is said to create a significant adverse impact on traffic conditions at a non-CMP signalized intersection if for either peak hour:

1. The level of service at the intersection degrades from an acceptable level (LOS D or better at all city-controlled intersections and LOS E or better at all expressway intersections) under background conditions to an unacceptable level (LOS E or F at city-controlled intersections and LOS F at expressway intersections) under project conditions, or
2. The level of service at the intersection is an unacceptable level (LOS E or F at city-controlled intersections and LOS F at expressway intersections) under background conditions and the addition of project trips causes the average critical delay to increase by four (4) or more seconds *and* the volume-to-capacity ratio (V/C) to increase by one percent (0.01) or more.

An exception to this rule applies when the addition of project traffic reduces the amount of average delay for critical movements (i.e., the change in average delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by 0.01 or more.

A significant impact by the Cities of Santa Clara and Sunnyvale standards is said to be satisfactorily mitigated when measures are implemented that would restore intersection level of service to an acceptable level or no worse than background conditions.

City of San Jose Definition of Significant Intersection LOS Impacts

The project is said to create a significant adverse impact on traffic conditions at a signalized intersection in the City of San Jose if for either peak hour:

1. The level of service at the intersection degrades from an acceptable LOS D or better under background conditions to an unacceptable LOS E or F under background plus project conditions, or
2. The level of service at the intersection is an unacceptable LOS E or F under background conditions and the addition of project trips causes both the critical-movement delay at the intersection to increase by four (4) or more seconds *and* the volume-to-capacity ratio (V/C) to increase by one percent (.01) or more.

An exception to this rule applies when the addition of project traffic reduces the amount of average stopped delay for critical movements (i.e., the change in average stopped delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by 0.01 or more.

A significant impact by City of San Jose standards is said to be satisfactorily mitigated when measures are implemented that would restore intersection level of service to background conditions or better.

CMP Definition of Significant Intersection LOS Impacts

The definition of a significant impact at a CMP intersection is the same as for the Cities of Santa Clara and Sunnyvale, except that the CMP standard for acceptable level of service at a CMP intersection is LOS E or better. A significant impact by CMP standards is said to be satisfactorily mitigated when measures are implemented that would restore intersection conditions to an acceptable level or no worse than background conditions.

CMP Definition of Significant Freeway Segment Impacts

The CMP defines an acceptable level of service for freeway segments as LOS E or better. A project is said to create a significant impact on traffic conditions on a freeway segment if for either peak hour:

1. The level of service on the freeway segment degrades from an acceptable LOS E or better under existing conditions to an unacceptable LOS F under existing plus project conditions, or
2. The level of service on the freeway segment is LOS F under existing plus project conditions and the number of project trips on that segment constitutes at least one percent of capacity on that segment.

A significant impact by CMP standards is said to be satisfactorily mitigated when measures are implemented that would restore freeway conditions to background conditions or better.

Transportation Network under Background Plus Project Conditions

It is assumed in this analysis that the transportation network under background plus project conditions would be the same as described under background conditions.

Project Description

The proposed project consists of the construction of two 338,155-square-foot (s.f.) 8-story office buildings with a one-story 13,370 s.f. amenity building (for a total of 689,680 s.f.) and a four-story above grade parking structure at 3625 Peterson Way office in the City of Santa Clara, California. The proposed office building would replace an existing on-site light-industrial building totaling approximately 218,375 s.f. The project site is generally located on the southwest quadrant of the US 101/Bowers Avenue interchange and is bounded by US 101 and Lakeside Drive to the north, Lakeside Drive to the east, Tanner Way to the south, and Peterson Way to the west. Access for the proposed project would be provided via driveway on Peterson Way, Tannery Way, and Lakeside Drive.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear were estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. These procedures are described below.

Trip Generation

Through empirical research, data have been collected that correlate to common land uses their propensity for producing traffic. Thus, for the most common land uses there are standard trip generation rates that can be applied to help predict the future traffic increases that would result from a new development. Project trip estimates are based on trip generation rates obtained from the Institute of Transportation Engineers' (ITE's) *Trip Generation*, Tenth Edition, 2017.

Project trip generation was estimated by applying to the size of the proposed development the applicable ITE trip generation rates. Based on ITE trip generation rates for General Office Building (land use #710), it is estimated that the proposed project would generate 6,906 gross daily trips with 675 trips occurring during the AM peak-hour and 713 trips occurring during the PM peak-hour (see Table 8).

The City's Climate Action Plan states that the project must achieve a minimum 10 percent reduction in vehicle miles travelled through the implementation of a Transportation Demand Management (TDM) program. However, VTA guidelines allow traffic analyses to assume a maximum trip reduction of five percent for a TDM plan with financial incentives. The applicant will submit a TDM plan that complies with the City's requirements prior to the issue of a building occupancy permit. Therefore, the project trip estimates include a five percent trip reduction for TDM.

Existing Land Use

Trip credit for the existing uses on site also was applied to the estimated trips for the proposed project, since traffic generated by the existing uses, and currently on the roadway network, would no longer access the project site once the proposed project is built. Traffic generated by the existing uses on site was estimated in a similar manner as the proposed project traffic. Based on ITE trip generation rates for

Table 8
Project Trip Generation Estimates

Land Use	ITE Land Use Code	Size	Daily Trip Rate	Daily Trips	AM Peak Hour (7-9AM) Pk-Hr Factor	AM Splits In	AM Splits Out	AM Trips In	AM Trips Out	AM Trips Total	PM Peak Hour (4-6PM) Pk-Hr Factor	PM Splits In	PM Splits Out	PM Trips In	PM Trips Out	PM Trips Total
Proposed Land Use																
General Office Building (equation)	710	689,680 s.f.	10.013	6,906	0.978	86%	14%	580	95	675	1.034	16%	84%	114	599	713
TDM Reduction (5%)				-345				-29	-5	-34				-6	-30	-36
Total Proposed Trips				6,560				551	90	641				108	569	677
Existing Land Use																
General Light Industrial (average)	110	218,375 s.f.	4.96	-1,083	0.700	88%	12%	-135	-18	-153	0.630	13%	87%	-17	-121	-138
Credit for Existing Uses				-1,083				-135	-18	-153				-17	-121	-138
Net Project Trips				**5,477**				**416**	**72**	**488**				**91**	**448**	**539**

Source: ITE Trip Generation Manual, 10th Edition 2017

General Light Industrial (land use #110), the existing uses on-site were estimated to generate approximately 153 AM peak-hour trips and 138 PM peak-hour trips.

The trip generation estimates for the existing building were verified based on field observations. Field observations conducted at the project site in May 2018 revealed that approximately 225 vehicles were parked on site by 8:45 AM, confirming that the trip generation estimates for the existing uses are adequate and possibly conservative.

The existing site-generated traffic was subtracted from the project traffic estimates to obtain the net increase in traffic associated with the proposed project.

Net Project Trips

After the applicable TDM reduction and subtracting the trips associated with the existing building, the proposed project is estimated to generate 5,477 net new daily vehicle trips, with 488 trips (416 inbound and 72 outbound) occurring during the AM peak-hour and 539 trips (91 inbound and 448 outbound) occurring during the PM peak-hour (see Table 8).

Trip Distribution and Assignment

The trip distribution pattern for the project was estimated based on existing travel patterns on the surrounding roadway network, the locations of complementary land uses, and previous traffic impact reports in the study area. The trip distribution pattern for the project is shown on Figure 9.

The peak-hour trips generated by the project were assigned to the roadway network in accordance with the project trip distribution pattern. Traffic associated with the existing building on site was assigned to the roadway network as negative trips, representing the elimination of these trips from the roadway network. Thus, with the addition of the traffic projected to be generated by the proposed project to the roadway network and the elimination of the trips associated with the existing building (negative trips), the total traffic assignment represents the net site generated traffic. Figure 10 shows the assignment of net project trips at each study intersection.

Background Plus Project Traffic Volumes

Net project trips associated with the proposed project, as presented in the above project trip assignment, were added to the background traffic volumes to obtain background plus project traffic volumes. Background plus project conditions traffic volumes for the proposed project are shown on Figure 11. Traffic volumes for all components of traffic are tabulated in Appendix B.

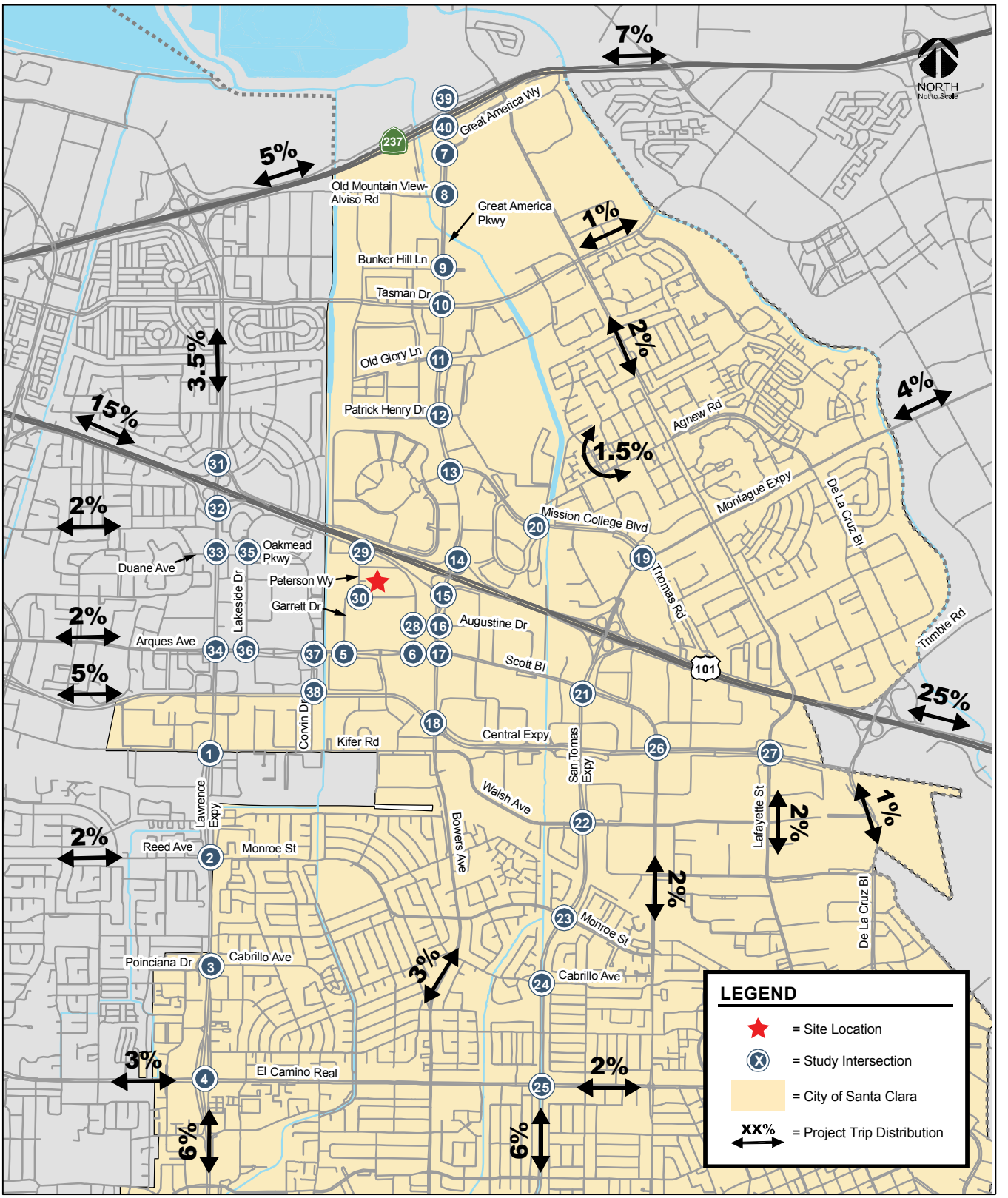


Figure 9
Project Trip Distribution

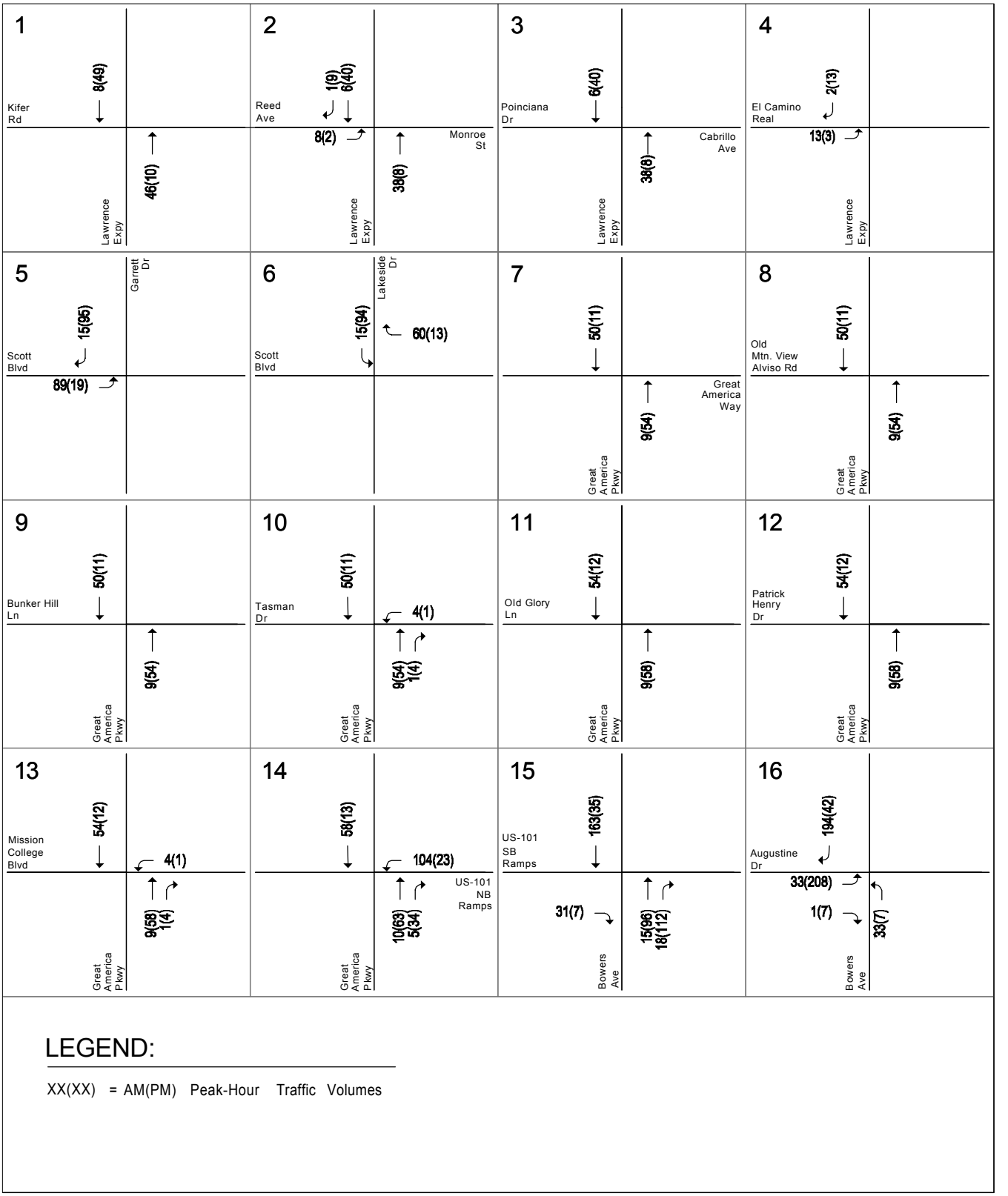
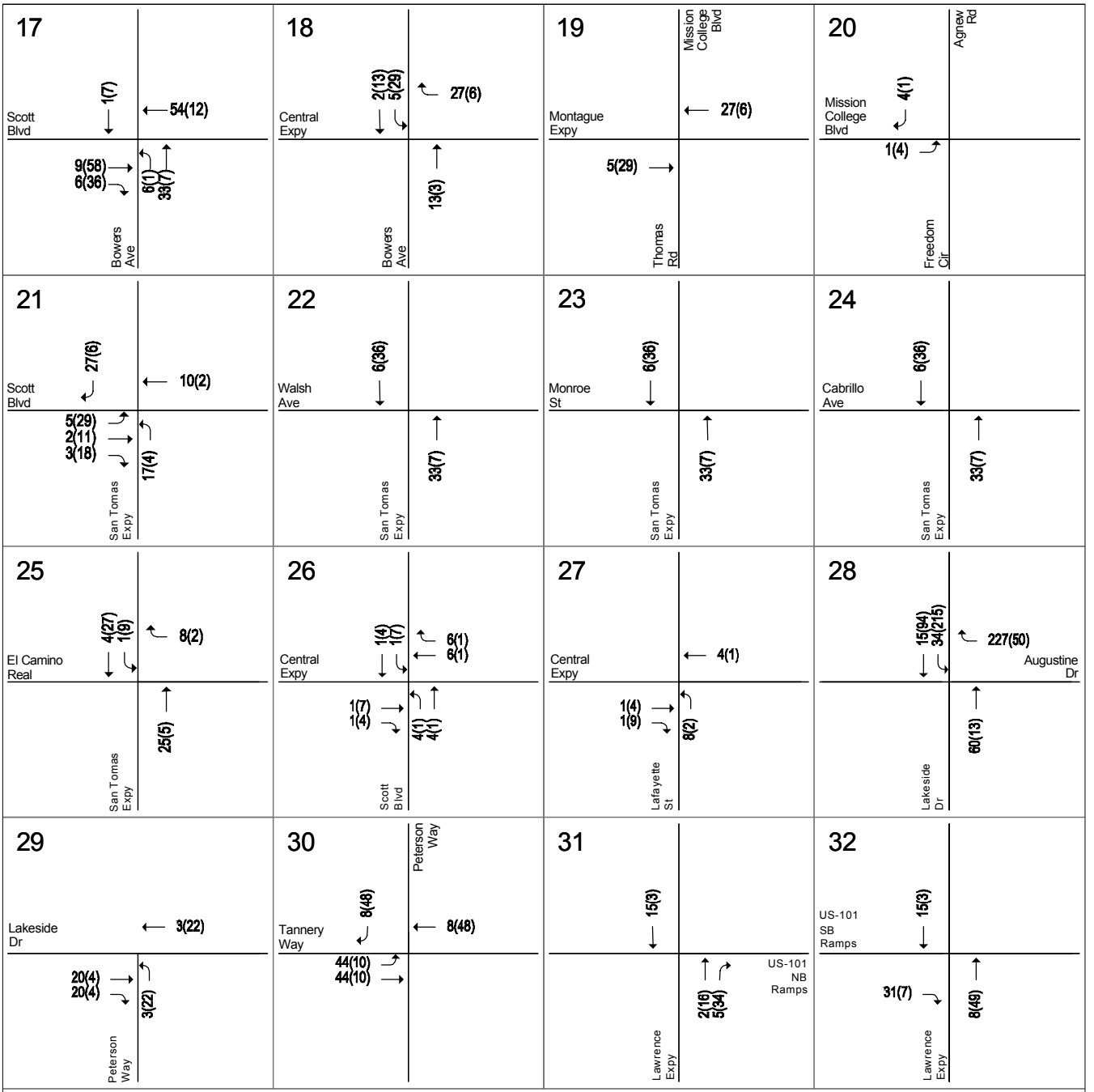


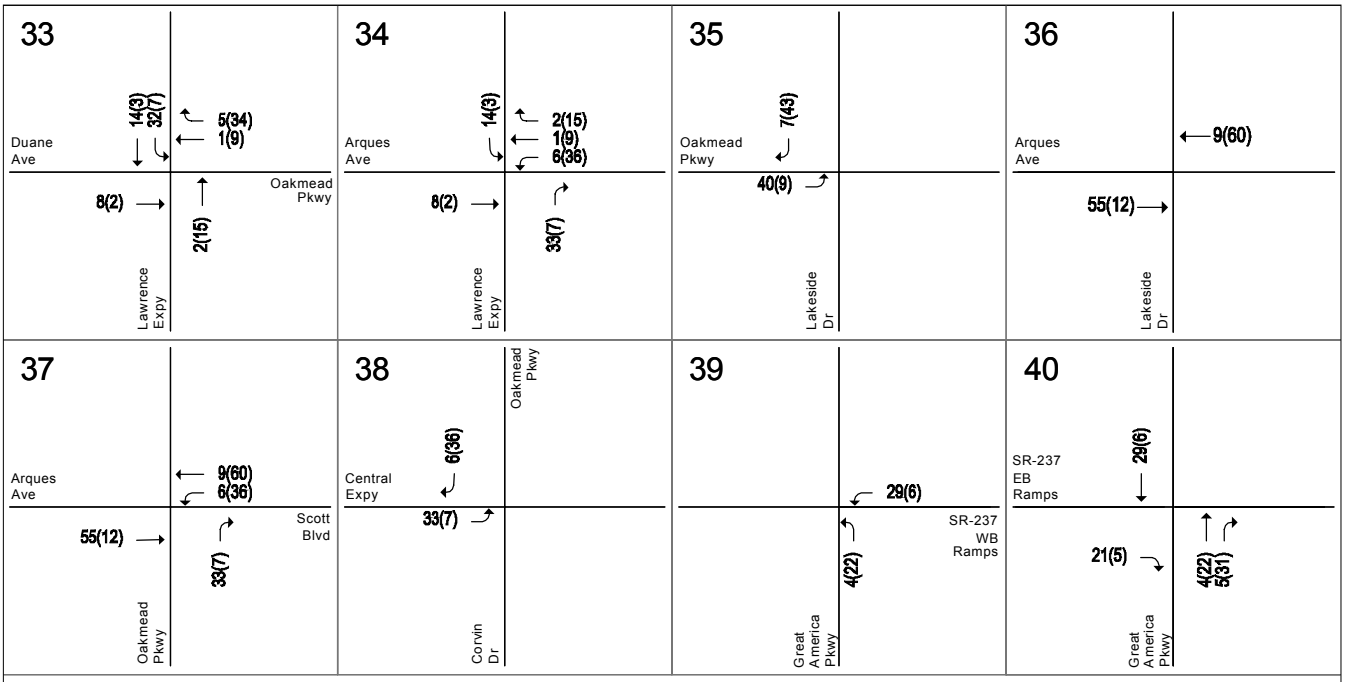
Figure 10
Net Project Trip Assignment



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 10 (Continued)
Net Project Trip Assignment



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 10 (Continued)
Net Project Trip Assignment

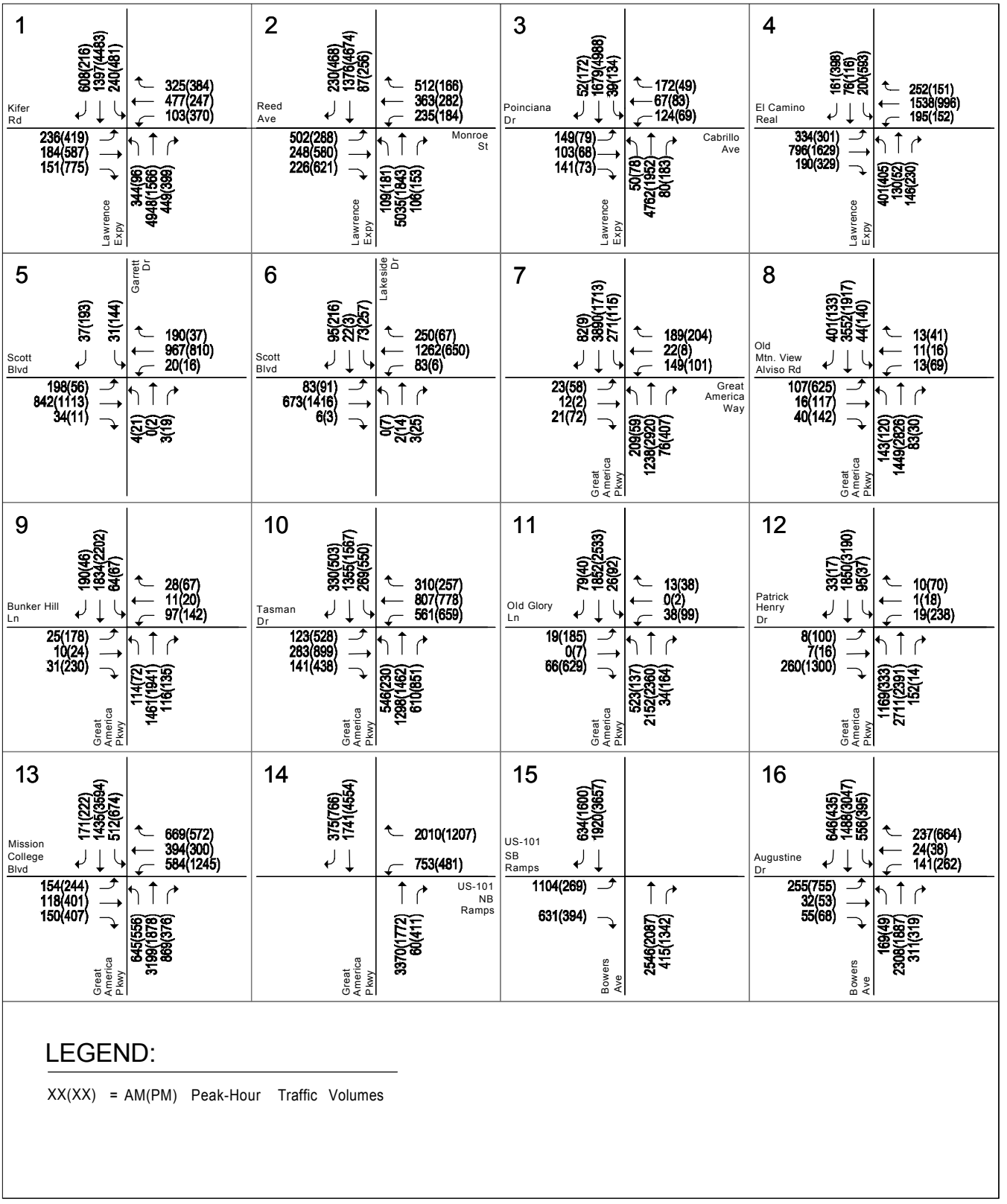
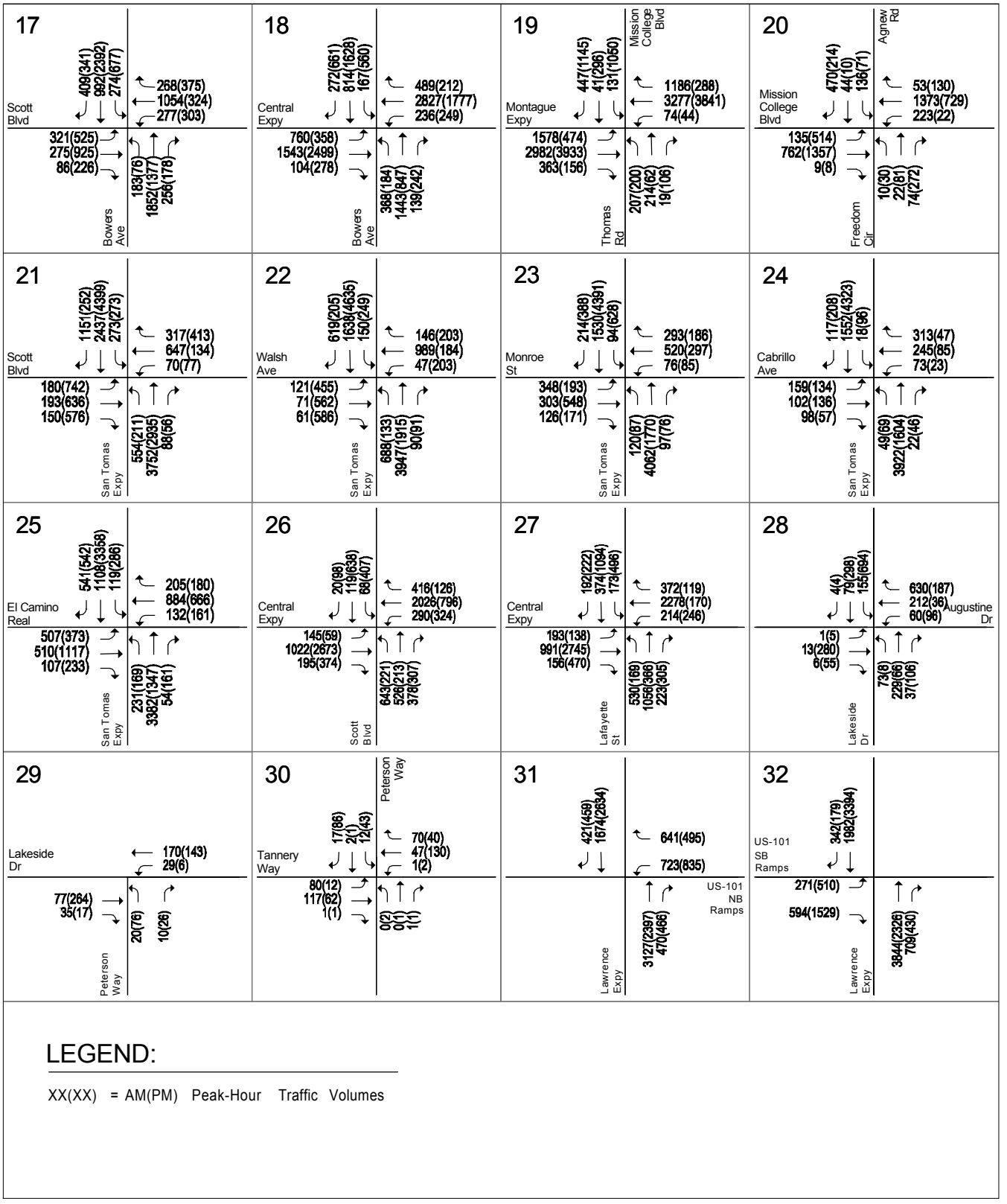


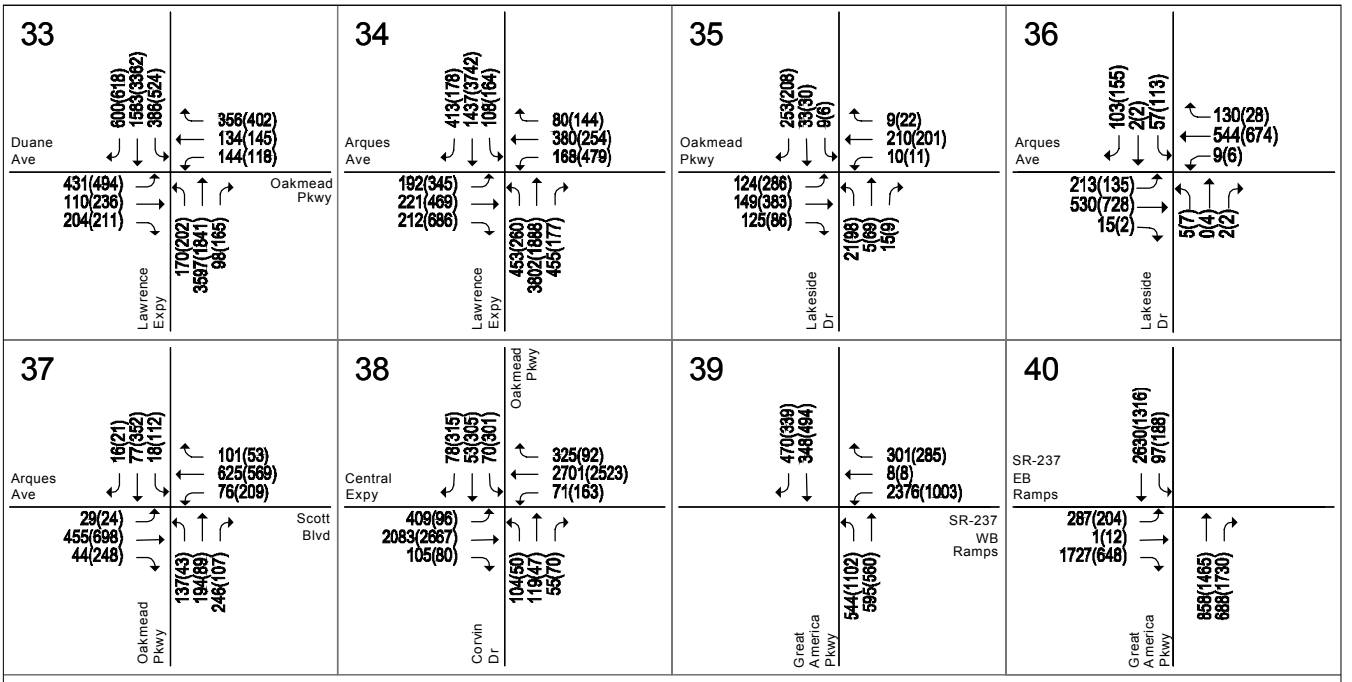
Figure 11
Background Plus Project Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 11 (Continued)
Background Plus Project Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 11 (Continued)
Background Plus Project Traffic Volumes

Background Plus Project Intersection Levels of Service

The results of the intersection level of service analysis under background plus project conditions are summarized in Table 9. The results show that, measured against the applicable municipal and CMP level of service standards, the following 18 study intersections are projected to operate at an unacceptable level of service (LOS E or worse for locally controlled intersections and LOS F for CMP and expressway intersections) under background plus project conditions (CMP intersections are denoted with an asterisk*):

City of Santa Clara Intersections

1. Lawrence Expressway and Kifer Road (LOS F – AM and PM)
2. Lawrence Expressway and Monroe Street/Reed Avenue* (LOS F – AM and PM)
3. Lawrence Expressway and Cabrillo Avenue (LOS F – AM peak-hour)
7. Great America Parkway and Great America Way (LOS F – AM peak-hour) (**Impact**: AM peak-hour)
8. Great America Parkway and Old Mountain View-Alviso Road (LOS E – AM peak-hour) (**Impact**: AM peak-hour)
13. Great America Parkway and Mission College Boulevard* (LOS F – PM peak-hour)
16. Bowers Avenue and Augustine Drive (LOS E – PM peak-hour) (**Impact**: PM peak-hour)
17. Bowers Avenue and Scott Boulevard* (LOS F – AM and PM) (**Impact**: AM and PM peak hours)
18. Bowers Avenue and Central Expressway* (LOS F – AM and PM)
19. Mission College Boulevard/Thomas Road and Montague Expwy* (LOS F – AM and PM)
21. San Tomas Expressway and Scott Boulevard* (LOS F – PM peak-hour) (**Impact**: PM peak-hour)
22. San Tomas Expressway and Walsh Avenue (LOS E – AM, LOS F – PM)
23. San Tomas Expressway and Monroe Street* (LOS F – PM peak-hour) (**Impact**: PM peak-hour)
25. San Tomas Expressway and El Camino Real* (LOS F – AM and PM)
26. Scott Boulevard and Central Expressway* (LOS F – PM peak-hour)
27. Lafayette Street and Central Expressway* (LOS F – PM peak-hour)
28. Lakeside Drive and Augustine Drive (LOS F – AM and PM) (**Impact**: AM and PM peak hours)

City of Sunnyvale Intersections

34. Lawrence Expressway and Arques Avenue* (LOS F – PM peak-hour)
38. Oakmead Parkway/Corvin Drive and Central Expressway* (LOS F – AM and PM) (**Impact**: AM and PM peak hours)

Based on the applicable level of service standards and significance criteria, eight of the above intersections would be significantly impacted by the proposed project under background plus project conditions. The impacts and proposed improvements to mitigate the impacts are described below.

The remaining signalized study intersection would continue to operate at acceptable levels of service during both peak hours analyzed under background plus project conditions. The level of service calculation sheets are included in Appendix C.

Table 9
Background Plus Project Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Background Avg. Delay	Background LOS	Background Plus Project Avg. Delay	Background Plus Project LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Lawrence Expressway and Kifer Road	E	AM	03/07/18	**99.9**	**F**	**102.2**	**F**	**+3.5**	**0.008**
			PM	03/07/18	**128.4**	**F**	**130.6**	**F**	**+3.7**	**0.007**
2	Lawrence Expressway and Monroe Street/Reed Avenue*	E	AM	03/07/18	**134.9**	**F**	**137.5**	**F**	**+3.6**	**0.009**
			PM	10/05/16	**110.6**	**F**	**112.3**	**F**	**+2.8**	**0.006**
3	Lawrence Expressway and Cabrillo Avenue	E	AM	03/07/18	**80.6**	**F**	**83.1**	**F**	**+3.5**	**0.006**
			PM	03/07/18	66.6	E	68.8	E	+3.3	0.006
4	Lawrence Expressway and El Camino Real*	E	AM	03/07/18	36.2	D+	36.3	D+	+0.3	0.005
			PM	11/10/16	33.5	C-	33.5	C-	0.0	0.000
5	Garrett Drive and Scott Boulevard	D	AM	08/30/16	7.8	A	9.8	A	+3.3	0.064
			PM	08/30/16	9.5	A	9.9	A	0.0	0.000
6	Lakeside Drive and Scott Boulevard	D	AM	08/30/16	11.2	B+	11.5	B+	+0.4	0.026
			PM	08/30/16	10.5	B+	11.9	B+	+2.3	0.035
7	Great America Parkway and Great America Way	D	AM	01/26/16	**96.1**	**F**	**99.8**	**F**	**+5.1**	**0.011**
			PM	01/26/16	33.1	C-	36.7	D+	+5.6	0.012
8	Great America Parkway and Old Mountain View-Alviso Road	D	AM	01/26/16	**59.3**	**E+**	**63.1**	**E**	**+5.3**	**0.011**
			PM	01/26/16	47.2	D	48.5	D	+2.1	0.011
9	Great America Parkway and Bunker Hill Lane	D	AM	01/26/16	11.4	B+	11.3	B+	-0.1	0.011
			PM	01/26/16	23.3	C	23.3	C	0.0	0.002
10	Great America Parkway and Tasman Drive*	E	AM	03/07/18	46.1	D	46.1	D	+0.1	0.010
			PM	11/17/16	52.9	D-	53.3	D-	+0.8	0.003
11	Great America Parkway and Old Glory Lane	D	AM	01/26/16	17.0	B	17.1	B	+0.2	0.012
			PM	01/26/16	41.1	D	41.3	D	+0.2	0.002
12	Great America Parkway and Patrick Henry Drive	D	AM	01/26/16	33.6	C-	34.5	C-	+1.6	0.011
			PM	01/26/16	30.1	C	30.0	C	+0.2	0.002
13	Great America Parkway and Mission College Boulevard*	E	AM	03/07/18	48.1	D	48.1	D	+0.1	0.001
			PM	12/06/16	**81.0**	**F**	**81.3**	**F**	**+0.7**	**0.002**
14	Great America Parkway and US 101 Northbound Ramps*	E	AM	01/26/16	12.9	B	15.5	B	+3.3	0.038
			PM	11/17/16	22.6	C+	24.8	C	+3.1	0.010
15	Bowers Avenue and US 101 Southbound Ramps*	E	AM	01/26/16	19.0	B-	19.2	B-	+0.1	0.003
			PM	11/17/16	6.5	A	6.5	A	+0.1	0.006
16	Bowers Avenue and Augustine Drive	D	AM	08/30/16	39.9	D	39.7	D	0.0	0.001
			PM	08/30/16	**57.5**	**E+**	**72.8**	**E**	**+22.8**	**0.057**
17	Bowers Avenue and Scott Boulevard*	E	AM	11/07/17	**91.8**	**F**	**100.1**	**F**	**+12.4**	**0.023**
			PM	11/16/16	**80.4**	**F**	**84.9**	**F**	**+11.6**	**0.030**
18	Bowers Avenue and Central Expressway*	E	AM	11/07/17	**84.4**	**F**	**84.9**	**F**	+0.9	0.004
			PM	10/05/16	**102.6**	**F**	**104.9**	**F**	+2.0	0.002
19	Mission College Boulevard/Thomas Road and Montague Expressway*	E	AM	11/07/17	**176.6**	**F**	**177.8**	**F**	0.0	0.000
			PM	10/04/16	**144.7**	**F**	**153.3**	**F**	+0.5	0.001
20	Agnew Road/Freedom Circle and Mission College Boulevard	D	AM	11/29/16	30.8	C	30.9	C	+0.2	0.003
			PM	11/29/16	35.0	C-	35.1	D+	+0.2	0.003
21	San Tomas Expressway and Scott Boulevard*	E	AM	11/07/17	43.8	D	46.2	D	+8.0	0.025
			PM	10/04/16	**90.1**	**F**	**93.5**	**F**	**+4.9**	**0.012**
22	San Tomas Expressway and Walsh Avenue	E	AM	11/07/17	**79.0**	**E-**	**79.7**	**E-**	-0.2	0.001
			PM	03/07/18	**129.1**	**F**	**131.2**	**F**	+3.1	0.006
23	San Tomas Expressway and Monroe Street*	E	AM	11/07/17	56.5	E+	57.9	E+	+2.2	0.005
			PM	10/04/16	78.1	E-	**80.1**	**F**	**+3.5**	**0.006**
24	San Tomas Expressway and Cabrillo Avenue	E	AM	11/07/17	34.0	C-	34.4	C-	-0.1	0.001
			PM	03/07/18	40.9	D	41.4	D	0.0	0.001
25	San Tomas Expressway and El Camino Real*	E	AM	11/07/17	**98.5**	**F**	**99.8**	**F**	+2.1	0.005
			PM	10/04/16	**121.9**	**F**	**123.8**	**F**	+3.3	0.005
26	Scott Boulevard and Central Expressway*	E	AM	11/07/17	44.4	D	44.6	D	+0.1	0.003
			PM	10/04/16	**85.4**	**F**	**86.4**	**F**	+1.0	0.003
27	Lafayette Street and Central Expressway*	E	AM	11/07/17	74.4	E	75.0	E	+1.7	0.004
			PM	10/04/16	**111.5**	**F**	**111.5**	**F**	+0.2	0.001
28	Lakeside Drive and Augustine Drive	D	AM	03/07/18	27.8	C	**85.4**	**F**	**+69.9**	**0.264**
			PM	03/07/18	36.5	D+	**81.3**	**F**	**+67.4**	**0.182**

Table 9 (Continued)
Background Plus Project Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Background Avg. Delay	Background LOS	Background Plus Project Avg. Delay	Background Plus Project LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
31	Lawrence Expressway and US 101 Northbound Ramps	E	AM	03/07/18	10.5	B+	10.5	B+	0.0	0.000
			PM	03/07/18	12.6	B	12.6	B	0.0	0.000
32	Lawrence Expressway and US 101 Southbound Ramps	E	AM	08/30/16	13.8	B	15.5	B	+3.2	0.008
			PM	08/30/16	27.6	C	27.7	C	+0.3	0.002
33	Lawrence Expressway and Oakmead Parkway	E	AM	03/07/18	56.3	E+	58.0	E+	+3.0	0.013
			PM	03/07/18	53.7	D-	54.1	D-	+0.1	0.001
34	Lawrence Expressway and Arques Avenue*	E	AM	08/30/16	48.9	D	49.1	D	0.0	0.000
			PM	10/04/16	**108.1**	**F**	**108.3**	**F**	**+0.5**	**0.012**
35	Lakeside Drive and Oakmead Parkway	D	AM	03/07/18	20.3	C+	19.9	B-	+1.2	0.026
			PM	03/07/18	20.2	C+	19.8	B-	-0.1	0.006
36	Lakeside Drive and Arques Avenue	D	AM	08/30/16	22.7	C+	22.2	C+	-0.1	0.003
			PM	08/30/16	17.9	B	17.9	B	0.0	0.004
37	Oakmead Parkway and Arques Avenue/Scott Boulevard	D	AM	08/30/16	21.7	C+	21.8	C+	-0.1	0.003
			PM	08/30/16	26.3	C	26.5	C	+0.9	0.027
38	Oakmead Parkway/Corvin Drive and Central Expressway*	E	AM	11/07/17	78.6	E-	**84.6**	**F**	**+10.7**	**0.020**
			PM	10/04/16	79.9	E-	**80.3**	**F**	**0.0**	**0.000**
39	Great America Parkway and SR 237 Westbound Ramps*	D	AM	10/12/16	48.3	D	50.3	D	+2.6	0.008
			PM	11/02/16	27.9	C	28.6	C	+0.8	0.009
40	Great America Parkway and SR 237 Eastbound Ramps*	D	AM	10/12/16	12.7	B	12.7	B	0.0	0.006
			PM	11/02/16	12.6	B	12.8	B	+0.2	0.010

Notes:
* Denotes CMP Intersections
Entries denoted in **bold** indicate conditions that exceed the applicable level of service standard.
Bold and boxed indicate significant project impact.

Unsignalized Intersection Analysis (Traffic Signal Warrants)

The unsignalized study intersections of Peterson Way/Lakeside Drive and Peterson Way/Tannery Way were analyzed for operational purposes. Unsignalized intersections are analyzed on the basis of the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the California *Manual on Uniform Traffic Control Devices* (MUTCD), 2014 Edition. This method makes no evaluation of intersection level of service, but simply provides an indication whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal.

The results of the peak-hour traffic signal warrant checks indicate that both of the unsignalized study intersections are projected to have traffic volumes that fall below the thresholds that warrant signalization under background plus project conditions. The peak-hour signal warrant sheets are contained in Appendix E.

Freeway Segment Analysis

Traffic volumes on the study freeway segments with the proposed project were estimated by adding project trips to the existing volumes obtained from the 2016 CMP Annual Monitoring Report.

The results of the CMP freeway segment analysis are summarized in Table 10. The results show that the mixed-flow lanes on 26 of the 30 directional freeway segments analyzed would operate at an unacceptable LOS F during one of the peak hours under project conditions. In addition, the HOV lanes on 25 of the study segments also are projected to operate at LOS F conditions under project conditions.

Table 10
Existing Plus Project Freeway Segment Level of Service Analysis

#	Freeway	Segment	Direction	Peak Hour	Existing Plus Project: Mixed-Flow Lane Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	HOV Lane Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	Project Trips: Total Volume	Mixed-Flow Lane Volume[2]	Mixed-Flow Lane % of Capacity	HOV Lane Volume[2]	HOV Lane % of Capacity
1	US 101	from I-880 to Old Bayshore Highway	NB	AM	8	3	6,900	3,050	3,125	**130**	**F**	15	1	1,650	1,470	1,499	**100**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	67	3	6,900	3,200	3,219	16	B	70	1	1,650	840	844	12	B	23	19	0.28	4	0.24
2	US 101	from Old Bayshore Highway to North First Street	NB	AM	9	3	6,900	3,300	3,375	**125**	**F**	12	1	1,650	1,300	1,329	**111**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	67	3	6,900	3,400	3,419	17	B	70	1	1,650	560	564	8	A	23	19	0.28	4	0.24
3	US 101	from North First Street to Guadalupe Parkway (SR 87)	NB	AM	12	3	6,900	3,890	3,965	**110**	**F**	11	1	1,650	1,210	1,239	**113**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	67	3	6,900	2,800	2,819	14	B	70	1	1,650	630	634	9	A	23	19	0.28	4	0.24
4	US 101	from Guadalupe Parkway (SR 87) to De La Cruz Boulevard	NB	AM	8	3	6,900	3,050	3,125	**130**	**F**	12	1	1,650	1,290	1,319	**110**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	66	3	6,900	3,770	3,789	19	C	70	1	1,650	630	634	9	A	23	19	0.28	4	0.24
5	US 101	from De La Cruz Boulevard to San Tomas Expressway/Montague Expressway	NB	AM	23	3	6,900	5,250	5,325	**77**	**F**	26	1	1,650	1,850	1,879	**72**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	66	3	6,900	4,760	4,779	24	C	70	1	1,650	770	774	11	A	23	19	0.28	4	0.24
6	US 101	from San Tomas Expressway/Montague Expressway to Bowers Avenue/Great America Parkway	NB	AM	15	3	6,900	4,370	4,445	**99**	**F**	19	1	1,650	1,640	1,669	**88**	**F**	104	**75**	**1.09**	**29**	**1.76**
			NB	PM	66	3	6,900	5,510	5,529	28	D	70	1	1,650	770	774	11	A	23	19	0.28	4	0.24
7	US 101	from Bowers Avenue/Great America Parkway to Lawrence Expressway	NB	AM	16	3	6,900	4,470	4,474	**93**	**F**	21	1	1,650	1,710	1,711	**81**	**F**	5	4	0.06	1	0.06
			NB	PM	65	3	6,900	5,660	5,688	29	D	70	1	1,650	1,120	1,126	16	B	34	28	0.41	6	0.36
8	US 101	from Lawrence Expressway to North Fair Oaks Avenue	NB	AM	19	3	6,900	4,790	4,798	**84**	**F**	25	1	1,650	1,830	1,833	**73**	**F**	11	8	0.12	3	0.18
			NB	PM	65	3	6,900	5,660	5,718	29	D	70	1	1,650	840	849	12	B	67	58	0.84	9	0.55
9	US 101	from North Fair Oaks Avenue to North Mathilda Avenue	NB	AM	33	3	6,900	5,940	5,948	**60**	**F**	38	1	1,650	2,060	2,063	54	E	11	8	0.12	3	0.18
			NB	PM	66	3	6,900	4,760	4,818	24	C	70	1	1,650	770	779	11	A	67	58	0.84	9	0.55
10	US 101	from North Mathilda Avenue to SR 237	NB	AM	43	3	6,900	6,330	6,338	49	E	26	1	1,650	1,850	1,853	**71**	**F**	11	8	0.12	3	0.18
			NB	PM	66	3	6,900	4,760	4,812	24	C	70	1	1,650	1,400	1,415	20	C	67	52	0.75	15	0.91
11	SR 237	from Lawrence Expressway to Great America Parkway	EB	AM	64	2	4,400	4,100	4,116	32	D	67	1	1,650	1,210	1,215	18	B	21	16	0.36	5	0.30
			EB	PM	14	2	4,400	2,830	2,833	**101**	**F**	30	1	1,650	2,070	2,072	**69**	**F**	5	3	0.07	2	0.12
12	SR 237	from Great America Parkway to North First Street	EB	AM	64	2	4,400	4,100	4,104	32	D	66	1	1,650	1,390	1,391	21	C	5	4	0.09	1	0.06
			EB	PM	12	2	4,400	2,550	2,569	**107**	**F**	30	1	1,650	1,920	1,932	**64**	**F**	31	19	0.43	12	0.73
13	SR 237	from North First Street to Zanker Road	EB	AM	48	2	4,400	4,320	4,324	45	D	67	1	1,650	1,010	1,011	15	B	5	4	0.09	1	0.06
			EB	PM	25	2	4,400	3,600	3,619	**72**	**F**	50	1	1,650	2,350	2,362	47	E	31	19	0.43	12	0.73
14	SR 237	from Zanker Road to McCarthy Boulevard	EB	AM	66	2	4,400	3,670	3,674	28	D	67	1	1,650	1,010	1,011	15	B	5	4	0.09	1	0.06
			EB	PM	52	2	4,400	4,370	4,389	42	D	70	1	1,650	1,960	1,972	28	D	31	19	0.43	12	0.73
15	SR 237	from McCarthy Boulevard to I-880	EB	AM	66	2	4,400	2,860	2,864	22	C	67	1	1,650	470	471	7	A	5	4	0.09	1	0.06
			EB	PM	66	2	4,400	2,720	2,739	21	C	60	1	1,650	2,280	2,292	38	D	31	19	0.43	12	0.73
16	US 101	from SR 237 to North Mathilda Avenue	SB	AM	66	3	6,900	4,560	4,575	23	C	55	1	1,650	2,200	2,248	41	D	63	15	0.22	48	2.91
			SB	PM	18	3	6,900	4,700	4,705	**87**	**F**	40	1	1,650	2,400	2,409	**60**	**F**	14	5	0.07	9	0.55
17	US 101	from North Mathilda Avenue to North Fair Oaks Avenue	SB	AM	66	3	6,900	4,760	4,775	24	C	67	1	1,650	1,210	1,258	19	C	63	15	0.22	48	2.91
			SB	PM	25	3	6,900	5,400	5,405	**72**	**F**	30	1	1,650	2,040	2,049	**68**	**F**	14	5	0.07	9	0.55
18	US 101	from North Fair Oaks Avenue to Lawrence Expressway	SB	AM	66	3	6,900	5,510	5,525	28	D	67	1	1,650	1,140	1,188	18	B	63	15	0.22	48	2.91
			SB	PM	16	3	6,900	4,420	4,425	**92**	**F**	20	1	1,650	2,120	2,129	**106**	**F**	14	5	0.07	9	0.55
19	US 101	from Lawrence Expressway to Bowers Avenue/Great America Parkway	SB	AM	62	3	6,900	6,510	6,537	35	D	67	1	1,650	1,010	1,014	15	B	31	27	0.39	4	0.24
			SB	PM	11	3	6,900	3,670	3,674	**111**	**F**	20	1	1,650	2,040	2,043	**102**	**F**	7	4	0.06	3	0.18
20	US 101	from Bowers Avenue/Great America Parkway to San Tomas Expressway/Montague Expressway	SB	AM	66	3	6,900	4,160	4,176	21	C	67	1	1,650	940	942	14	B	18	16	0.23	2	0.12
			SB	PM	12	3	6,900	3,890	3,962	**110**	**F**	20	1	1,650	2,180	2,220	**111**	**F**	112	**72**	**1.04**	**40**	**2.42**
21	US 101	from San Tomas Expressway/Montague Expressway to De La Cruz Boulevard	SB	AM	66	3	6,900	4,950	4,966	25	C	67	1	1,650	740	742	11	A	18	16	0.23	2	0.12
			SB	PM	11	3	6,900	3,670	3,742	**113**	**F**	30	1	1,650	2,130	2,170	**72**	**F**	112	**72**	**1.04**	40	2.42
22	US 101	from De La Cruz Boulevard to Guadalupe Parkway (SR 87)	SB	AM	66	3	6,900	4,950	4,966	25	C	67	1	1,650	410	412	6	A	18	16	0.23	2	0.12
			SB	PM	40	3	6,900	6,240	6,312	53	E	70	1	1,650	2,520	2,560	37	D	112	72	1.04	40	2.42
23	US 101	from Guadalupe Parkway (SR 87) to North First Street	SB	AM	67	3	6,900	3,200	3,216	16	B	67	1	1,650	210	212	3	A	18	16	0.23	2	0.12
			SB	PM	24	3	6,900	5,400	5,472	**76**	**F**	30	1	1,650	2,190	2,230	**74**	**F**	112	**72**	**1.04**	40	2.42
24	US 101	from North First Street to Old Bayshore Highway	SB	AM	67	3	6,900	2,600	2,616	13	B	67	1	1,650	140	142	2	A	18	16	0.23	2	0.12
			SB	PM	6	3	6,900	2,880	2,952	**164**	**F**	20	1	1,650	2,160	2,200	**110**	**F**	112	**72**	**1.04**	40	2.42
25	US 101	from Old Bayshore Highway to I-880	SB	AM	67	3	6,900	3,600	3,616	18	B	67	1	1,650	410	412	6	A	18	16	0.23	2	0.12
			SB	PM	6	3	6,900	2,450	2,522	**140**	**F**	20	1	1,650	1,800	1,840	**92**	**F**	112	**72**	**1.04**	40	2.42

Table 10 (Continued)
Existing Plus Project Freeway Segment Level of Service Analysis

#	Freeway	Segment	Direction	Peak Hour	Existing Plus Project															Project Trips				
					Mixed-Flow Lane							HOV Lane								Total	Mixed-Flow Lane		HOV Lane	
					Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	Avg. Speed[1]	# of Lanes[1]	Capacity (vph)	Ex. Volume/a/	Volume	Density	LOS	Volume	Volume[2]	% of Capacity	Volume[2]	% of Capacity
26	SR 237	from I-880 to McCarthy Boulevard	WB	AM	11	2	4,400	2,490	2,508	**114**	**F**	29	1	1,650	1,890	1,901	**66**	**F**	29	18	0.41	11	0.67
			WB	PM	66	2	4,400	2,640	2,645	20	C	70	1	1,650	630	631	9	A	6	5	0.11	1	0.06
27	SR 237	from McCarthy Boulevard to Zanker Road	WB	AM	10	2	4,400	2,760	2,778	**139**	**F**	24	1	1,650	1,780	1,791	**75**	**F**	29	18	0.41	11	0.67
			WB	PM	64	2	4,400	4,920	4,925	38	D	70	1	1,650	1,190	1,191	17	B	6	5	0.11	1	0.06
28	SR 237	from Zanker Road to North First Street	WB	AM	15	2	4,400	2,940	2,958	**99**	**F**	26	1	1,650	1,820	1,831	**70**	**F**	29	18	0.41	11	0.67
			WB	PM	48	2	4,400	4,320	4,325	45	D	70	1	1,650	770	771	11	A	6	5	0.11	1	0.06
29	SR 237	from North First Street to Great America Parkway	WB	AM	16	2	4,400	2,950	2,968	**93**	**F**	19	1	1,650	1,600	1,611	**85**	**F**	29	18	0.41	11	0.67
			WB	PM	58	2	4,400	4,410	4,415	38	D	70	1	1,650	980	981	14	B	6	5	0.11	1	0.06
30	SR 237	from Great America Parkway to Lawrence Expressway	WB	AM	13	2	4,400	2,680	2,682	**103**	**F**	20	1	1,650	1,640	1,642	**82**	**F**	4	2	0.05	2	0.12
			WB	PM	66	2	4,400	3,540	3,557	27	D	70	1	1,650	1,050	1,055	15	B	22	17	0.39	5	0.30

[1] Source: Santa Clara Valley Transportation Authority Congestion Management Program Monitoring Study, 2016.
[2] The breakdown of project trips between the mixed-flow and HOV lanes was estimated based on the average percentage of traffic currently utilizing the HOV lanes within the study freeway segments.
Bold indicates unacceptable LOS.
Boxed indicates significant impact.

The proposed project is projected to add traffic volumes representing 1% or more of the freeway capacity to the mixed-flow lanes on 11 directional freeway segments and to the HOV lanes on 7 directional freeway segment that currently operate at LOS F. Based on CMP freeway impact criteria, the following directional freeway segment (mixed-flow and/or HOV lanes) would be impacted by the proposed project.

1. Northbound US 101, from I-880 to Old Bayshore Highway
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
2. Northbound US 101, from Old Bayshore Highway to North First Street
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
3. Northbound US 101, from North First Street to Guadalupe Parkway (SR 87)
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
4. Northbound US 101, from Guadalupe Parkway (SR 87) to De La Cruz Boulevard
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
5. Northbound US 101, from De La Cruz Boulevard to San Tomas/Montague Expressway
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
6. Northbound US 101, from San Tomas/Montague Expwy to Bowers Ave/Great America Pkwy
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
20. Southbound US 101, from Bowers Ave/Great America Pkwy to San Tomas/Montague Expwy
    (**Impact:** PM peak-hour – Mixed-flow and HOV lanes)
21. Southbound US 101, from San Tomas/Montague Expressway to De La Cruz Boulevard
    (**Impact:** PM peak-hour – Mixed-flow lanes)
23. Southbound US 101, from Guadalupe Parkway (SR 87) to North First Street
    (**Impact:** PM peak-hour – Mixed-flow lanes)
24. Southbound US 101, from North First Street to Old Bayshore Highway
    (**Impact:** PM peak-hour – Mixed-flow lanes)
25. Southbound US 101, from Old Bayshore Highway to I-880
    (**Impact:** PM peak-hour – Mixed-flow lanes)

Full mitigation of significant project impacts on freeway segments would require roadway freeway widening to construct additional through lanes, thereby increasing freeway capacity. The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along US 101, between Whipple Avenue in San Mateo County and Cochrane Road in Morgan Hill (VTP ID: H2), which includes the impacted freeway segments. The express lane projects on US 101 consist of the conversion of approximately 34 miles of existing High Occupancy Vehicle (HOV or carpool) lanes to express lanes and adding a second express lane for a total of two express lanes in each direction. However, converting the HOV lanes to express lanes would not mitigate the project impacts. Therefore, the significant impacts on the directional freeway segments identified above must be considered significant and unavoidable.

Both VTA and Caltrans have encouraged local agencies to collect "voluntary contributions" to be used toward improvement of the regional freeway system. Therefore, the project may be required to make a fair-share contribution toward the cost of the US 101 express lane project. The amount of the contribution, if required, would be negotiated with the City of Santa Clara.

Project Impacts and Mitigation Measures

This section discusses the project impacts identified under background plus project conditions. Included are descriptions of project impacts to intersections and proposed mitigation measures.

The mitigation measures listed below were developed based on information from the City Place Santa Clara Project Environmental Impact Report (EIR), dated April 2016.

(7) Great America Parkway and Great America Way (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an unacceptable LOS F during the AM peak hour under background conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 5.1 seconds and the volume-to-capacity ratio (V/C) to increase by 0.011 during the AM peak-hour. Based on City of Santa Clara level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). Improvements to mitigate project impacts at this intersection, which include the addition of a second westbound right-turn lane and a second southbound left-turn lane, have been identified by City Place (and are included under background conditions). However, although the planned improvements are projected to improve operating conditions at the intersection, the intersection is projected to continue to operate deficiently under background conditions. The City Place EIR has identified the above improvements as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

Other possible improvements to mitigate the project impact at this location include the addition of a second northbound left-turn lane. This improvement would require the partial removal of the center median on Great America Parkway (south leg of the intersection), widening of Great America Parkway, and implementation of a second receiving lane on the west leg of the intersection (private driveway). With implementation of this improvement, the intersection level of service is projected to improve to LOS E during the AM peak-hour, reducing the project impact to *less than significant*; however, the intersection would continue to operate unacceptably during the AM peak-hour. However, the widening of Great America Parkway and the west leg of the intersection is not feasible. Therefore, this improvement is not feasible due to right-of-way constraints.

The necessary improvement to improve the intersection's operating conditions to acceptable levels consists of the addition of a fourth southbound through lane. This improvement, however, is not feasible due to right-of-way constraints. Therefore, this project impact would be considered ***significant and unavoidable***.

(8) Great America Parkway and Old Mountain View-Alviso Road (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an unacceptable LOS E during the AM peak hour under background conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 5.3 seconds and the volume-to-capacity ratio (V/C) to increase by 0.011 during the AM peak-hour. Based on City of Santa Clara level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). Improvements to mitigate project impacts at this intersection, which include the addition of a second eastbound left-turn lane, have been identified by City Place (and are included under background conditions). However, although the planned improvements are projected to improve operating conditions at the intersection, the intersection is projected to continue to operate deficiently under background conditions. The City Place EIR has identified the above improvements as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate southbound right-turn lane. The southbound approach at this location currently consists of

one left-turn lane, three through lanes, and an 8-foot wide bike lane/right-turn lane. Implementation of the separate southbound right-turn lane improvement would require the widening of the west side of Great America Parkway (north of Old Mountain View/Alviso Road) by approximately 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane) for a distance of approximately 150 feet. The widening of the west side of Great America Parkway would require partial removal of landscape and the relocation of two traffic signal/utilities cabinets, a light pole, and a traffic signal pole. With implementation of the above improvement, the intersection level of service is projected to improve to an acceptable LOS C during the AM peak-hour, reducing the project impact to ***less than significant***.

(16) Bowers Avenue and Augustine Drive (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an unacceptable LOS E during the PM peak hour under background conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 22.8 seconds and the volume-to-capacity ratio (V/C) to increase by 0.057 during the PM peak-hour. Based on City of Santa Clara level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). However, the City Place EIR identified no feasible mitigations due to right-of-way restrictions and has determined their impact at this location to be significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a fourth southbound through lane. This improvement, however, would require the widening of Bowers Avenue which is not be feasible due to right-of-way constraints. Therefore, the project impact to this intersection is considered ***significant and unavoidable***.

(17) Bowers Avenue and Scott Boulevard (CMP Intersection)

Impact: This City of Santa Clara and CMP intersection would operate at an unacceptable LOS F during the AM and PM peak hours under background conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 12.4 and 11.6 seconds during the AM and PM peak hours, respectively, and the volume-to-capacity ratio (V/C) to increase by 0.023 and 0.030 during the AM and PM peak hours, respectively. Based on CMP level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second southbound left-turn lane at this intersection as mitigation to their project impact.

With implementation of a second southbound left-turn lane, the intersection is projected to operate at acceptable LOS E during the PM peak-hour under background plus project conditions, however, the intersection would continue to operate at an unacceptable LOS F during the AM peak-hour and the project impact would continue to be significant. Implementation of this improvement would require reducing the outside lane width (which includes a bike lane) to 16 feet, reducing the width of the inner two southbound through lanes from 12 feet to 11 feet, and partial removal of the raised center median to provide a second 10-12-foot left-turn lane.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate northbound right-turn lane, in addition to the second southbound left-turn lane. The northbound approach at this location currently consists of one left-turn lane, two through lanes, one

shared through-and-right turn lane, and an 8-foot wide bike lane. Implementation of the separate northbound right-turn lane would require the widening of the east side of Bowers Avenue (south of Scott Boulevard) by a minimum of 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane). The widening of the east side of Bowers Avenue would require right-of-way acquisition and partial removal of landscape and two trees along the east side of Bowers Avenue to accommodate a 5-foot sidewalk on this side of the street, in addition to the separate northbound right-turn lane.

Therefore, the required mitigation of the identified project impact at the intersection will consist of implementation of a separate northbound right-turn lane and a fair-share contribution towards the planned second southbound left-turn lane. With implementation of these improvements, the intersection level of service is projected to improve to acceptable LOS E during both the AM and PM peak hours, reducing the project impact to ***less than significant***.

(21) San Tomas Expressway and Scott Boulevard (CMP Intersection)

Impact: This City of Santa Clara and CMP intersection would operate at an unacceptable LOS F during the PM peak hour under background conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 4.9 seconds and the volume-to-capacity ratio (V/C) to increase by 0.012 during the PM peak-hour. Based on CMP level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a Tier 1C and a Tier 2 priority improvement (identified below) as mitigation to their project impact.

The addition of a second westbound right-turn lane at this intersection has been identified as a Tier 1C priority improvement in the Comprehensive County Expressway Planning Study 2008 Update, March 2009, and is included in the City of Santa Clara Traffic Mitigation Program, June 2011. The intersection delay would slightly improve (from 93.5 seconds to 92.9 seconds) with implementation of this improvement, however, the intersection is projected to continue to operate deficiently during the PM peak-hour and the project impact would continue to be significant. Additionally, an interchange has been identified at this intersection as a Tier 2 priority improvement in the Comprehensive County Expressway Planning Study.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards the above short-term (second westbound right-turn lane) and long-term (interchange) improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

(23) San Tomas Expressway and Monroe Street (CMP Intersection)

Impact: This City of Santa Clara and CMP intersection would operate at an acceptable LOS E during the AM and PM peak hours under background conditions. The addition of project traffic would cause the intersection's level of service to deteriorate to an unacceptable LOS F during the PM peak-hour. Based on CMP level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has

identified a fair-share contribution towards the implementation of a Tier 3 priority improvement (identified below) as mitigation to their project impact.

The addition of a second northbound left-turn lane at this intersection has been identified as a Tier 3 priority improvement in the Comprehensive County Expressway Planning Study Policy Advisory Board 2015 Update, March 23, 2015. Implementation of the above improvement, however, is not projected to improve intersection operating conditions with the project and the project impact would continue to be significant.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a fourth southbound through lane. This improvement, however, would require the widening of San Tomas Expressway, which is not be feasible due to right-of-way constraints, or converting the existing HOV lane to a mixed-flow lane.

Additionally, this intersection is one of seven CMP intersections identified in the Santa Clara Multimodal Improvement Plan. The Multimodal Improvement Plan has determined that localized mitigation for the identified seven CMP facilities is not feasible or would be undesirable in light of other city goals and policies and identifies a set of actions and programs that can be implemented to improve system-wide transportation conditions and air quality in the City of Santa Clara.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards planned improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

(28) Lakeside Drive and Augustine Drive (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an acceptable LOS C and D during the AM and PM peak hours, respectively, under background conditions. The addition of project traffic would cause the intersection's level of service to deteriorate to an unacceptable LOS F during both peak hours. Based on City of Santa Clara level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. The significant impact at this intersection could be satisfactorily mitigated with the modification of the eastbound/westbound approaches of the intersection to include one shared left-and-through and one right-turn lane in the westbound approach and one share left-and-through and one shared right-and-through lane in the eastbound approach. These improvements also would require changing the signal phasing from protected to split phasing in the eastbound/westbound direction. Implementation of the above improvements would improve the intersection's operating conditions to LOS C and D during the AM and PM peak hours, respectively, under background plus project conditions, reducing the project impact to ***less than significant.***

(38) Oakmead Parkway/Corvin Drive and Central Expressway (CMP Intersection)

Impact: This City of Sunnyvale and CMP intersection would operate at an acceptable LOS E under background conditions. The addition of project traffic would cause the intersection's level of service to deteriorate to an unacceptable LOS F during the AM and PM peak hours. Based on CMP level of service impact criteria, this constitutes a significant project impact.

Mitigation Measure. The significant impact at this intersection could be satisfactorily mitigated with the addition of a second eastbound left-turn lane. Implementation of the above improvement would improve

the intersection's operating conditions to LOS E during both peak hours, reducing the project impact to less than significant.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards the above improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

6. Cumulative Conditions

This chapter describes the roadway traffic operations under cumulative conditions and cumulative plus project conditions. Cumulative conditions represent future traffic conditions with expected growth in the area. The expected future traffic growth conditions include approved and pending projects in Santa Clara, Sunnyvale, and San Jose. Included in this chapter are the procedures used to determine cumulative traffic volumes and a description of the resulting traffic conditions and any impacts caused by the project. The analysis of cumulative conditions is required by the CMP and is in conformance with the California Environmental Quality Act CEQA.

Transportation Network Under Cumulative Conditions

It is assumed in this analysis that the transportation network under cumulative conditions would be the same as described under background conditions.

Cumulative Traffic Volumes

Traffic volumes under cumulative conditions were estimated by adding the trips from approved developments, estimated project trips, and trips from proposed but not yet approved (pending) development projects within the Cities of Santa Clara and Sunnyvale. Lists of pending projects within the Cities of Santa Clara and Sunnyvale can be found in Appendix D. In addition, cumulative conditions also include trips associated with development of Phase 2 of the approved North San Jose Development Policy. Phases 1-3 only of the City Place project and their corresponding intersection improvements, as assumed under background conditions, were assumed to be implemented under cumulative conditions.

Figures 12 and 13 show the cumulative no project and cumulative with project traffic volumes, respectively. The lists of pending projects for both the Cities of Santa Clara and Sunnyvale are included in Appendix D. Trips associated with development of Phases 2 of the approved North San Jose Development Policy, as well as all other traffic components used to tabulate cumulative traffic volumes, are listed within the volume summary tables included in Appendix B.

Cumulative Conditions Significant Impact Criteria

In the Cities of Santa Clara and Sunnyvale, a significant cumulative traffic impact at an intersection is identified by comparing cumulative with project traffic conditions against cumulative no project traffic conditions. A significant cumulative traffic impact at a City of San Jose intersection is identified by comparing cumulative with project traffic conditions against background traffic conditions.

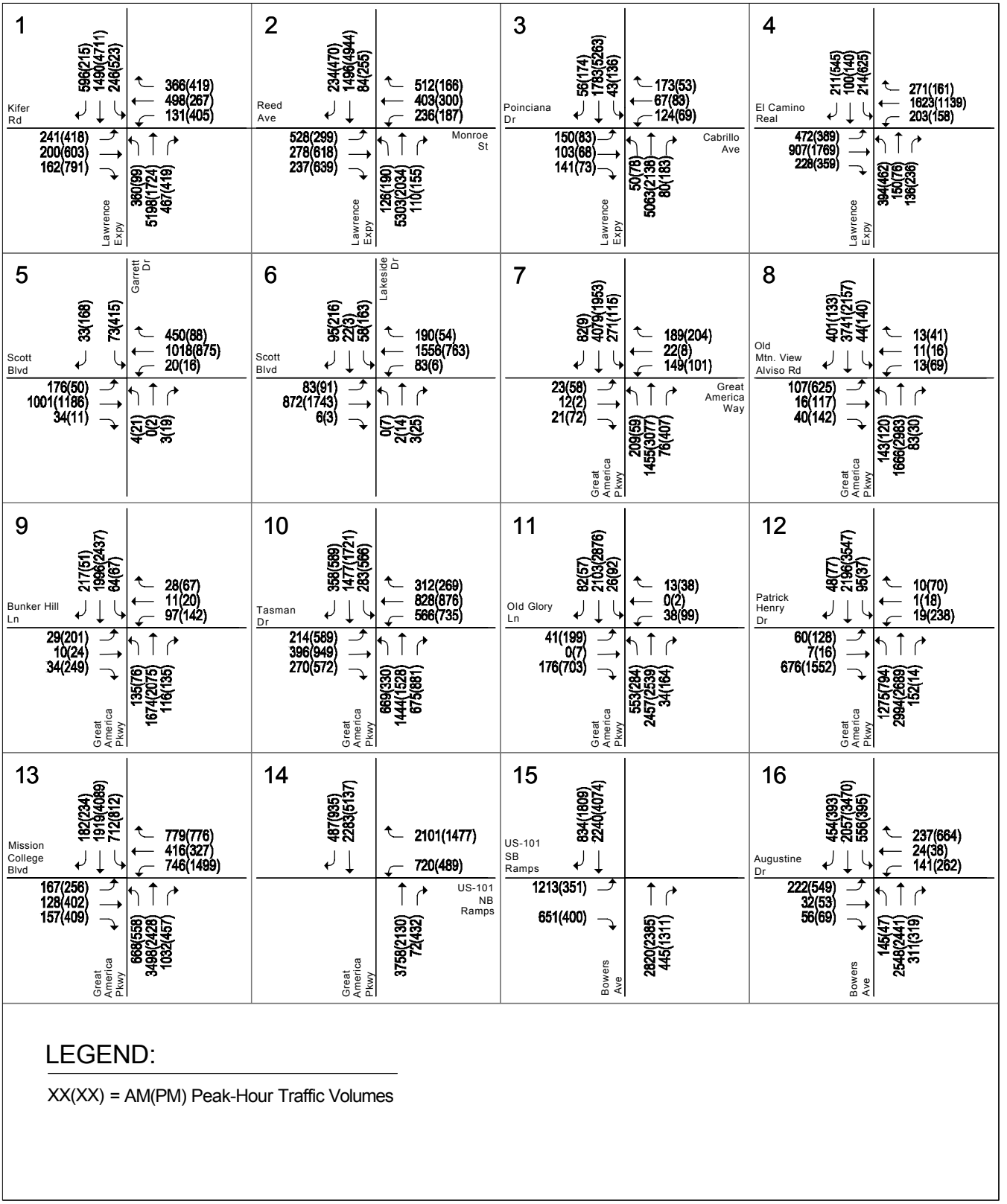


Figure 12
Cumulative No Project Traffic Volumes

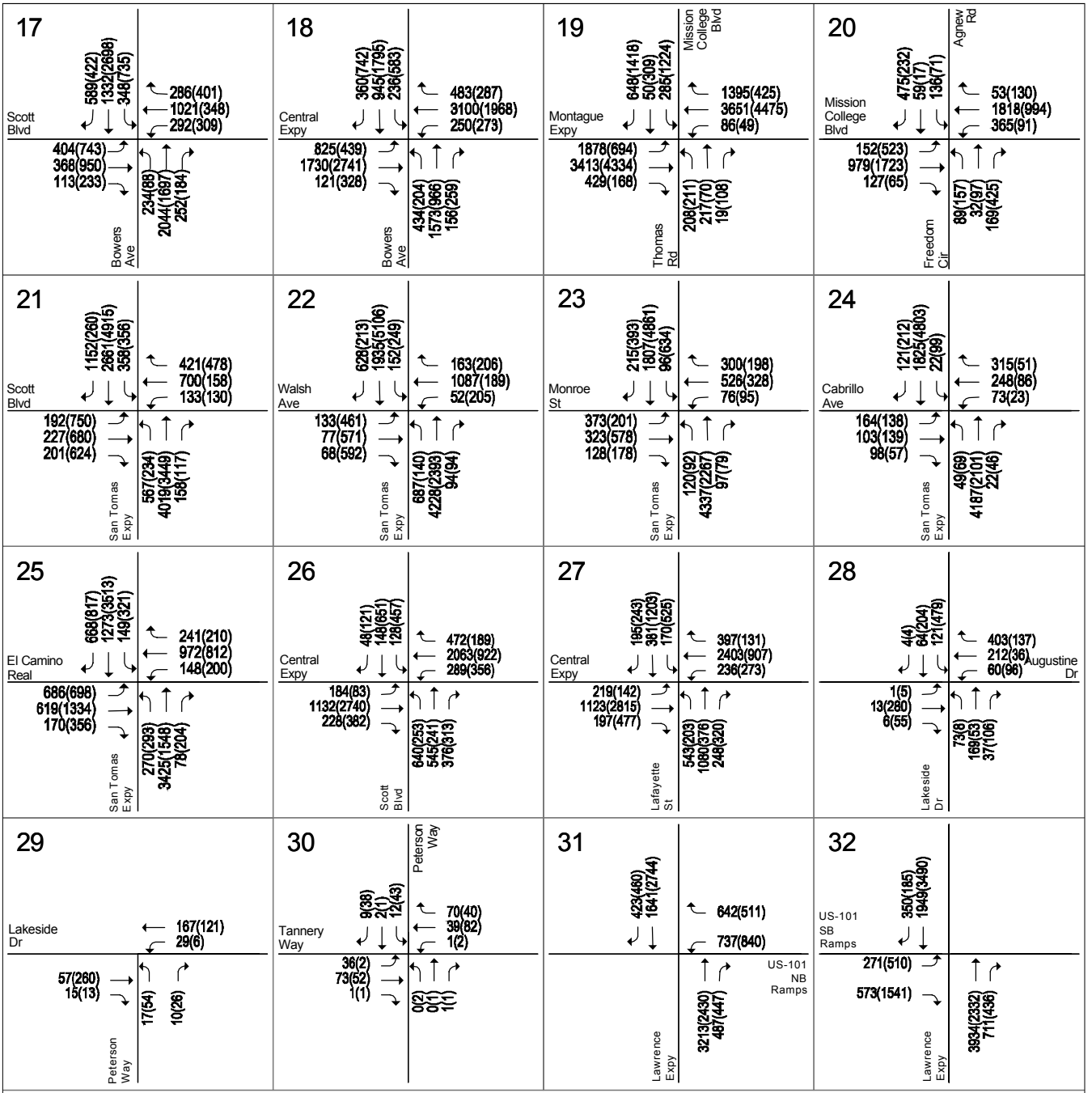
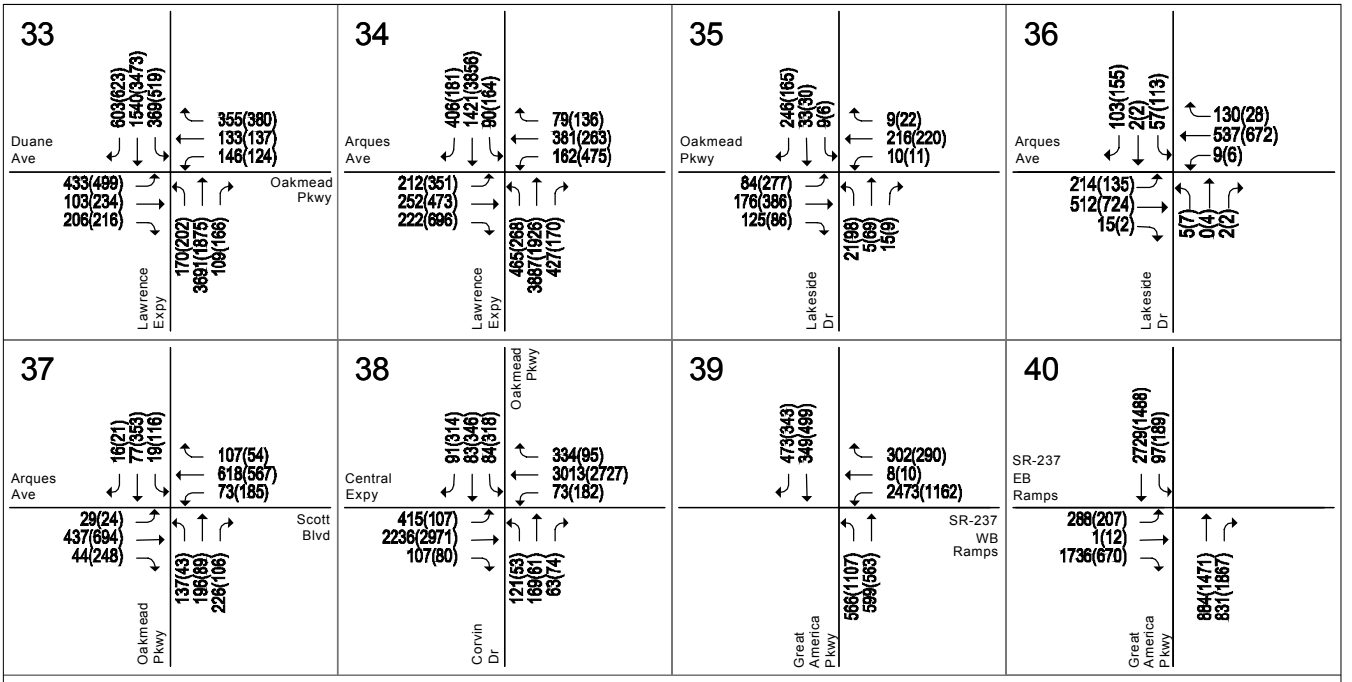


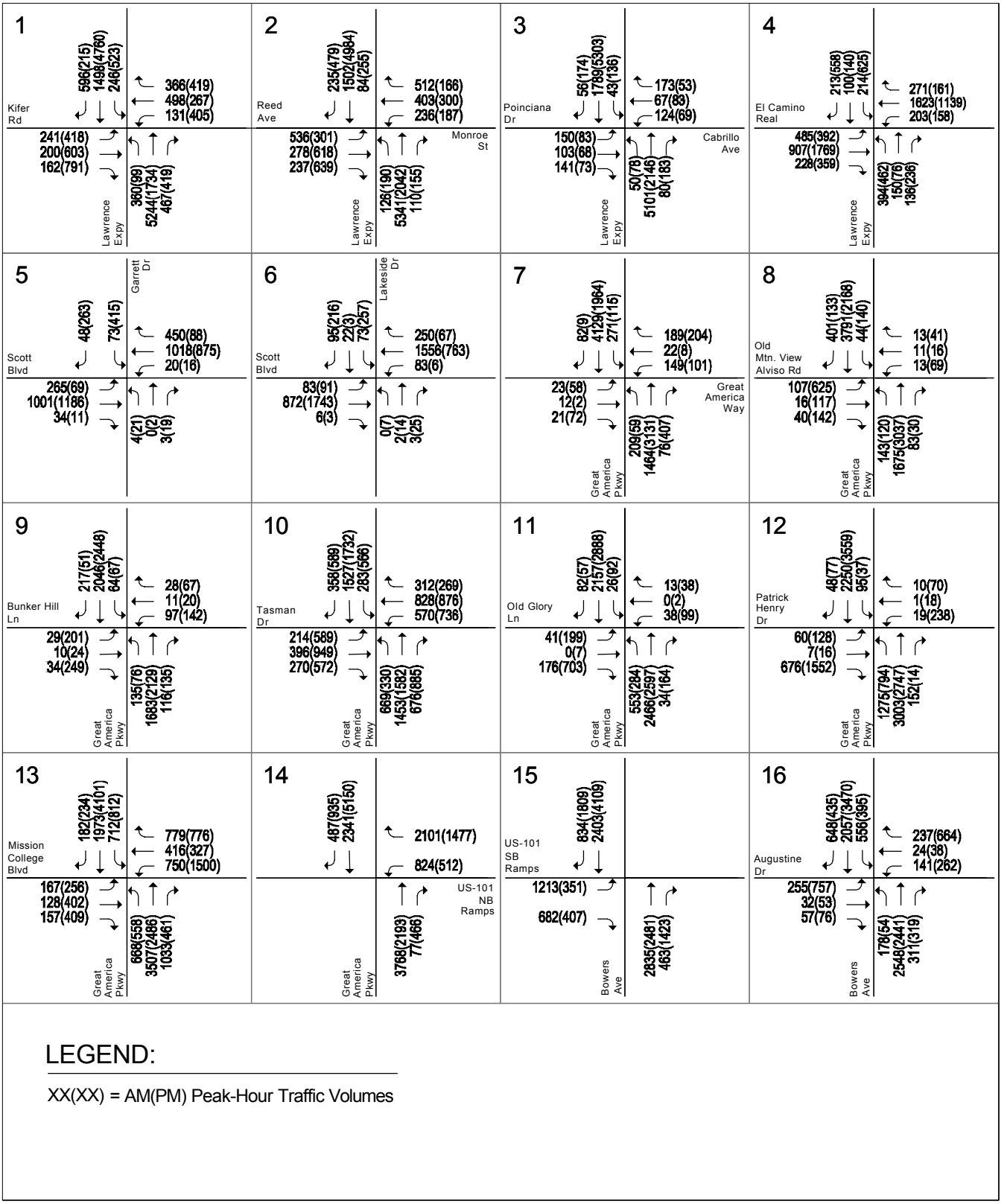
Figure 12 (Continued)
Cumulative No Project Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

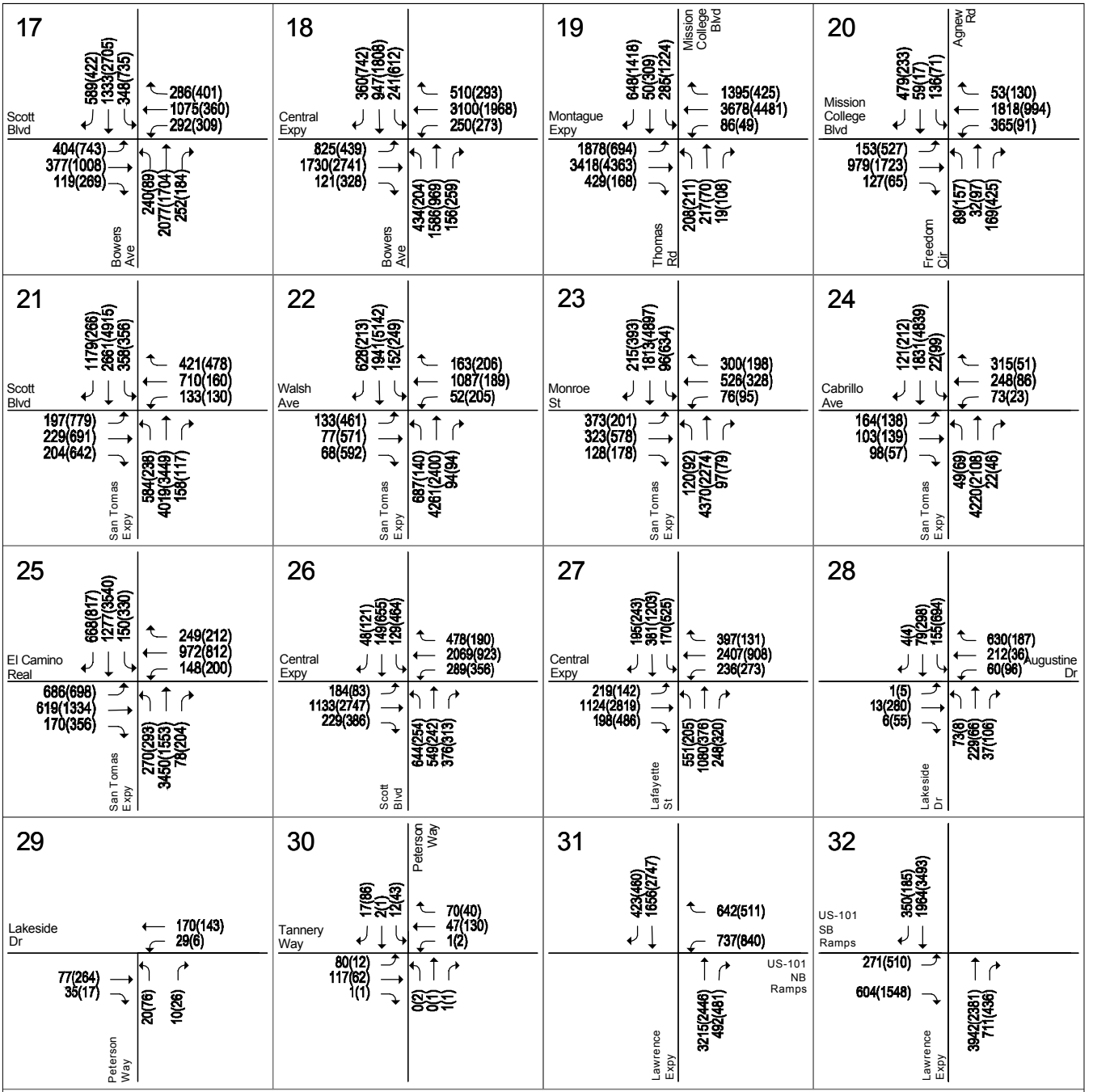
Figure 12 (Continued)
Cumulative No Project Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

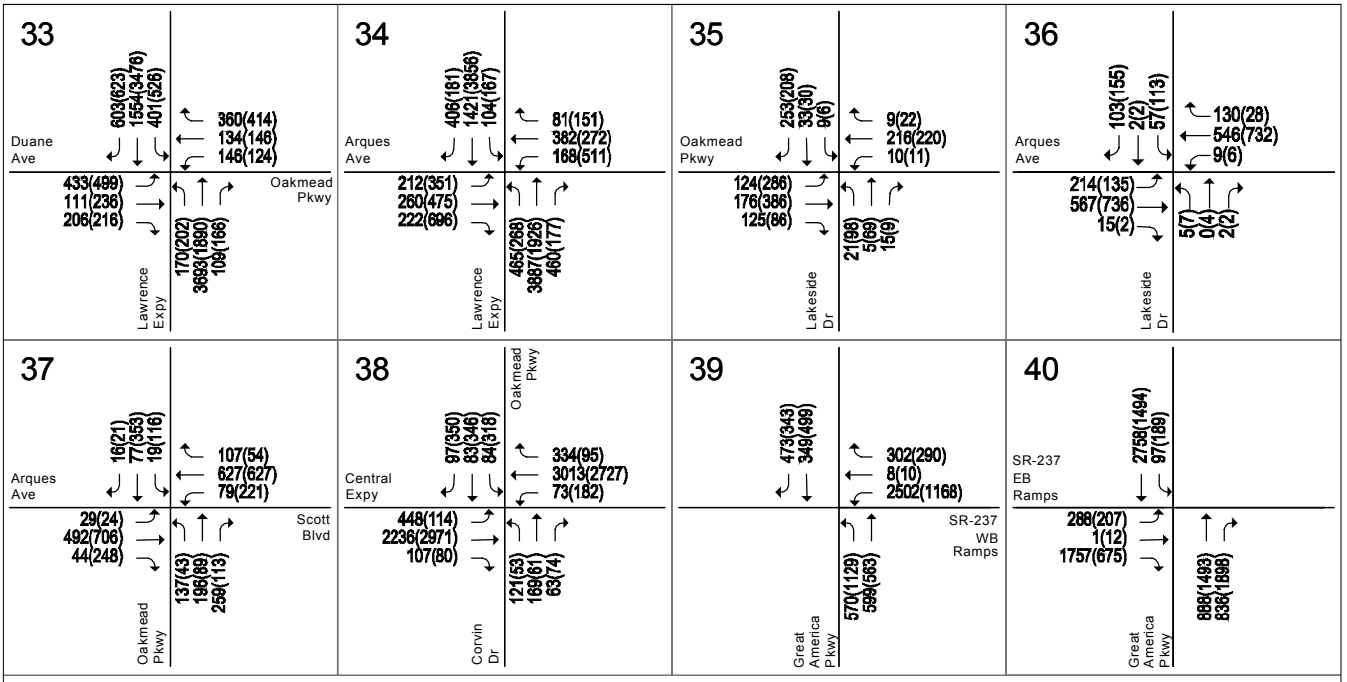
Figure 13
Cumulative Plus Project Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 13 (Continued)
Cumulative Plus Project Traffic Volumes



LEGEND:

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 13 (Continued)
Cumulative Plus Project Traffic Volumes

Cities of Santa Clara and Sunnyvale Definition of Significant Intersection LOS Impacts

According to the Cities of Santa Clara and Sunnyvale level of service guidelines, a development is said to create a significant adverse impact on traffic conditions at a non-CMP signalized intersection if for either peak hour:

1. The level of service at the intersection degrades from an acceptable level (LOS D or better at all city-controlled intersections and LOS E or better at all expressway intersections) under cumulative no project conditions to an unacceptable level (LOS E or F at city-controlled intersections and LOS F at expressway intersections) under cumulative conditions, or
2. The level of service at the intersection is an unacceptable level (LOS E or F at city-controlled intersections and LOS F at expressway intersections) under cumulative no project conditions and the addition of project trips causes the average critical delay to increase by four (4) or more seconds *and* the volume-to-capacity ratio (V/C) to increase by one percent (0.01) or more.

An exception to this rule applies when the addition of project traffic reduces the amount of average delay for critical movements (i.e., the change in average delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by 0.01 or more.

A significant impact by the Cities of Santa Clara and Sunnyvale standards is said to be satisfactorily mitigated when measures are implemented that would restore intersection level of service to an acceptable level or no worse than cumulative no project conditions.

City of San Jose Definition of Significant Intersection Impacts

The cumulative projects collectively would create a significant adverse impact on traffic conditions at a signalized intersection in the City of San Jose if during either the AM or PM peak hour:

1. The level of service at the intersection degrades from an acceptable LOS D or better under background conditions to an unacceptable LOS E or F under cumulative conditions, or
2. The level of service at the intersection is an unacceptable LOS E or F under background conditions and the addition of cumulative project trips causes both the critical-movement delay at the intersection to increase by four (4) or more seconds and the volume-to-capacity ratio (V/C) to increase by one percent (.01) or more.

An exception to criteria 2 applies when the addition of project traffic reduces the amount of average stopped delay for critical movements (i.e., the change in average stopped delay for critical movements is negative). In this case, the threshold of significance is an increase in the critical V/C value by .01 or more.

A significant impact by City of San Jose standards is said to be satisfactorily mitigated when measures are implemented that would restore intersection level of service to background conditions or better.

Project Contribution to Cumulative Impacts

A single project's contribution to a cumulative intersection impact is deemed considerable in the City of San Jose if the proportion of project traffic represents 25 percent or more of the increase in total volume from background traffic conditions to cumulative traffic conditions.

CMP Definition of Significant Intersection Impacts

The definition of a significant impact at a CMP intersection is the same as for the Cities of Santa Clara and Sunnyvale, except that the CMP standard for acceptable level of service at a CMP intersection is LOS E or better. A significant impact by CMP standards is said to be satisfactorily mitigated when

measures are implemented that would restore intersection level of service to cumulative no project conditions or better.

Intersection Levels of Service under Cumulative Conditions

Cumulative plus project conditions were evaluated relative to cumulative conditions for City of Santa Clara and City of Sunnyvale study intersections and to background conditions for City of San Jose intersections in order to determine potential project impacts. Level of service results for cumulative conditions are summarized in Table 11. The results show that, measured against the applicable municipal and CMP level of service standards, the following 22 study intersections are projected to operate at an unacceptable level of service (LOS E or worse for locally controlled intersections and LOS F for CMP and expressway intersections) under cumulative plus project conditions (CMP intersections are denoted with an asterisk*):

City of Santa Clara Intersections

1. Lawrence Expressway and Kifer Road (LOS F – AM and PM)
2. Lawrence Expressway and Monroe Street/Reed Avenue* (LOS F – AM and PM)
3. Lawrence Expressway and Cabrillo Avenue (LOS F – AM and PM)
7. Great America Parkway and Great America Way (LOS F – AM peak-hour)
   (**Impact**: AM peak-hour)
8. Great America Parkway and Old Mountain View-Alviso Road (LOS E – AM peak-hour)
   (**Impact**: AM peak-hour)
12. Great America Parkway and Patrick Henry Drive (LOS E – PM peak-hour)
13. Great America Parkway and Mission College Boulevard* (LOS F – PM peak-hour)
16. Bowers Avenue and Augustine Drive (LOS F – PM peak-hour)
    (**Impact**: PM peak-hour)
17. Bowers Avenue and Scott Boulevard* (LOS F – AM and PM)
    (**Impact**: AM peak-hour)
18. Bowers Avenue and Central Expressway* (LOS F – AM and PM)
19. Mission College Boulevard/Thomas Road and Montague Expwy* (LOS F – AM and PM)
20. Agnew Road/Freedom Circle and Mission College Boulevard (LOS E – PM peak-hour)
21. San Tomas Expressway and Scott Boulevard* (LOS E – AM, LOS F – PM)
    (**Impact**: AM and PM peak-hours)
22. San Tomas Expressway and Walsh Avenue (LOS F – AM and PM)
23. San Tomas Expressway and Monroe Street* (LOS F – PM peak-hour)
25. San Tomas Expressway and El Camino Real* (LOS F – AM and PM)
26. Scott Boulevard and Central Expressway* (LOS F – PM peak-hour)
27. Lafayette Street and Central Expressway* (LOS F – AM and PM)
28. Lakeside Drive and Augustine Drive (LOS F – AM and PM)
    (**Impact**: AM and PM peak hours)

City of Sunnyvale Intersections

34. Lawrence Expressway and Arques Avenue* (LOS F – PM peak-hour)
38. Oakmead Parkway/Corvin Drive and Central Expressway* (LOS F – AM and PM)
    (**Impact**: AM peak-hour)

City of San Jose Intersections

39. Great America Parkway and SR 237 Westbound Ramps* (LOS E – AM peak-hour)

Table 11
Cumulative Conditions Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Cumulative Avg. Delay	Cumulative LOS	Cumulative Plus Project Avg. Delay	Cumulative Plus Project LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Lawrence Expressway and Kifer Road	E	AM	03/07/18	**120.5**	**F**	**122.9**	**F**	**+3.6**	**0.008**
			PM	03/07/18	**144.7**	**F**	**147.0**	**F**	**+3.9**	**0.007**
2	Lawrence Expressway and Monroe Street/Reed Avenue*	E	AM	03/07/18	**152.4**	**F**	**155.0**	**F**	**+3.7**	**0.009**
			PM	10/05/16	**126.8**	**F**	**128.6**	**F**	**+2.9**	**0.006**
3	Lawrence Expressway and Cabrillo Avenue	E	AM	03/07/18	**102.8**	**F**	**105.5**	**F**	**+3.6**	**0.006**
			PM	03/07/18	**83.8**	**F**	**86.1**	**F**	**+3.5**	**0.006**
4	Lawrence Expressway and El Camino Real*	E	AM	03/07/18	38.4	D+	38.5	D+	+0.3	0.005
			PM	11/10/16	38.7	D+	38.8	D+	0.0	0.000
5	Garrett Drive and Scott Boulevard	D	AM	08/30/16	10.0	A	12.2	B	+3.6	0.064
			PM	08/30/16	16.5	B	16.5	B	0.0	0.000
6	Lakeside Drive and Scott Boulevard	D	AM	08/30/16	11.3	B+	11.6	B+	+0.6	0.026
			PM	08/30/16	11.3	B+	12.9	B	+2.7	0.035
7	Great America Parkway and Great America Way	D	AM	01/26/16	**111.4**	**F**	**115.2**	**F**	**+5.2**	**0.011**
			PM	01/26/16	47.4	D	51.7	D-	+6.7	0.012
8	Great America Parkway and Old Mountain View-Alviso Road	D	AM	01/26/16	**75.9**	**E-**	**79.8**	**E-**	**+5.4**	**0.011**
			PM	01/26/16	52.9	D-	54.7	D-	+3.0	0.011
9	Great America Parkway and Bunker Hill Lane	D	AM	01/26/16	11.9	B+	11.9	B+	0.0	0.011
			PM	01/26/16	24.1	C	24.1	C	0.0	0.002
10	Great America Parkway and Tasman Drive*	E	AM	03/07/18	51.1	D-	51.3	D-	+0.4	0.010
			PM	11/17/16	66.9	E	67.8	E	+1.0	0.003
11	Great America Parkway and Old Glory Lane	D	AM	01/26/16	19.7	B-	20.1	C+	+0.7	0.012
			PM	01/26/16	54.2	D-	54.5	D-	+0.7	0.002
12	Great America Parkway and Patrick Henry Drive	D	AM	01/26/16	52.4	D-	54.9	D-	+4.4	0.011
			PM	01/26/16	**79.5**	**E-**	**79.7**	**E-**	**+1.0**	**0.002**
13	Great America Parkway and Mission College Boulevard*	E	AM	03/07/18	63.3	E	63.4	E	+0.4	0.001
			PM	12/06/16	**121.1**	**F**	**122.4**	**F**	**+0.8**	**0.002**
14	Great America Parkway and US 101 Northbound Ramps*	E	AM	01/26/16	18.4	B-	24.9	C	+9.1	0.038
			PM	11/17/16	53.2	D-	56.4	E+	+4.7	0.010
15	Bowers Avenue and US 101 Southbound Ramps*	E	AM	01/26/16	24.8	C	25.3	C	+0.4	0.003
			PM	11/17/16	9.6	A	9.7	A	+0.3	0.006
16	Bowers Avenue and Augustine Drive	D	AM	08/30/16	47.9	D	48.0	D	0.0	0.001
			PM	08/30/16	**84.0**	**F**	**104.3**	**F**	**+25.3**	**0.057**
17	Bowers Avenue and Scott Boulevard*	E	AM	11/07/17	**120.5**	**F**	**129.5**	**F**	**+12.4**	**0.023**
			PM	11/16/16	**124.3**	**F**	**130.8**	**F**	**+0.6**	**0.001**
18	Bowers Avenue and Central Expressway*	E	AM	11/07/17	**108.7**	**F**	**109.2**	**F**	**+1.1**	**0.004**
			PM	10/05/16	**123.5**	**F**	**126.0**	**F**	**+53.9**	**-0.011**
19	Mission College Boulevard/Thomas Road and Montague Expressway*	E	AM	11/07/17	**227.8**	**F**	**229.0**	**F**	**0.0**	**0.000**
			PM	10/04/16	**235.2**	**F**	**236.0**	**F**	**+0.5**	**0.001**
20	Agnew Road/Freedom Circle and Mission College Boulevard	D	AM	11/29/16	36.5	D+	36.8	D+	+0.4	0.003
			PM	11/29/16	**57.6**	**E+**	**57.9**	**E+**	+0.8	0.003
21	San Tomas Expressway and Scott Boulevard*	E	AM	11/07/17	52.6	D-	**55.0**	**E+**	**+9.2**	**0.025**
			PM	10/04/16	**117.6**	**F**	**120.8**	**F**	**+4.6**	**0.012**
22	San Tomas Expressway and Walsh Avenue	E	AM	11/07/17	**122.0**	**F**	**123.7**	**F**	**+2.7**	**0.005**
			PM	03/07/18	**157.4**	**F**	**159.7**	**F**	**+3.3**	**0.006**
23	San Tomas Expressway and Monroe Street*	E	AM	11/07/17	73.3	E	74.9	E	+2.6	0.005
			PM	10/04/16	**105.6**	**F**	**107.7**	**F**	**+3.7**	**0.006**
24	San Tomas Expressway and Cabrillo Avenue	E	AM	11/07/17	41.7	D	43.0	D	+1.9	0.005
			PM	03/07/18	51.1	D-	52.4	D-	+2.0	0.005
25	San Tomas Expressway and El Camino Real*	E	AM	11/07/17	**116.7**	**F**	**118.2**	**F**	**+2.4**	**0.005**
			PM	10/04/16	**139.2**	**F**	**140.9**	**F**	**+3.1**	**0.005**
26	Scott Boulevard and Central Expressway*	E	AM	11/07/17	45.8	D	45.9	D	+0.1	0.003
			PM	10/04/16	**96.1**	**F**	**97.4**	**F**	+1.1	0.003
27	Lafayette Street and Central Expressway*	E	AM	11/07/17	**83.6**	**F**	**84.2**	**F**	**+1.9**	**0.004**
			PM	10/04/16	**119.4**	**F**	**119.4**	**F**	**+0.2**	**0.002**
28	Lakeside Drive and Augustine Drive	D	AM	03/07/18	27.8	C	**85.4**	**F**	**+69.9**	**0.264**
			PM	03/07/18	36.5	D+	**81.3**	**F**	**+67.4**	**0.182**

Table 11 (Continued)
Cumulative Conditions Intersection Levels of Service

Study Number	Intersection	LOS Standard	Peak Hour	Count Date	Cumulative Avg. Delay	Cumulative LOS	Cumulative Plus Project Avg. Delay	Cumulative Plus Project LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
31	Lawrence Expressway and US 101 Northbound Ramps	E	AM	03/07/18	10.6	B+	10.6	B+	0.0	0.000
			PM	03/07/18	12.7	B	12.7	B	0.0	0.000
32	Lawrence Expressway and US 101 Southbound Ramps	E	AM	08/30/16	14.1	B	16.0	B	+3.4	0.008
			PM	08/30/16	26.0	C	26.0	C	+0.1	0.002
33	Lawrence Expressway and Oakmead Parkway	E	AM	03/07/18	62.1	E	64.1	E	+3.7	0.013
			PM	03/07/18	56.3	E+	56.7	E+	+0.2	0.001
34	Lawrence Expressway and Arques Avenue*	E	AM	08/30/16	51.5	D-	51.6	D-	0.0	0.000
			PM	10/04/16	**115.5**	**F**	**116.0**	**F**	**+1.0**	**0.012**
35	Lakeside Drive and Oakmead Parkway	D	AM	03/07/18	20.3	C+	19.9	B-	+1.3	0.026
			PM	03/07/18	20.3	C+	20.0	B-	-0.1	0.006
36	Lakeside Drive and Arques Avenue	D	AM	08/30/16	22.4	C+	22.0	C+	-0.1	0.003
			PM	08/30/16	17.9	B	18.6	B-	+2.2	0.104
37	Oakmead Parkway and Arques Avenue/Scott Boulevard	D	AM	08/30/16	21.7	C+	21.8	C+	-0.1	0.003
			PM	08/30/16	26.2	C	26.5	C	+0.9	0.027
38	Oakmead Parkway/Corvin Drive and Central Expressway*	E	AM	11/07/17	**109.3**	**F**	**115.6**	**F**	**+11.1**	**0.020**
			PM	10/04/16	**113.0**	**F**	**113.1**	**F**	**0.0**	**0.000**
39	Great America Parkway and SR 237 Westbound Ramps*	D	AM	10/12/16	**59.1**	**E+**	**61.5**	**E**	**+3.0**	**0.008**
			PM	11/02/16	32.6	C-	33.8	C-	+1.4	0.009
40	Great America Parkway and SR 237 Eastbound Ramps*	D	AM	10/12/16	12.6	B	12.6	B	0.0	0.006
			PM	11/02/16	13.3	B	13.5	B	+0.4	0.010

Notes:
* Denotes CMP Intersections
Entries denoted in **bold** indicate conditions that exceed the applicable level of service standard.
Bold and boxed indicate significant project impact.

Based on the applicable level of service standards and significance criteria, seven of the above intersections would be significantly impacted by the proposed project under cumulative conditions. The impacts and proposed improvements to mitigate the impacts are described below.

All other study intersections are projected to operate at acceptable levels during both the AM and PM peak hours of traffic when measured against the applicable municipal and CMP level of service standards. The intersection level of service calculation sheets are included in Appendix C.

Unsignalized Intersection Analysis (Traffic Signal Warrants)

The unsignalized study intersections of Peterson Way/Lakeside Drive and Peterson Way/Tannery Way were analyzed for operational purposes. Unsignalized intersections are analyzed on the basis of the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the California *Manual on Uniform Traffic Control Devices* (MUTCD), 2014 Edition. This method makes no evaluation of intersection level of service, but simply provides an indication whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal.

The results of the peak-hour traffic signal warrant checks indicate that both of the unsignalized study intersections are projected to have traffic volumes that fall below the thresholds that warrant signalization under cumulative plus project conditions. The peak-hour signal warrant sheets are contained in Appendix E.

Cumulative Plus Project Impacts and Mitigation Measures

Described below are the possible intersection improvements for the cumulatively significant intersection impacts.

The mitigation measures listed below were developed based on information from the City Place Santa Clara Project Environmental Impact Report (EIR), dated April 2016.

(7) Great America Parkway and Great America Way (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an unacceptable LOS F during the AM peak hour under cumulative no project conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 5.2 seconds and the volume-to-capacity ratio (V/C) to increase by 0.011 during the AM peak-hour. Based on City of Santa Clara level of service impact criteria, this constitutes a cumulative project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified improvements (described under background conditions and included under background and cumulative conditions) as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

The necessary improvement to improve the intersection's operating conditions to acceptable levels consists of the addition of a fourth southbound through lane. This improvement, however, is not feasible due to right-of-way constraints. Therefore, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

(8) Great America Parkway and Old Mountain View-Alviso Road (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an unacceptable LOS F during the AM peak hour under cumulative no project conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 5.4 seconds and the volume-to-capacity ratio (V/C) to increase by 0.011 during the AM peak-hour. Based on City of Santa Clara level of service impact criteria, this constitutes a cumulative project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified improvements (described under background conditions and included under background and cumulative conditions) as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate southbound right-turn lane. The southbound approach at this location currently consists of one left-turn lane, three through lanes, and an 8-foot wide bike lane/right-turn lane. Implementation of the separate southbound right-turn lane improvement would require the widening of the west side of Great America Parkway (north of Old Mountain View/Alviso Road) by approximately 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane) for a distance of approximately 150 feet. The widening of the west side of Great America Parkway would require partial removal of landscape and the relocation of two traffic signal/utilities cabinets, a light pole, and a traffic signal pole. With implementation of the above improvement, the intersection level of service is projected to improve to an acceptable LOS D during the AM peak-hour, reducing the cumulative project impact to ***less than significant***.

(16) Bowers Avenue and Augustine Drive (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an unacceptable LOS F under cumulative no project conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 25.3 seconds and the volume-to-capacity ratio (V/C) to increase by 0.057 during the PM peak-hour. Based on City of Santa Clara level of service impact criteria, this constitutes a cumulative project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). However, the City Place EIR identified no feasible mitigations due to right-of-way restrictions and has determined their impact at this location to be significant and unavoidable.

The necessary improvements to improve the intersection's operating conditions to acceptable levels consists of the widening of Bowers Avenue to include four through lanes (with a separate right-turn lane in the southbound direction) in each the northbound and southbound directions. Implementation of these improvements is not feasible due to right-of-way constraints. Therefore, the cumulative project impact at this intersection is considered to be ***significant and unavoidable***.

(17) Bowers Avenue and Scott Boulevard (CMP Intersection)

Impact: This City of Santa Clara and CMP intersection would operate at an unacceptable LOS F under cumulative no project conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 12.4 seconds and the volume-to-capacity ratio (V/C) to increase by 0.023 during the AM peak-hour. Based on CMP level of service impact criteria, this constitutes a cumulative project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second southbound left-turn lane at this intersection as mitigation to their project impact.

Possible improvements at this location include the addition of a separate northbound right-turn lane, in addition to the second southbound left-turn lane. Implementation of the separate northbound right-turn lane would require the widening of the east side of Bowers Avenue (south of Scott Boulevard) by a minimum of 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane). The widening of the east side of Bowers Avenue would require right-of-way acquisition and partial removal of landscape and two trees along the east side of Bowers Avenue to accommodate a 5-foot sidewalk on this side of the street, in addition to the separate northbound right-turn lane. With implementation of the above improvements (both the southbound left-turn lane and the northbound right-turn lane), the intersection delays is projected to improve to better than no project conditions, reducing the cumulative project impact to less than significant; however, the intersection would continue to operate unacceptably (LOS F).

In order to improve the intersection's operating conditions to acceptable levels, in addition to the above improvements, the addition of a fourth northbound through lane and a separate southbound right-turn lane would be necessary. With these improvements, the intersection level of service is projected to improve to acceptable LOS E during the AM peak-hour. These improvements, however, would require the widening of Bowers Avenue which is not be feasible due to right-of-way constraints. Therefore, the cumulative project impact to this intersection is considered ***significant and unavoidable***.

(21) San Tomas Expressway and Scott Boulevard (CMP Intersection)

Impact: This City of Santa Clara and CMP intersection would operate at an unacceptable LOS D and F during the AM and PM peak hours, respectively, under cumulative no project conditions. The addition of project traffic would cause the intersection's level of service to deteriorate to an unacceptable LOS E during the AM peak-hour and the average critical-movement delay to increase by 4.6 and the volume-to-capacity ratio (V/C) to increase by 0.012 during the PM peak-hour. Based on CMP level of service impact criteria, this constitutes a cumulative project impact.

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second westbound right-turn lane (Tier 1C priority improvement in the Comprehensive County Expressway Planning Study 2008 Update, March 2009) and implementation of an interchange (Tier 2 priority improvement in the Comprehensive County Expressway Planning Study).

Therefore, mitigation of the identified cumulative project impact at the intersection will consist of a fair-share contribution towards the above short-term (second westbound right-turn lane) and long-term (interchange) improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

(28) Lakeside Drive and Augustine Drive (City of Santa Clara)

Impact: This City of Santa Clara intersection would operate at an acceptable LOS C and D during the AM and PM peak hours, respectively, under cumulative no project conditions. The addition of project traffic would cause the intersection's level of service to deteriorate to an unacceptable LOS F during both peak hours. Based on City of Santa Clara level of service impact criteria, this constitutes a cumulative project impact.

Mitigation Measure. The cumulative project impact at this intersection could be satisfactorily mitigated with the modification of the eastbound/westbound approaches of the intersection to include one shared left-and-through and one right-turn lane in the westbound approach and one share left-and-through and one shared right-and-through lane in the eastbound approach. These improvements also would require changing the signal phasing from protected to split phasing in the eastbound/westbound direction. Implementation of the above improvements would improve the intersection's operating conditions to LOS C and D during the AM and PM peak hours, respectively, under cumulative plus project conditions, reducing the cumulative project impact to ***less than significant***.

(38) Oakmead Parkway/Corvin Drive and Central Expressway (CMP Intersection)

Impact: This City of Sunnyvale and CMP intersection would operate at an unacceptable LOS F under cumulative no project conditions. The addition of project traffic would cause the intersection's average critical-movement delay to increase by 11.1 seconds and the volume-to-capacity ratio (V/C) to increase by 0.02 during the AM peak-hour. Based on CMP level of service impact criteria, this constitutes a cumulative project impact.

Mitigation Measure. The cumulative project impact at this intersection could be satisfactorily mitigated with the addition of a second eastbound left-turn lane. Implementation of the above improvement would improve the intersection's operating conditions to better than cumulative no project conditions, reducing the project impact to less than significant; however, the intersection would continue to operate at unacceptable LOS F during both peak hours.

The necessary improvements to improve the intersection's operating conditions to acceptable levels consist of the widening of Central Expressway to include three through lanes in each direction. The Central Expressway widening to three lanes in each direction from San Tomas Expressway to Lawrence Expressway is included as a Tier 3 improvement identified in the March 2015 update to the 2008 Countywide Expressway Study. Therefore, mitigation of the identified cumulative project impact at the intersection will consist of a fair-share contribution towards the above improvements.

Since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

7. Other Transportation Issues

This chapter presents other transportation issues associated with the project site, including:

- Site access and circulation
- Parking
- Vehicle queuing analysis
- Freeway ramp operations analysis
- Potential Impacts on Pedestrian, Bicycle, and Transit Facilities

Unlike the level of service impact methodology, which is adopted by the City Council, the analyses in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Site Access and Circulation

Site access and on-site circulation were evaluated using commonly accepted transportation planning principles. This review is based on a project site plan prepared by ARC TEC dated March 6, 2018 (see Figure 2).

The site plan shows the proposed office buildings and associated amenities to be located in the middle of the site, surrounded by the proposed parking structure (to the north) and surface parking areas (to the east, west, and south). The surface parking areas and parking structure would all be connected.

Site Access Evaluation

Vehicular access to the project site would be provided via two driveways along Peterson Way, two driveways along Tannery Way, and one driveway along Lakeside Drive. All project driveways would provide full access to/from the project site. The project driveways are shown on Figure 14 and are numbered 1 through 5 for ease of reference.

The two driveways on Peterson Way would be located approximately 60 feet from each other, and approximately 500 feet north of Tannery Way. Driveway 1 would provide direct access to the proposed parking garage while Driveway 2 would provide access to the parking area. A connection is shown on the site plan between these two driveways, providing access to both the parking garage and parking area from both driveways.

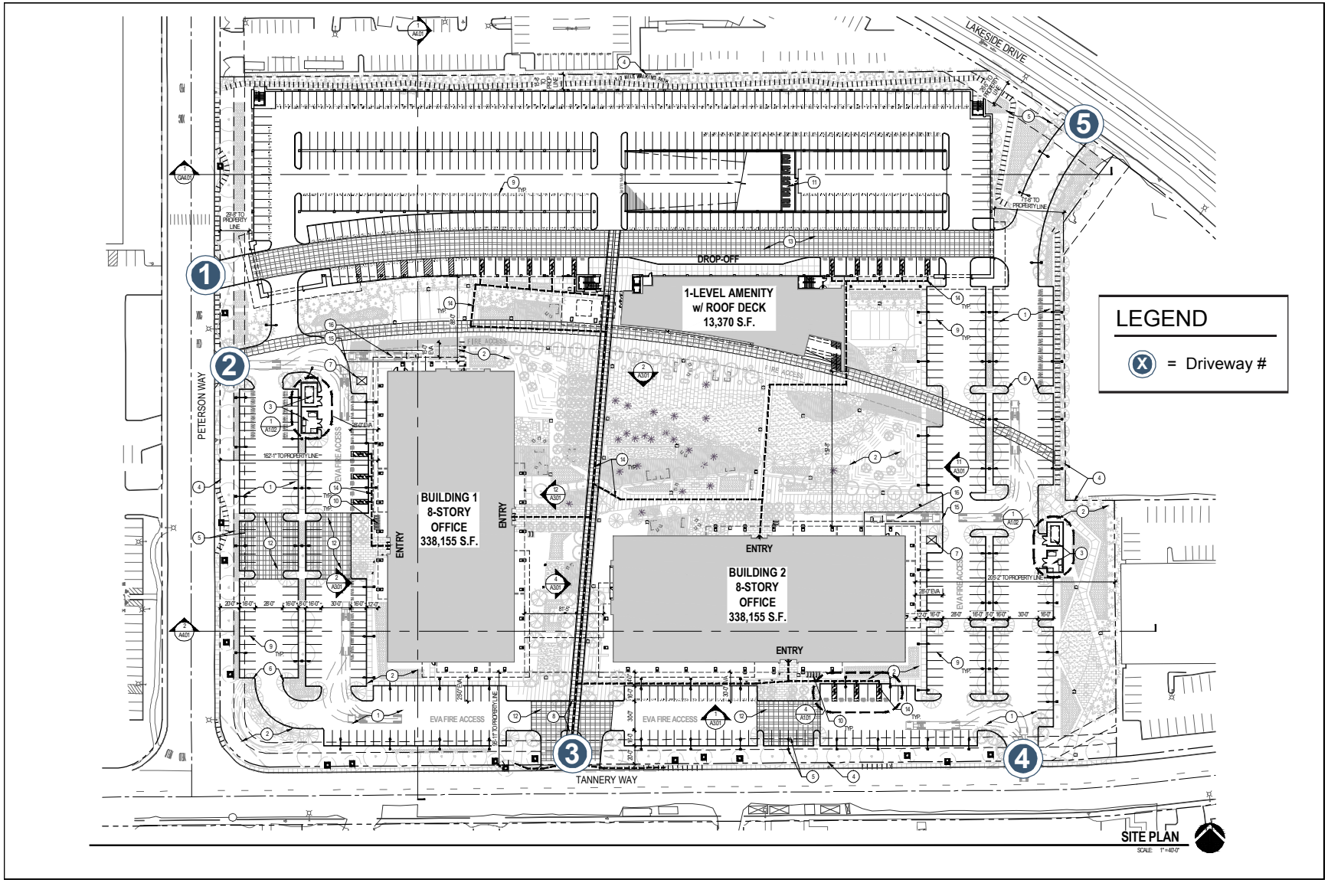


Figure 14
Project Site Driveways

Driveway 3 would be located approximately in the middle of the project site frontage on Tannery Way and it would provide direct access to the southern parking area. Driveway 4 would be located next to the eastern project site boundary and would provide direct access to the eastern parking area.

Driveway 5 along Lakeside Drive would provide direct access to both the parking garage and the eastern parking area.

All project driveways, with the exception of Driveway 3 along Tannery Way, are shown on the site plan to be 30 feet wide. Driveway 3 on Tannery Way is shown to be 60 feet wide, but includes a landscaped 20-foot center median that separates the 20-foot each inbound and outbound lanes. According to the City of Santa Clara Municipal Code, Chapter 18.74 (Parking Regulations), two-way driveways providing access to all properties other than residential shall be a minimum width of at least twenty-two (22) feet and a maximum width of 30 feet. Approaches to one-lane driveways may be 20 feet wide. Additionally, the City Code states that any abandoned driveways shall be reconstructed to standard City sidewalk, curb, and gutter requirements, concurrent with the new driveway construction. All existing driveways that are planned to be abandoned must adhere to these City requirements.

The proposed driveways would satisfy City of Santa Clara driveway design standards.

Sight Distance at the Driveways

A clear line of sight should be provided between the drivers at the project driveways and the approaching traffic. The Caltrans Highway Design Manual (HDM), dated November 2017, identifies the minimum stopping sight distances required for roadways with different design speeds. Stopping sight distance is the minimum distance for a given design speed that a driver needs in order to be able to see something on the road and stop before colliding.

The posted speed limit along Tannery Way is 25 miles per hour (mph), while the posted speed limit on Lakeside Drive is 35 mph. No speed limit signs are posted along Peterson Way, therefore, it is assumed that this roadway segment has a speed limit of 25 mph. According to the HDM, roadways with a design speed of 25 mph must provide a minimum stopping sight distance of 150 feet, while roadways with design speeds of 35 mph must provide a minimum stopping sight distance of 250 feet.

Both Peterson Way and Tannery Way are long and straight roadways and provide a clear line of sight from all project site driveways. Based on aerial images, a minimum of 400 feet of sight distance is provided at all project site driveways on Peterson and Tannery Ways.

Driveway 5 is located along a curving segment of Lakeside Drive, which results in limited sight distance. Nevertheless, aerial images and field observations show that the required stopping sight distance of 250 feet is currently provided at this driveway, as long as on-street parking along the southside of Lakeside Drive is prohibited for a minimum of 250 feet to the north/west and 100 feet to the south/east (between Driveway 5 and the adjacent driveways). “No Parking” signs are currently posted along this segment of Lakeside Drive and should be maintained in order to provide adequate stopping sight distance at Driveway 5.

In addition, Hexagon recommends that standard no parking zones be established adjacent to the project driveways on Peterson and Tannery Ways to ensure that exiting vehicles can see pedestrians on the sidewalk, as well as vehicles on the road. This will provide clear sight distance triangles at all project driveways to optimize sight distance. The site plan also shows various trees and shrubs adjacent to all project site driveways. The project must ensure that any landscaping and signage must be located in such a way to ensure an unobstructed view for drivers exiting the site.

Based on the posted speed limits, Caltrans design standards, and the above recommendations, adequate stopping sight distance is and would continue to be provided at all project site driveways.

Emergency Vehicle Access

All proposed project site driveways, with the exception of Driveway 3 on Tannery Way, would provide adequate width for larger vehicle (such as emergency vehicles, delivery trucks, and garbage trucks) to access the project site. The proposed landscaped center median at Driveway 3 separating the 20-foot access lanes potentially could obstruct access to vehicles that have a larger turn radius, such as emergency vehicles. Nevertheless, there is a minimum of one driveway that could accommodate emergency vehicle in and out access along each of the streets providing access to the project site.

A fire access plan was prepared by Arc Tec, dated March 6, 2018. The fire access plan shows the wheel travel path of a 47-foot long fire truck accessing the site via Driveways 2 (Peterson Way) and 5 (Lakeside Drive) and circulating throughout the site to access all surface parking areas and proposed buildings. The fire access plan also shows that the proposed pedestrian pathway located south of the parking structure also would function as a fire lane, providing emergency vehicle access to the common area located between the buildings and the parking structure.

Based on the driveway widths and proposed fire access plan, emergency vehicle access and circulation throughout the site would be adequate.

Pedestrian Access

The proposed project would provide sidewalks along its entire frontage on Peterson and Tannery Ways. With the available sidewalks and crosswalks along roadways and intersections in the vicinity of the project site, adequate pedestrian access to and from the project site to nearby pedestrian destinations would be provided.

Pedestrian pathways are shown throughout the project site, providing a connection between sidewalks on the adjacent streets, the proposed buildings, and other amenities on-site. Additionally, the project is proposing to construct a half-mile walking path along the perimeter of the project site, which would include the sidewalks along Peterson and Tannery Ways. Therefore, pedestrian access to all proposed facilities within the project site would be adequate.

On-Site Circulation

The on-site circulation was reviewed in accordance with the City of Santa Clara Zoning Ordinance and generally accepted traffic engineering standards. The project would provide 90-degree parking throughout the surface parking areas and within the proposed parking structure. All surface drive aisles are shown on the site plan to be 28 to 30 feet wide, with 16-foot long parking stalls along both sides of the drive aisle. Parking spaces within the parking structure are shown to be 18 feet long with 24-, 25-, and 28-foot drive aisles. According to the City of Santa Clara Municipal Code, Chapter 18.74, compact parking spaces must be 16 feet long and 8 feet wide while standard parking spaces must be 18 feet long and 9 feet wide (10 feet wide if they are next to a wall). The City Code also states that the compact-size dimensions may be used for up to fifty percent (50%) of the required parking spaces. The proposed drive aisle widths, in combination with the parking dimensions, would provide sufficient room for vehicles to back out of the 90-degree parking stalls.

The multi-level parking structure would have two entrances at the southwest corner of the garage and two additional entrances at the southeast corner of the garage. The site plan shows that all four parking levels (three above-grade and one at-grade) would be accessible via all garage entrances.

The site plan also shows designated loading areas for delivery trucks located at the north side of both proposed buildings, which would be accessible via Driveways 2, 4, and 5. The site plan shows the wheel travel paths for delivery trucks adequately circulating through the site to access the truck loading docks at each building.

No dead-end aisles are being proposed, eliminating the need for vehicles to complete U-turns within the site. Additionally, all parking areas and parking structure would be connected, allowing drivers to circulate the site without having to enter and exit the site while looking for parking.

Based on the proposed circular layout of the project site, connectivity between all parking areas and parking structure, adequate drive aisle widths and turn radii, on-site vehicular circulation would be adequate.

Pedestrian On-Site Circulation

The site plan shows sidewalks along the project site's frontage on Peterson and Tannery Ways as well as pedestrian pathways throughout the project site, connecting to all on-site facilities and facilitating pedestrian circulation within the site. Additionally, the half-mile trail along the site perimeter would provide pedestrian access to all parts of the project site as well as the opportunity for pedestrians to exercise within the site.

Pedestrian access between the parking structure and the office buildings would be provided via the on-site pedestrian pathways and the half-mile trail. Stairs would be located at the northwest and northeast corners of the parking garage, and stairs and an elevator along the southern boundary of the garage.

A drop-off area is shown within the first level of the parking structure, along its southern boundary. Vehicles would be able to enter the parking structure via Driveway 1 (Peterson Way), drive through the first drive aisle to access the drop-off area, and continue to exit the site via Driveway 5 (Lakeside Drive). The on-site pedestrian pathways would connect directly to the drop-off area.

Based on the site plan layout and proposed pedestrian facilities, pedestrian access to all proposed facilities within the project site would be adequate.

Recommended Site Access and Circulation Improvements

The following recommendations are made to promote adequate site access and on-site circulation:

Prohibit On-Street Parking Adjacent to Project Driveways. On-street parking must continue to be prohibited adjacent to the project site driveway along Lakeside Drive (Driveway 5) in order to provide the required minimum stopping sight distance of 250 feet at this driveway. Additionally, Hexagon recommends that standard no parking zones be established adjacent to the project driveways on Peterson and Tannery Ways to ensure that exiting vehicles can see pedestrians on the sidewalk, as well as vehicles on the road.

Provide Clear Sight Triangles at Driveways. The project must ensure that any landscaping and signage located adjacent to the project driveways do not obstruct the view for drivers exiting the site.

Design of Project Site. The design of the project site, including but not limited to driveways, sidewalks, drive aisles, turn radii, parking stalls, and signage should adhere to City of Santa Clara design standards.

Parking

The parking analysis for the proposed office development is based on the City of Santa Clara's zoning code requirements and the *VTA Countywide Bicycle Plan Technical Guidelines*.

Vehicle Parking

The City of Santa Clara Municipal Code (Section 18.74.020) states that office developments are required to provide one space for each three hundred (300) square feet of gross floor area. Based on these standards, the proposed project (676,310 s.f. of office space and 13,370 s.f. amenities building)

would be required to provide 2,299 on-site parking spaces. However, assuming the proposed amenities building would be exclusive to on-site tenants, and therefore would not need to provide additional parking, the proposed office space only would be required to provide a total of 2,254 on-site parking spaces.

The site plan lists a total of 2,280 on-site parking spaces being proposed. Based on the calculated number of spaces for the entire project size (including the amenities building), the proposed number of parking spaces would be 19 spaces less than the required number of spaces. Based on the size of the office buildings only, the proposed number of parking spaces would be 26 spaces more than the number of spaces required.

Americans With Disabilities Act Compliance

The Americans with Disabilities Act (ADA) requires developments to provide 20 accessible parking space within parking lots with 1,000 or more total parking space, plus one additional parking space for every 100 parking spaces provided above 1,000 spaces. Accessible parking spaces shall be at least 96 inches (8 feet) wide and shall be located on the shortest accessible route of travel from adjacent parking to an accessible entrance. In addition, one in every 8 accessible spaces, but no less than one, shall be served by an access aisle at least 96 inches wide and shall be designated as “van accessible”. It should be noted that the accessible parking spaces are not additional parking spaces, but are part of the minimum parking spaces required.

Based on the above ADA requirements and the City of Santa Clara parking requirements, the proposed project must provide a total of 23 accessible parking spaces, with a minimum of 2 of the 23 spaces designated as van accessible spaces. The site plan lists a total of 32 accessible parking spaces (with 6 of them designated as van accessible) being proposed within the project site. Therefore, the proposed number of accessible parking spaces satisfies ADA parking requirements.

Bicycle Parking

The bicycle parking spaces were evaluated based on the requirements in the VTA Bicycle Technical Guidelines. VTA guidelines state that office developments are required to provide one bike space for each 6,000 square feet, with 75% as Class I (long-term) parking and 25% as Class II (short-term) parking. Based on VTA's guidelines, the proposed project would be required to provide a total of 115 bicycle parking spaces, with 86 long-term spaces and 29 short-term spaces.

The project proposes 60 short-term bicycle parking spaces and 180 long-term bicycle parking spaces. The proposed number of bicycle parking spaces exceeds the required number of long-term and short-term bicycle parking spaces.

Queuing Analysis

For selected high-demand movements at key intersections, the estimated maximum vehicle queues were compared to the existing or planned storage capacity. The queuing analysis is presented for informational purposes only, since neither the City of Santa Clara nor the CMP have defined any policies related to queuing. Vehicle queues were calculated using a Poisson probability distribution, which estimates the probability of “n” vehicles for a vehicle movement using the following formula:

$$P(x = n) = \frac{\lambda^n e^{-(\lambda)}}{n!}$$

Where:

P (x = n) = probability of “n” vehicles in queue per lane
n = number of vehicles in the queue per lane

λ = Average number of vehicles in the queue per lane (vehicles per hour per lane/signal cycles per hour)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles per signal cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future left-turn storage requirements at intersections. The 95th percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles. Likewise, a queue length larger than the 95th percentile queue would only occur on 5 percent of the signal cycles (about 3 cycles during the peak hour for a signal with a 60-second cycle length). Therefore, left-turn storage pocket designs based on the 95th percentile queue length would ensure that storage space would be exceeded only 5 percent of the time. The 95th percentile queue length is also known as the "design queue length".

A total of twelve left-turn movements at the following eleven intersections listed below were evaluated as part of the queuing analysis for this project:

5. Garrett Drive and Scott Boulevard – Eastbound left-turn movement
6. Lakeside Drive and Scott Boulevard – Southbound left-turn movement
16. Bowers Avenue and Augustine Drive – Eastbound and northbound left-turn movements
18. Bowers Avenue and Central Expressway – Southbound left-turn movement
21. San Tomas Expressway and Scott Boulevard – Eastbound left-turn movement
28. Lakeside Drive and Augustine Drive – Southbound left-turn movement
33. Lawrence Expressway and Oakmead Parkway – Southbound left-turn movement
34. Lawrence Expressway and Arques Avenue – Westbound left-turn movement
35. Lakeside Drive and Oakmead Parkway – Eastbound left-turn movement
37. Oakmead Parkway and Arques Avenue/Scott Boulevard – Westbound left-turn movement
38. Oakmead Parkway/Corvin Drive and Central Expressway – Eastbound left-turn movement

The results of the queuing analysis show that there is inadequate queue storage capacity for seven of the twelve left-turn movements analyzed (six intersections). The queuing analysis is presented in Table 12. Intersections projected to have left-turn queue storage deficiencies are discussed below.

5. Garrett Drive and Scott Boulevard

The eastbound left-turn queue length at the Garrett Drive/Scott Boulevard intersection is projected to exceed the existing capacity under background plus project conditions during the AM peak hour. Under background conditions, the 95th percentile queue length for this movement is estimated to be 4 vehicles (or 100 feet) and would be able to accommodate within the existing queue storage capacity of approximately 125 feet. With the addition of project trips, the 95th percentile queue is projected to increase by three vehicle (to 7 vehicles, or 175 feet) during the AM peak hour, exceeding the existing capacity by approximately 50 feet.

The eastbound left-turn pocket could be extended the additional 50 feet required to serve the projected queue length for this movement by removing a portion of the existing landscaped center median. However, extension of the left-turn pocket would require the removal of a tree located within this portion of the center median.

Table 12
Queuing Analysis Summary

Measurement	5. Garrett/ Scott		6. Lakeside/ Scott	16. Bowers/ Augustine			18. Bowers/ Central	21. San Tomas/ Scott	28. Lakeside/ Augustine		33. Lawrence/ Oakmead		34. Lawrence/ Arques	35. Lakeside/ Oakmead	37. Oakmead/ Arques	38. Oakmead/ Central
	EBL AM	EBL PM	SBL PM	EBL AM	EBL PM	NBL AM	SBL PM	EBL PM	SBL AM	SBL PM	SBL AM	SBL PM	WBL PM	EBL AM	WBL PM	EBL AM
Existing Conditions																
Cycle/Delay[1] (sec)	60	60	60	120	120	120	192	190	60	60	181	190	90	90	100	190
Lanes	1	1	2	3	3	1	2	2	1	1	2	2	2	1	1	1
Volume (vph)	80	32	159	193	508	80	172	429	121	479	295	422	406	84	114	270
Volume (vphpl)	80	32	80	64	169	80	86	215	121	479	148	211	203	84	114	270
Avg. Queue (veh/ln.)	1	1	1	2	6	3	5	11	2	8	7	11	5	2	3	14
Avg. Queue[2] (ft./ln)	33	13	33	54	141	67	115	283	50	200	185	278	127	53	79	356
95th %. Queue (veh/ln.)	3	2	3	5	10	6	8	17	5	13	12	17	9	5	6	21
95th %. Queue (ft./ln)	75	50	75	125	250	150	200	425	125	325	300	425	225	125	150	525
Storage (ft./ ln.)	125	125	150	250	250	100	450	175	475	475	200	200	250	300	150	750
Adequate (Y/N)	YES	YES	YES	YES	YES	**NO**	YES	**NO**	YES	YES	**NO**	**NO**	YES	YES	YES	YES
Existing Plus Project Conditions																
Cycle/Delay[1] (sec)	60	60	60	120	120	120	192	190	60	60	181	190	90	90	100	190
Lanes	1	1	2	3	3	1	2	2	1	1	2	2	2	1	1	1
Volume (vph)	169	51	253	226	716	113	201	458	155	694	327	429	442	124	150	303
Volume (vphpl)	169	51	127	75	239	113	101	229	155	694	164	215	221	124	150	303
Avg. Queue (veh/ln.)	3	1	2	3	8	4	5	12	3	12	8	11	6	3	4	16
Avg. Queue[2] (ft./ln)	70	21	53	63	199	94	134	302	65	289	206	283	138	78	104	400
95th %. Queue (veh/ln.)	6	3	5	5	13	7	9	18	5	17	13	17	10	6	8	23
95th %. Queue (ft./ln)	150	75	125	125	325	175	225	450	125	425	325	425	250	150	200	575
Storage (ft./ ln.)	125	125	150	250	250	100	450	175	475	475	200	200	250	300	150	750
Adequate (Y/N)	**NO**	YES	YES	YES	**NO**	**NO**	YES	**NO**	YES	YES	**NO**	**NO**	YES	YES	**NO**	YES
Background Conditions																
Cycle/Delay[1] (sec)	60	60	60	120	120	120	192	190	60	60	181	190	90	90	100	190
Lanes	1	1	2	3	3	1	2	2	1	1	2	2	2	1	1	1
Volume (vph)	109	37	163	222	547	136	531	713	121	479	354	517	443	84	173	376
Volume (vphpl)	109	37	82	74	182	136	266	357	121	479	177	259	221	84	173	376
Avg. Queue (veh/ln.)	2	1	1	2	6	5	14	19	2	8	9	14	6	2	5	20
Avg. Queue[2] (ft./ln)	45	15	34	62	152	113	354	471	50	200	222	341	138	53	120	496
95th %. Queue (veh/ln.)	4	2	3	5	10	8	21	26	5	13	14	20	10	5	9	27
95th %. Queue (ft./ln)	100	50	75	125	250	200	525	650	125	325	350	500	250	125	225	675
Storage (ft./ ln.)	125	125	150	250	250	100	450	175	475	475	200	200	250	300	150	750
Adequate (Y/N)	YES	YES	YES	YES	YES	**NO**	**NO**	**NO**	YES	YES	**NO**	**NO**	YES	YES	**NO**	YES
Background Plus Project Conditions																
Cycle/Delay[1] (sec)	60	60	60	120	120	120	192	190	60	60	181	190	90	90	100	190
Lanes	1	1	2	3	3	1	2	2	1	1	2	2	2	1	1	1
Volume (vph)	198	56	257	255	755	169	560	742	155	694	386	524	479	124	209	409
Volume (vphpl)	198	56	129	85	252	169	280	371	155	694	193	262	239	124	209	409
Avg. Queue (veh/ln.)	3	1	2	3	8	6	15	20	3	12	10	14	6	3	6	22
Avg. Queue[2] (ft./ln)	83	23	54	71	210	141	373	490	65	289	243	346	150	78	145	540
95th %. Queue (veh/ln.)	7	3	5	6	13	10	22	27	5	17	15	20	10	6	10	29
95th %. Queue (ft./ln)	175	75	125	150	325	250	550	675	125	425	375	500	250	150	250	725
Storage (ft./ ln.)	125	125	150	250	250	100	450	175	475	475	200	200	250	300	150	750
Adequate (Y/N)	**NO**	YES	YES	YES	**NO**	**NO**	**NO**	**NO**	YES	YES	**NO**	**NO**	YES	YES	**NO**	YES

[1] Vehicle queue calculations based on cycle length for signalized intersections and control delay for unsignalized intersections.
[2] Assumes 25 feet per vehicle in the queue.
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, R = Right, T = Through, L = Left.

16. Bowers Avenue and Augustine Drive

The eastbound and northbound left-turn queue lengths at the Bowers Avenue/Augustine Drive intersection are projected to exceed the existing capacity under background plus project conditions. Under background conditions, the 95th percentile queue length for the eastbound left-turn movement is estimated to be 10 vehicles (or 250 feet) per lane during the PM peak-hour and would be able to accommodate within the existing queue storage capacity of approximately 250 feet per lane. With the addition of project trips, the 95th percentile queue for this movement is projected to increase by three vehicle (to 13 vehicles, or 325 feet) per lane during the PM peak hour, exceeding the existing capacity by approximately 75 feet per lane.

The northbound left-turn queue length also is estimated to exceed the existing capacity under existing and background conditions. The 95th percentile queue length for the northbound left-turn movement is estimated to be 8 vehicles (or 200 feet) during the AM peak-hour under background conditions, exceeding the existing queue storage capacity of approximately 100 feet. With the addition of project trips, the 95th percentile queue is projected to increase by two vehicle (to 10 vehicles, or 250 feet) during the AM peak hour, exceeding the existing capacity by approximately 150 feet.

The eastbound left-turn storage cannot be increased because the turn pockets extend the full length of the eastbound approach to the upstream intersection of Lakeside Drive and Augustine Drive. The northbound left-turn pocket could only be extended approximately 100 feet (due to back-to-back left-turn lanes with the southbound left-turn movement at the Bowers Avenue/Scott Boulevard intersection) by removing a portion of the existing landscaped center median. However, extension of the northbound left-turn pocket would require the removal of a several trees located within the center median and the queue storage capacity would continue to be deficient by approximately 50 feet.

18. Bowers Avenue and Central Expressway

The southbound left-turn queue length at the Bowers Avenue/Central Expressway intersection is estimated to exceed the existing capacity under background and background plus project conditions during the PM peak-hour. The 95th percentile queue length for this movement is estimated to be 21 vehicles (or 525 feet) per lane during the PM peak-hour under background conditions, exceeding the existing queue storage capacity of approximately 450 feet per lane. With the addition of project trips, the 95th percentile queue is projected to increase by one vehicle per lane (to 22 vehicles, or 550 feet) during the PM peak hour, exceeding the existing capacity by approximately 100 feet per lane.

The southbound left-turn storage cannot be increased due to back-to-back left-turn lanes with the northbound left-turn pocket providing access to the existing land use at the northwest corner of the Bowers Avenue/Central Expressway intersection.

21. San Tomas Expressway and Scott Boulevard

The eastbound left-turn queue length at the San Tomas Expressway/Scott Boulevard intersection is estimated to exceed the existing capacity under existing, background, and background plus project conditions during the PM peak-hour. The 95th percentile queue length for this movement is estimated to be 26 vehicles (or 650 feet) per lane during the PM peak-hour under background conditions, exceeding the existing queue storage capacity of approximately 175 feet per lane. With the addition of project trips, the 95th percentile queue is projected to increase by one vehicle (to 27 vehicles, or 675 feet) per lane during the PM peak-hour, exceeding the existing capacity by approximately 500 feet per lane.

Extending the existing left-turn pockets and providing a third eastbound left-turn lane would be required to accommodate the projected vehicular queue length for this movement. However, due to back-to-back left-turn lanes with the westbound left-turn pocket at the upstream intersection as well as right-of-way constraints along Scott Boulevard, this improvement is not feasible. Alternatively, an interchange

also has been identified at this intersection as a Tier 2 priority project in the Comprehensive County Expressway Planning Study.

33. Lawrence Expressway and Oakmead Parkway

The southbound left-turn queue length at the Lawrence Expressway/Oakmead Parkway intersection is estimated to exceed the existing capacity under existing, background, and background plus project conditions during both peak hours. The 95th percentile queue length for this movement is estimated to be 14 and 20 vehicles (or 350 and 500 feet) per lane during the AM and PM peak hours, respectively, under background conditions, exceeding the existing queue storage capacity of approximately 200 feet per lane. With the addition of project trips, the 95th percentile queue is projected to increase by one vehicle (to 15 vehicles, or 375 feet) per lane during the AM peak hour, exceeding the existing capacity by approximately 175 feet per lane. During the PM peak hour, although the addition of project traffic is not projected to increase the 95th percentile vehicle queue length, the projected queue length would continue to exceed the existing queue storage capacity by approximately 300 feet per lane.

Extending the existing left-turn pockets and providing a third southbound left-turn lane would be required to accommodate the projected vehicular queue length for this movement. However, due to right-of-way constraints, this improvement is not feasible.

37. Oakmead Parkway and Arques Avenue/Scott Boulevard

The westbound left-turn queue length at the Oakmead Parkway/Arques Avenue intersection is estimated to exceed the existing capacity under background and background plus project conditions during the PM peak-hour. The 95th percentile queue length for this movement is estimated to be 9 vehicles (or 225 feet) during the PM peak-hour under background conditions, exceeding the existing queue storage capacity of approximately 150 feet. With the addition of project trips, the 95th percentile queue is projected to increase by one vehicle during the PM peak hour (to 10 vehicles, or 250 feet), exceeding the existing capacity by approximately 100 feet.

The westbound left-turn pocket could be extended the additional 100 feet required to serve the projected queue length for this movement by removing a portion of the existing landscaped center median. However, extension of the left-turn pocket would require the removal of several trees located within the center median.

Freeway Ramp Analysis

An analysis of metered freeway on-ramps providing access to the project site was performed to identify the effect of the addition of project traffic on the queues at metered study freeway on-ramps. Additionally, queue lengths at freeway off-ramps serving the project site also were evaluated to determine the adequacy of the freeway off-ramps to serve the projected vehicular queues.

It should be noted that the evaluation of freeway ramps is not required based on the City's transportation impact analysis guidelines, nor are there adopted methodologies and impact criteria for the analysis of freeway ramps.

Metered Freeway On-Ramp Analysis

It is projected that the project would result in the addition of peak hour trips to three freeway interchanges: (1) US 101 at Great America Parkway/Bowers Avenue, (2) US 101 at Lawrence Expressway, and (3) SR 237 at Great America Parkway. The study on-ramps were evaluated during the peak-period when the proposed project would have the greatest effect on the existing queue lengths. The analysis of the freeway on-ramps focused on queue lengths and wait times in the mixed-

flow lanes, since the queue and delay for vehicles in the high-occupancy vehicle (HOV) lanes are significantly shorter than in the mixed-flow lane.

Existing and Background Operations at Study Metered On-Ramps

The existing queue length and service rate of the meter at the study on-ramps were measured in the field during the AM and PM peak hours in March, April, and May 2018. The northbound/westbound study on-ramps are currently metered during the AM peak-hour while the southbound/eastbound study on-ramps are currently metered during the PM peak-hour, with the exception of the ramp meter at the US 101 southbound on-ramp at Bowers Avenue, which was not operating during either the AM and PM peak hours when field observations were conducted. Wait times (the time it took a vehicle at the end of the queue to proceed through the meter) at the metered ramp were derived from the collected data. Additionally, a ratio between the existing volumes using the freeway on-ramp and the approved and project trips was used to estimate the number of vehicles that would be added to the existing queue under background and project conditions.

Project traffic bound for southbound US 101 is anticipated to utilize the Great America Parkway/Bowers Avenue interchange, while project traffic bound for northbound US 101 is anticipated to utilize both the Lawrence Expressway and the Great America Parkway/Bowers Avenue interchanges.

The longest vehicle queues at the study freeway on-ramps were observed to be able to accommodate within each of the ramps, with the exception of the SR 237 eastbound on-ramp from northbound Great America Parkway, where the longest vehicle queue observed (approximately 110 vehicles during the PM peak-hour) extended onto the right-most through lane on northbound Great America Parkway. The northbound Great America Parkway to eastbound SR 237 vehicle queue was observed to extend to the intersection of Great America Parkway/Great America Way, approximately 500 feet beyond the SR 237 eastbound on-ramp. The wait times at this on-ramp were observed to be approximately 14 minutes and 40 seconds long.

Approved projects in the vicinity are estimated to all study freeway on-ramps, increasing the existing queue length and wait times at the ramps. In particular, more than 1,000 PM peak-hour trips are projected to be added to the SR 237 eastbound on-ramp, resulting in an estimated vehicle queue length of 250 vehicles and wait time of 33 minutes.

Project's Effect on Metered On-Ramps

The proposed project traffic is anticipated to add no more than 5 trips to any of the study metered on-ramps during the AM peak-hour, and approximately 22 and 31 trips to the SR 237 westbound and eastbound on-ramps, respectively, during the PM peak-hour.

Based on the above information and assumptions, it was determined that the following study freeway on-ramps would experience an increase in queue length and wait time as the result of the addition of project traffic:

- SR 237 Westbound On-ramp (AM peak-hour) – increase of one vehicle in the projected vehicle queue length (from 11 to 12 vehicles from background to project conditions) and increase of 5 seconds in the wait time (from 55 seconds to one minute from background to project conditions) at the meter. Project traffic added to this on-ramp represents an increase of less than 1% in the ramp volume. The estimated vehicle queue length within this metered on-ramp would store within the ramp.
- SR 237 Eastbound On-ramp (PM peak-hour) – increase of four vehicles in the projected vehicle queue length (from 250 to 254 vehicles from background to project conditions) and increase of 22 seconds in the wait time (from 33 minutes 20 seconds to 33 minutes 52 seconds from background to project conditions) at the meter. Project traffic added to this on-ramp represents an increase of approximately 1.6% in the ramp volume. The estimated vehicle queue length

within this metered on-ramp would spill out of the ramp and extend onto Great America Parkway.

It should be noted that it is not very likely that a wait time of 30+ minutes at the SR 237 Eastbound On-Ramp would ever be experienced. Most drivers tend to look for alternative routes or different times to travel when long delays at experienced at an intersection or freeway ramp. However, the analysis presents an evaluation to quantify the potential change in delay due to the proposed project.

Project traffic at the remaining study freeway on-ramps is not projected to be sufficient to cause an increase in the projected vehicular queue lengths nor the wait times at the ramps.

The freeway ramp analysis is summarized in Table 13. Calculation of the ramp queue lengths and wait time under background and project conditions are presented in Appendix F.

Freeway Off-Ramp Analysis

Queue lengths at the study freeway off-ramps were obtained from TRAFFIX. Each turn movement within the ramp was assessed to determine the worst movement queue, since that represents the queue that would dictate ramp operations. A combined queue length for all movements at the ramp was evaluated if individual movement queue lengths were projected to extend out of their dedicated turn-pockets. Storage within the ramp for free right-turning vehicle also was taken into account assuming the left-turn queue length potentially could extend and block the free right-turn lane.

The results of the off-ramp queue analysis are summarized below and presented in Table 14.

Existing and Background Off-Ramps Queue Lengths

The TRAFFIX level of service calculations shows that all study freeway off-ramps, with the exception of one off-ramp, provide adequate queue storage capacity to serve the existing 95th percentile queue lengths. The queue length at the US 101 southbound off-ramp at Lawrence Expressway currently exceeds the available queue storage capacity during the PM peak-hour by approximately 500 feet. The excess queue length spills onto the southbound US 101 mainline.

Field observations confirmed the projected queue lengths obtained from TRAFFIX, and the extension of the queue length from the US 101 southbound off-ramp at Lawrence Expressway to the freeway.

With the addition of traffic from approved projects in the vicinity, all study off-ramp vehicle queues are projected to increase. However, the projected queue lengths would continue to be accommodated within the existing ramps, with the exception of the US 101 southbound off-ramp at Lawrence Expressway, which is projected to continue to exceed the ramp's queue storage capacity.

Project's Effect on Off-Ramps Queue Lengths

The addition of project traffic to the analyzed freeway off-ramps is projected to increase ramp queue lengths by no more than one vehicle during the peak-hours. The queue length at the US 101 southbound off-ramp at Lawrence Expressway is projected to continue to exceed the ramp's queue storage capacity under project conditions. However, the project traffic would not increase the queue length at this off-ramp.

All other study freeway off-ramps would provide adequate queue storage capacity to serve the projected queue lengths within each ramp.

Table 13
Metered Freeway On-Ramp Analysis

Freeway Ramp	Peak Hour	Existing Conditions[1] Volume (veh)	Existing Conditions[1] Queue Length (total veh.)	Existing Conditions[1] Wait Time[3] (min:sec)	Background Conditions[2] Approved Trips	Background Conditions[2] Queue Length (total veh.)	Background Conditions[2] Wait Time[3] (min:sec)	Project Conditions[2] Project Trips	Project Conditions[2] Percent Increase[4]	Project Conditions[2] Queue Length (total veh.)	Project Conditions[2] Wait Time[3] (min:sec)
US 101 NB On-Ramp from NB Lawrence Expy	AM	316	20	02:00.0	149	30	03:00.0	5	1.1%	30	03:00.0
US 101 NB On-Ramp from NB Bowers Ave	AM	122	16	01:37.6	55	24	02:26.4	5	2.8%	24	02:26.4
SR 237 WB On-Ramp from NB Great America Pkwy	AM	556	6	00:30.0	462	11	00:55.0	4	0.4%	12	01:00.0
SR 237 WB On-Ramp from NB Great America Pkwy	PM	584	8	00:48.0	843	20	02:00.0	22	1.5%	20	02:00.0
SR 237 EB On-Ramp from NB Great America Pkwy	PM	836	110	14:40.0	1,063	250	33:20.0	31	1.6%	254	33:52.0

Notes:
[1] Existing queue length represents the total vehicles in the queue observed during the peak-hour period.
Existing wait times were estimated based on surveyed times at the ramps conducted in March ,April, and May 2018.
[2] Background and background plus project conditions queue lengths were estimated based on the ratio between the existing volumes on the ramp and the estimated approved and project trips added to the ramp.
[3] Future wait times were estimated based on the queue length and the measured meter's service rate.
[4] Percent increase was calculated from background to background plus project project conditions.

Table 14
Freeway Off-Ramp Analysis

Off-Ramp	Peak Hour	Movement by Project [1]	Analyzed (Worst) Movement	Existing Storage (feet per lane)	TRAFFIX 95th Percentile Queue Length (feet per lane) [2]		
					Existing	Background	Background Plus Project
US 101 NB Off-Ramp to SB Bowers Ave	AM	WBL[3]	WBL	700	200	550	650
	PM				275	625	650
US 101 SB Off-Ramp to SB Bowers Ave	AM	EBR[3]	EBL	1,025	425	775	775
	PM				200	350	350
US 101 SB Off-Ramp to SB Lawrence Expy	AM	EBR	EBL+R	975	700	725	775
	PM				**1,500**	**1,225**	**1,225**
SR 237 WB Off-Ramp to SB Great America Pkwy	AM	WBL	WBL	1,300	400	1,275	1,300
	PM				250	525	550
SR 237 EB Off-Ramp to SB Great America Pkwy	AM	EBR[3]	EBL	1,125	200	375	375
	PM				200	350	375

Note:
The reported 95th percentile queue is for movement with the longest queue on the off-ramps (worst movement), which could be a combination of all movements on the off-ramp.
[1] Movement to which the proposed project adds traffic to.
[2] Assumes 25 feet per vehicle.
[3] Free right-turn movement on this off-ramp, therefore, queue length for the right-turn movement is not available. However, if queue for the left-turn movement blocks the right-turn pockets, the right-turn movement volume also will affect the overall queue on the ramp. Therefore, queue storage for the left-turn movement on this ramp takes into account potential right-turning vehicles queued within the shared lane on the ramp.
Bold indicates queue length that exceeds the existing storage capacity.

Potential Impacts on Pedestrians, Bicycles, and Transit

Pedestrian Access

As discussed previously, Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the project vicinity, sidewalks are provided on both sides of Peterson Way and Tannery Way, as well as along the entire project site frontage on Lakeside Drive.

Project's Effect on Pedestrian Facilities

It can be expected that new pedestrian traffic would be generated by the proposed project. The project site is located within what would be considered a walking distance (less than half one mile) from various pedestrian destinations, including restaurants, shopping centers, and bus stops.

With the available sidewalks and crosswalks along roadways and intersections in the vicinity of the project site, adequate pedestrian access to and from the project site to nearby pedestrian destinations would be provided. Therefore, no off-site pedestrian improvements are necessary.

Bicycle Facilities

There are numerous bike lanes and bike paths in the vicinity of the project site, including the Class II bike lanes along Lakeside Drive, which serve the project site directly and provide connections to other bicycle facilities in the area.

Project's Effect on Bicycle Facilities

The proposed project could increase the demand on bicycle facilities in the vicinity of the project site. Assuming bicycle trips would comprise no more than one percent of the total project-generated trips, the project could generate 6-7 new bicycle trips during the peak hours. The potential demand could be easily served by the various bicycle facilities available in the immediate vicinity of the project site. Therefore, the potential increase in bicycle trips by the proposed project would not have an adverse effect on the existing bicycle facilities in the study area, and would not require new off-site bicycle facilities.

Transit Service

The project area is served by various bus lines that serve bus stops located within a half-mile walking distance from the project site.

Project's Effect on Transit Services

Due to the proximity of bus stops to the project site, it is assumed that some tenants of the proposed project would utilize the existing transit service. Assuming a commute hour transit mode share of 2 percent (as recommended by VTA guidelines), the project would generate up to 13 new transit riders during the peak hours. Given that the project site is served by 3 local bus routes, one limited-stop route, and one shuttle, an average of 3-4 new transit riders would access each of the available bus routes during the peak-hours. Therefore, it is anticipated that the projected transit riders associated with the project could be accommodated by the existing transit services.

An evaluation of the effects of project traffic on transit vehicle delay also was completed. The analysis was completed for all transit routes that travel through the study intersections utilizing information presented in the preceding chapter under the intersection Level of Service analysis. The results of the transit delay analysis is presented in Table 15. The analysis shows that for most routes, the traffic associated with the proposed project would increase delay to transit vehicles by 89 seconds (less than

Table 15
Transit Delay Analysis Summary

Route #	Study Area Street(s)	Direction	Projected Change in Transit Vehicle Delay (sec/veh) AM	PM
22/522	El Camino Real	EB	-0.1	0.0
		WB	0.3	0.1
32	Monroe Street	EB	0.1	0.0
		WB	0.0	0.1
55	Lawrence Expressway, Tasman Drive	NB	0.0	0.3
		SB	0.0	0.0
57	Bowers Avenue, Great America Parkway	NB	14.3	17.0
		SB	6.6	33.4
58	Bowers Avenue, Scott Boulevard, Central Expressway, Lafayette Street, and Montague Expressway	NB	4.5	11.5
		SB	6.5	13.8
60	Mission College Boulevard, Montague/San Tomas Expressway, Scott Boulevard and Monroe Street	NB	1.9	0.5
		SB	2.7	6.7
121	Great America Parkway	NB	1.1	[1]
		SB	[1]	5.0
140	Great America Parkway, Mission College Boulevard	NB	[1]	2.2
		SB	1.1	[1]
304	Arques Avenue, Scott Boulevard, Central Expressway, and De La Cruz Boulevard	NB	15.5	[1]
		SB	[1]	22.8
321	Great America Parkway, Mission College Boulevard and Montague Expressway	EB	[1]	89.0
		WB	3.1	[1]
328	Lawrence Expressway	NB	17.2	[1]
		SB	[1]	12.7
330	Great America Parkway, Mission College Boulevard and Montague/San Tomas Expressway	NB	12.9	[1]
		SB	[1]	14.4
822	Great America Parkway, Scott Boulevard, Arques Avenue, Kifer Road	NB	[1]	-4.3
		SB	8.4	[1]

Notes:
[1] No scheduled trips during peak hour
Projected increase in transit delay based on a comparison of background vs. background plus project conditions intersection movement delays calculated by TRAFFIX.

two minutes) or less per vehicle. The VTA has not established policies or significance criteria related to transit vehicle delay. Thus, this data is presented for informational purposes only.

8. Conclusions

The potential impacts of the project were evaluated in accordance with the standards set forth by the Cities of Santa Clara, Sunnyvale, and San Jose, as well as the Santa Clara Valley Transportation Authority (VTA) Congestion Management Program (CMP). The study included the analysis of AM and PM peak-hour traffic conditions at 40 intersections and 15 freeway segments (30 directional segments) in the vicinity of the project site. The study also includes an analysis of freeway ramps serving the project site as well as transit, bicycle, and pedestrian access.

Background Plus Project Intersection Level of Service Analysis

The results of the level of service analysis show that seven intersections located within the City of Santa and one intersection located within the City of Sunnyvale would be significantly impacted by the project, according to applicable impact criteria. The proposed improvements to mitigate the project impacts are described below.

Project Impacts

(7) Great America Parkway and Great America Way (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). Improvements to mitigate project impacts at this intersection have been identified by City Place and are included under background and cumulative conditions. The City Place EIR has identified the above improvements as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

Other possible improvements to mitigate the project impact at this location include the addition of a second northbound left-turn lane. With implementation of this improvement, the intersection level of service is projected to improve to LOS E during the AM peak-hour, reducing the project impact to *less than significant*; however, the intersection would continue to operate unacceptably during the AM peak-hour. However, the widening of Great America Parkway and the west leg of the intersection is not feasible. Therefore, this improvement is not feasible due to right-of-way constraints.

The necessary improvement to improve the intersection's operating conditions to acceptable levels consists of the addition of a fourth southbound through lane. This improvement, however, is not feasible due to right-of-way constraints. Therefore, this project impact would be considered ***significant and unavoidable***.

(8) Great America Parkway and Old Mountain View-Alviso Road (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). Improvements to mitigate project impacts at this intersection have been identified by City Place and are included under background and cumulative conditions. The City Place EIR has identified the above improvements as partial mitigation to their impact at this location, however, their impact was identified to remain significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate southbound right-turn lane. The southbound approach at this location currently consists of one left-turn lane, three through lanes, and an 8-foot wide bike lane/right-turn lane. Implementation of the separate southbound right-turn lane improvement would require the widening of the west side of Great America Parkway (north of Old Mountain View/Alviso Road) by approximately 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane) for a distance of approximately 150 feet. The widening of the west side of Great America Parkway would require partial removal of landscape and the relocation of two traffic signal/utilities cabinets, a light pole, and a traffic signal pole. With implementation of the above improvement, the intersection level of service is projected to improve to an acceptable LOS C during the AM peak-hour, reducing the project impact to ***less than significant***.

(16) Bowers Avenue and Augustine Drive (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). However, the City Place EIR identified no feasible mitigations due to right-of-way restrictions and has determined their impact at this location to be significant and unavoidable.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a fourth southbound through lane. This improvement, however, would require the widening of Bowers Avenue which is not be feasible due to right-of-way constraints. Therefore, the project impact to this intersection is considered ***significant and unavoidable***.

(17) Bowers Avenue and Scott Boulevard (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second southbound left-turn lane at this intersection as mitigation to their project impact. This improvement would require reducing the outside lane width (which includes a bike lane) to 16 feet, reducing the width of the inner two southbound through lanes from 12 feet to 11 feet, and partial removal of the raised center median to provide a second 10-12-foot left-turn lane.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a separate northbound right-turn lane, in addition to the second southbound left-turn lane. Implementation of the separate northbound right-turn lane would require the widening of the east side of Bowers Avenue (south of Scott Boulevard) by a minimum of 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane). The widening of the east side of Bowers Avenue would require right-of-way acquisition and partial removal of landscape and two trees along the east side of Bowers Avenue to accommodate a 5-foot sidewalk on this side of the street, in addition to the separate northbound right-turn lane.

Therefore, the required mitigation of the identified project impact at the intersection will consist of implementation of a separate northbound right-turn lane and a fair-share contribution towards the planned second southbound left-turn lane. With implementation of these improvements, the intersection

level of service is projected to improve to acceptable LOS E during both the AM and PM peak hours, reducing the project impact to ***less than significant***.

(21) San Tomas Expressway and Scott Boulevard (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a Tier 1C and a Tier 2 priority improvement (identified below) as mitigation to their project impact.

The addition of a second westbound right-turn lane at this intersection has been identified as a Tier 1C priority improvement in the Comprehensive County Expressway Planning Study 2008 Update, March 2009, and is included in the City of Santa Clara Traffic Mitigation Program, June 2011. With implementation of this improvement, however, the intersection is projected to continue to operate deficiently during the PM peak-hour and the project impact would continue to be significant. Additionally, an interchange has been identified at this intersection as a Tier 2 priority improvement in the Comprehensive County Expressway Planning Study.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards the above short-term (second westbound right-turn lane) and long-term (interchange) improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

(23) San Tomas Expressway and Monroe Street (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a Tier 3 priority improvement (identified below) as mitigation to their project impact.

The addition of a second northbound left-turn lane at this intersection has been identified as a Tier 3 priority improvement in the Comprehensive County Expressway Planning Study Policy Advisory Board 2015 Update, March 23, 2015. Implementation of the above improvement, however, is not projected to improve intersection operating conditions with the project and the project impact would continue to be significant.

The necessary improvement to mitigate the project impact at this intersection consists of the addition of a fourth southbound through lane. This improvement, however, would require the widening of San Tomas Expressway, which is not be feasible due to right-of-way constraints, or converting the existing HOV lane to a mixed-flow lane.

Additionally, this intersection is one of seven CMP intersections identified in the Santa Clara Multimodal Improvement Plan. The Multimodal Improvement Plan has determined that localized mitigation for the identified seven CMP facilities is not feasible or would be undesirable in light of other city goals and policies and identifies a set of actions and programs that can be implemented to improve system-wide transportation conditions and air quality in the City of Santa Clara.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards planned improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

(28) Lakeside Drive and Augustine Drive (City of Santa Clara)

Mitigation Measure. The significant impact at this intersection could be satisfactorily mitigated with the modification of the eastbound/westbound approaches of the intersection to include one shared left-and-through and one right-turn lane in the westbound approach and one share left-and-through and one shared right-and-through lane in the eastbound approach. These improvements also would require changing the signal phasing from protected to split phasing in the eastbound/westbound direction. Implementation of the above improvements would improve the intersection's operating conditions to LOS C and D during the AM and PM peak hours, respectively, under background plus project conditions, reducing the project impact to ***less than significant***.

(38) Oakmead Parkway/Corvin Drive and Central Expressway (CMP Intersection)

Mitigation Measure. The significant impact at this intersection could be satisfactorily mitigated with the addition of a second eastbound left-turn lane. Implementation of the above improvements would improve the intersection's operating conditions to LOS E during both peak hours, reducing the project impact to less than significant.

Therefore, mitigation of the identified project impact at the intersection will consist of a fair-share contribution towards the above improvements. However, since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the project impact at this intersection is determined to be ***significant and unavoidable***.

Cumulative Plus Project Intersection Level of Service Analysis

The results of the level of service analysis show that nine intersections located within the City of Santa and one intersection located within the City of Sunnyvale would be significantly impacted by the project under cumulative conditions, according to applicable impact criteria. The proposed improvements to mitigate the project impacts are described below.

Cumulative Project Impacts

(7) Great America Parkway and Great America Way (City of Santa Clara)

The necessary improvement to improve the intersection's operating conditions to acceptable levels consists of the addition of a fourth southbound through lane. This improvement, however, is not feasible due to right-of-way constraints. Therefore, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

(8) Great America Parkway and Old Mountain View-Alviso Road (City of Santa Clara)

Mitigation Measure. Same as described under background plus project conditions.

(16) Bowers Avenue and Augustine Drive (City of Santa Clara)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). However, the City Place EIR identified no feasible mitigations due to right-of-way restrictions and has determined their impact at this location to be significant and unavoidable.

The necessary improvements to improve the intersection's operating conditions to acceptable levels consists of the widening of Bowers Avenue to include four through lanes (with a separate right-turn lane in the southbound direction) in each the northbound and southbound directions. Implementation of these improvements is not feasible due to right-of-way constraints. Therefore, the cumulative project impact at this intersection is considered to be ***significant and unavoidable***.

(17) Bowers Avenue and Scott Boulevard (CMP Intersection)

Mitigation Measure. This intersection has previously been identified to operate deficiently with the addition of traffic associated with an approved development (City Place). The City Place EIR has identified a fair-share contribution towards the implementation of a second southbound left-turn lane at this intersection as mitigation to their project impact.

Possible improvements at this location include the addition of a separate northbound right-turn lane, in addition to the second southbound left-turn lane. Implementation of the separate northbound right-turn lane would require the widening of the east side of Bowers Avenue (south of Scott Boulevard) by a minimum of 8 feet (to provide one 6-foot bike lane and one 10-foot right-turn lane). The widening of the east side of Bowers Avenue would require right-of-way acquisition and partial removal of landscape and two trees along the east side of Bowers Avenue to accommodate a 5-foot sidewalk on this side of the street, in addition to the separate northbound right-turn lane. With implementation of the above improvements (both the southbound left-turn lane and the northbound right-turn lane), the intersection delays is projected to improve to better than no project conditions, reducing the cumulative project impact to less than significant; however, the intersection would continue to operate unacceptably (LOS F).

In order to improve the intersection's operating conditions to acceptable levels, in addition to the above improvements, the addition of a fourth northbound through lane and a separate southbound right-turn lane would be necessary. With these improvements, the intersection level of service is projected to improve to acceptable LOS E during the AM peak-hour. These improvements, however, would require the widening of Bowers Avenue which is not be feasible due to right-of-way constraints. Therefore, the cumulative project impact to this intersection is considered ***significant and unavoidable***.

(21) San Tomas Expressway and Scott Boulevard (CMP Intersection)

Mitigation Measure. Same as described under background plus project conditions.

(28) Lakeside Drive and Augustine Drive (City of Santa Clara)

Mitigation Measure. Same as described under background plus project conditions.

(38) Oakmead Parkway/Corvin Drive and Central Expressway (CMP Intersection)

Mitigation Measure. The cumulative project impact at this intersection could be satisfactorily mitigated with the addition of a second eastbound left-turn lane. Implementation of the above improvements would improve the intersection's operating conditions to better than cumulative no project conditions, reducing the project impact to less than significant; however, the intersection would continue to operate at unacceptable LOS F during both peak hours.

The necessary improvements to improve the intersection's operating conditions to acceptable levels consist of the widening of Central Expressway to include three through lanes in each direction. The Central Expressway widening to three lanes in each direction from San Tomas Expressway to Lawrence Expressway is included as a Tier 3 improvement identified in the March 2015 update to the 2008 Countywide Expressway Study. Therefore, mitigation of the identified cumulative project impact at the intersection will consist of a fair-share contribution towards the above improvements.

Since this intersection is located outside of City of Santa Clara jurisdiction, and the city of Santa Clara cannot guarantee the implementation of the improvements concurrently with the proposed project, the cumulative project impact at this intersection is determined to be ***significant and unavoidable***.

Freeway Segment Capacity Analysis

The results of the CMP freeway segment analysis show that the proposed project is projected to add traffic volumes representing 1% or more of the freeway capacity to the mixed-flow lanes on 11 directional freeway segments and to the HOV lanes on 7 directional freeway segment that currently operate at LOS F. Based on CMP freeway impact criteria, the following directional freeway segment (mixed-flow and/or HOV lanes) would be impacted by the proposed project.

1. Northbound US 101, from I-880 to Old Bayshore Highway
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
2. Northbound US 101, from Old Bayshore Highway to North First Street
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
3. Northbound US 101, from North First Street to Guadalupe Parkway (SR 87)
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
4. Northbound US 101, from Guadalupe Parkway (SR 87) to De La Cruz Boulevard
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
5. Northbound US 101, from De La Cruz Boulevard to San Tomas/Montague Expressway
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
6. Northbound US 101, from San Tomas/Montague Expwy to Bowers Ave/Great America Pkwy
   (**Impact:** AM peak-hour – Mixed-flow and HOV lanes)
20. Southbound US 101, from Bowers Ave/Great America Pkwy to San Tomas/Montague Expwy
    (**Impact:** PM peak-hour – Mixed-flow and HOV lanes)
21. Southbound US 101, from San Tomas/Montague Expressway to De La Cruz Boulevard
    (**Impact:** PM peak-hour – Mixed-flow lanes)
23. Southbound US 101, from Guadalupe Parkway (SR 87) to North First Street
    (**Impact:** PM peak-hour – Mixed-flow lanes)
24. Southbound US 101, from North First Street to Old Bayshore Highway
    (**Impact:** PM peak-hour – Mixed-flow lanes)
25. Southbound US 101, from Old Bayshore Highway to I-880
    (**Impact:** PM peak-hour – Mixed-flow lanes)

Full mitigation of significant project impacts on freeway segments would require roadway freeway widening to construct additional through lanes, thereby increasing freeway capacity. The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along US 101, between Whipple Avenue in San Mateo County and Cochrane Road in Morgan Hill (VTP ID: H2), which includes the impacted freeway segments. The express lane projects on US 101 consist of the conversion of approximately 34 miles of existing High Occupancy Vehicle (HOV or carpool) lanes to express lanes and adding a second express lane for a total of two express lanes in each direction. However, converting the HOV lanes to express lanes would not mitigate the project impacts. Therefore, the significant impacts on the directional freeway segments identified above must be considered significant and unavoidable.

Both VTA and Caltrans have encouraged local agencies to collect "voluntary contributions" to be used toward improvement of the regional freeway system. Therefore, the project may be required to make a fair-share contribution toward the cost of the US 101 express lane project. The amount of the contribution, if required, would be negotiated with the City of Santa Clara.

Unsignalized Intersection Analysis (Traffic Signal Warrants)

The results of the peak-hour traffic signal warrant checks indicate that both of the unsignalized study intersections are projected to have traffic volumes that fall below the thresholds that warrant signalization under background plus project and cumulative plus project conditions.

Other Transportation Issues

Site Access Evaluation

Vehicular access to the project site would be provided via two driveways along Peterson Way, two driveways along Tannery Way, and one driveway along Lakeside Drive. All project driveways would provide full access to/from the project site.

The proposed driveways would satisfy City of Santa Clara driveway design standards.

Sight Distance at the Driveways

Adequate sight distance would be provided at the project site driveways on Peterson Way and Tannery Way.

Driveway 5 is located along a curving segment of Lakeside Drive, which results in limited sight distance. Nevertheless, aerial images and field observations show that the required stopping sight distance of 250 feet is currently provided at this driveway, as long as on-street parking along the southside of Lakeside Drive is prohibited for a minimum of 250 feet to the north/west and 100 feet to the south/east (between Driveway 5 and the adjacent driveways).

Based on the posted speed limits, Caltrans design standards, and the above recommendations, adequate stopping sight distance is and would continue to be provided at all project site driveways.

Emergency Vehicle Access

Based on the driveway widths and proposed fire access plan, emergency vehicle access and circulation throughout the site would be adequate.

Pedestrian Access

Pedestrian access to all proposed facilities within the project site would be adequate.

On-Site Circulation

Based on the proposed circular layout of the project site, connectivity between all parking areas and parking structure, adequate drive aisle widths and turn radii, on-site vehicular circulation would be adequate.

Pedestrian On-Site Circulation

Based on the site plan layout and proposed pedestrian facilities, pedestrian access to all proposed facilities within the project site would be adequate.

Recommended Site Access and Circulation Improvements

The following recommendations are made to promote adequate site access and on-site circulation:

Prohibit On-Street Parking Adjacent to Project Driveways. On-street parking must continue to be prohibited adjacent to the project site driveway along Lakeside Drive (Driveway 5) in order to provide the required minimum stopping sight distance of 250 feet at this driveway. Additionally, Hexagon recommends that standard no parking zones be established adjacent to the project driveways on Peterson and Tannery Ways to ensure that exiting vehicles can see pedestrians on the sidewalk, as well as vehicles on the road.

Provide Clear Sight Triangles at Driveways. The project must ensure that any landscaping and signage located adjacent to the project driveways do not obstruct the view for drivers exiting the site.

Design of Project Site. The design of the project site, including but not limited to driveways, sidewalks, drive aisles, turn radii, parking stalls, and signage should adhere to City of Santa Clara design standards.

Parking

Vehicle Parking

The site plan lists a total of 2,280 on-site parking spaces being proposed, which is 19 spaces less than the calculated number of spaces above.

Americans With Disabilities Act Compliance

The proposed number of accessible parking spaces satisfies ADA parking requirements.

Bicycle Parking

The proposed number of bicycle parking spaces exceeds the required number of both short-term and long-term parking spaces.

Queuing Analysis

The results of the queuing analysis show that there is inadequate queue storage capacity for seven of the twelve left-turn movements analyzed (six intersections). Intersections projected to have left-turn queue storage deficiencies include:

5. Garrett Drive and Scott Boulevard
16. Bowers Avenue and Augustine Drive
18. Bowers Avenue and Central Expressway
21. San Tomas Expressway and Scott Boulevard
33. Lawrence Expressway and Oakmead Parkway
37. Oakmead Parkway and Arques Avenue/Scott Boulevard

Freeway Ramp Analysis

Metered Freeway On-Ramp Analysis

It was determined that the following study freeway on-ramps would experience an increase in queue length and wait time as the result of the addition of project traffic:

- SR 237 Westbound On-ramp (AM peak-hour) – increase of one vehicle in the projected vehicle queue length (from 11 to 12 vehicles from background to project conditions) and increase of 5 seconds in the wait time (from 55 seconds to one minute from background to project conditions) at the meter. Project traffic added to this on-ramp represents an increase of less than 1% in the ramp volume. The estimated vehicle queue length within this metered on-ramp would store within the ramp.
- SR 237 Eastbound On-ramp (PM peak-hour) – increase of four vehicles in the projected vehicle queue length (from 250 to 254 vehicles from background to project conditions) and increase of 22 seconds in the wait time (from 33 minutes 20 seconds to 33 minutes 52 seconds from background to project conditions) at the meter. Project traffic added to this on-ramp represents an increase of approximately 1.6% in the ramp volume. The estimated vehicle queue length within this metered on-ramp would spill out of the ramp and extend onto Great America Parkway.

It should be noted that it is not very likely that a wait time of 30+ minutes at the SR 237 Eastbound On-Ramp would ever be experienced. Most drivers tend to look for alternative routes or different times to

travel when long delays at experienced at an intersection or freeway ramp. However, the analysis presents an evaluation to quantify the potential change in delay due to the proposed project.

Project traffic at the remaining study freeway on-ramps is not projected to be sufficient to cause an increase in the projected vehicular queue lengths nor the wait times at the ramps.

Freeway Off-Ramp Analysis

The addition of project traffic to the analyzed freeway off-ramps is projected to increase ramp queue lengths by no more than one vehicle during the peak-hours. The queue length at the US 101 southbound off-ramp at Lawrence Expressway is projected to continue to exceed the ramp's queue storage capacity under project conditions. However, the project traffic would not increase the queue length at this off-ramp.

All other study freeway off-ramps would provide adequate queue storage capacity to serve the projected queue lengths within each ramp.

Potential Impacts on Pedestrians, Bicycles, and Transit

Project's Effect on Pedestrian Facilities

It can be expected that new pedestrian traffic would be generated by the proposed project. The project site is located within what would be considered a walking distance (less than half one mile) from various pedestrian destinations, including restaurants, shopping centers, and bus stops.

With the available sidewalks and crosswalks along roadways and intersections in the vicinity of the project site, adequate pedestrian access to and from the project site to nearby pedestrian destinations would be provided. Therefore, no off-site pedestrian improvements are necessary.

Project's Effect on Bicycle Facilities

The proposed project could increase the demand on bicycle facilities in the vicinity of the project site. Assuming bicycle trips would comprise no more than one percent of the total project-generated trips, the project could generate 6-7 new bicycle trips during the peak hours. The potential demand could be easily served by the various bicycle facilities available in the immediate vicinity of the project site. Therefore, the potential increase in bicycle trips by the proposed project would not have an adverse effect on the existing bicycle facilities in the study area, and would not require new off-site bicycle facilities.

Project's Effect on Transit Services

Due to the proximity of bus stops to the project site, it is assumed that some tenants of the proposed project would utilize the existing transit service. Assuming a commute hour transit mode share of 2 percent (as recommended by VTA guidelines), the project would generate up to 13 new transit riders during the peak hours. Given that the project site is served by 3 local bus routes, one limited-stop route, and one shuttle, an average of 3-4 new transit riders would access each of the available bus routes during the peak-hours. Therefore, it is anticipated that the projected transit riders associated with the project could be accommodated by the existing transit services.

An evaluation of the effects of project traffic on transit vehicle delay also was completed. The analysis was completed for all transit routes that travel through the study intersections utilizing information presented in the preceding chapter under the intersection Level of Service analysis. The results of the transit delay analysis shows that for most routes, the traffic associated with the proposed project would increase delay to transit vehicles by 89 seconds (less than two minutes) or less per vehicle. The VTA has not established policies or significance criteria related to transit vehicle delay. Thus, this data is presented for informational purposes only.