CITY OF SUNNYVALE Land Use and Transportation Element

DRAFT ENVIRONMENTAL IMPACT REPORT - APPENDICES

SCH No. 2012032003

Prepared for:

CITY OF SUNNYVALE 456 W. OLIVE AVE. SUNNYVALE, CA 94086

Prepared by:



2729 PROSPECT PARK DRIVE, SUITE 220 RANCHO CORDOVA, CA 95670

AUGUST 2016

APPENDICES

APPENDIX A - NOP AND COMMENTS

A list of comments received, issues identified and where they are addressed in the Draft EIR is provided in **Table A-1**.

Commenter	Date	Summary of Comments	Where Addressed in Draft EIR
Bay Conservation and Development Commission (BCDC)	June 26, 2015	 Draft EIR should consider BCDC policies and impacts on biological resources if projects are within BCDC jurisdiction. The LUTE should consider the transportation policies of the Bay Plan. Draft EIR should consider Bay Plan policies relative to sea level rise. 	Section 3.1, Land Use, and Section 3.9, Biological Resources, evaluate impacts related to BCDC jurisdiction and biological resources, respectively. Section 3.13, Greenhouse Gases and Climate Change Adaptation, addresses sea level rise. The LUTE will be implemented in conjunction with the Climate Action Plan (CAP).
Caltrans District 4	June 24, 2015	 Draft EIR should evaluate travel demand from the project using Caltrans <i>Guide for the Preparation of Traffic Impact Studies,</i> including analysis of multi-modal travel demand and vehicle miles traveled (VMT) reductions that could be achieved through travel demand management (TDM) measures. The traffic impact analysis should describe existing conditions and project features. Project-related trip generation, distribution, per capita use of existing and new transit, and VMT reduction factors should be described along with assumptions and methodologies. Analysis should evaluate 2035 cumulative conditions. The traffic study should evaluate consistency with the General Plan Circulation Element and Congestion Management Plan (CMP). Schematics of walking, biking, and auto conditions and study area roadways, trip distribution percentages and volumes, intersection geometrics should be provided. Potential safety issues for all road users should be identified and mitigated. 	A traffic impact analysis was prepared for the project, and the results are presented in Section 3.4, Transportation and Circulation. The complete TIA is included in Appendix

Governor's Office of Planning and Research, State Clearinghouse Santa Clara County Civil Grand Jury		intersection with increasing VMT should be identified and mitigated.	
Valley Transportation Authority (VTA)	June 22, 2015	 Transportation Impact Analysis (TIA) should follow October 2014 VTA guidelines, which includes procedures for documenting auto trip reductions, analyzing non-auto modes, and evaluating mitigation measures and improvements to address project impacts. TIA should use multimodal approach in the TIA, with performance indicators for VMT, non-auto mode shares, transit boardings,air quality emissions, levels of service (LOS), and pedestrian, bicycle, and transit facilities TIA should evaluate CMP facilities, including freeway segments and intersections. City's assumptions for transportation network and land use assumptions should be clearly stated, with consideration of Valley Transportation Plan (VTP) 2040 list and ABAG Projections 2013 assumptions. City should refer to the VTA CMP Local Transportation Model Consistency Guidelines. Draft EIR should evaluate impacts on bus travel times, particularly in the El Camino Real corridor, associated with increased traffic and congestion. 	A TIA was prepared for the project, and the results are presented in Section 3.4, Transportation and Circulation. The complete TIA is included in Appendix Section 2.0, Project Description, and Section 3.1, Land Use, describe land use assumptions.

PLANNING DIVISION CITY OF SUNNYVALE P.O. BOX 3707 SUNNYVALE, CA 94088-3707

REISSUED NOTICE OF PREPARATION

TO: Responsible, Trustee, and Other Interested Public Agencies FROM: City of Sunnyvale Community Development Department 456 West Olive Avenue P.O. Box 3707 Sunnyvale, CA 94088-3707

SUBJECT: Reissued Notice of Preparation of a Draft Environmental Impact Report

The City of Sunnyvale will be the lead agency and will prepare an environmental impact report (EIR) for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by the City when considering your permit or other approval for the project. The project description, location, and the probable environmental effects are contained in the attached materials.

Due to the time limits mandated by state law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. Please send your response to Trudi Ryan at the address shown above. We will need the name of a contact person in your agency.

A scoping meeting will be held on Thursday, June 17, 2015, at 7:00 p.m. in the City Council Chambers at Sunnyvale City Hall, located at 456 West Olive Avenue in Sunnyvale.

Project Title:	Sunnyvale Land Use and Transportation Element (LUTE) Update
	(SCH #2012032003)

Project Applicant: City of Sunnyvale, Trudi Ryan, (408) 730-7435

Project Description:

The draft LUTE update establishes the fundamental framework of how the City will be laid out (streets and buildings) and how various land uses, developments, and transportation facilities will function together. The draft LUTE update includes a series of land use and transportation policies, action statements, and strategies that provide direction for how much the City will change and grow between now and 2035, and where the growth will take place.

This is a reissued Notice of Preparation (NOP). A previous NOP dated March 2, 2012, was completed for this project, and a scoping meeting was held on March 22, 2012, under the project title Sunnyvale Land Use and Transportation Element (LUTE) Update and Climate Action Plan (SCH #2012032003). Since that time, the scope of the proposed project has changed. Specifically, the Climate Action Plan (CAP) was

separated from the proposed project and presented to the City Council for adoption independently from the draft LUTE update. An Initial Study/Negative Declaration (IS/ND) was prepared for the CAP, and the IS/ND and the CAP were adopted on May 20, 2014. This reissued NOP removes the CAP from the proposed project, incorporates numerous changes to the draft LUTE update since initial public release in 2012, and establishes a new baseline for environmental and regulatory setting discussions in the forthcoming EIR.

Date: May 22, 2015

Signature: an Trudi Ryan

Title: Planning Officer Telephone: (408) 730-7435 E-Mail: TRyan@sunnyvale.ca.gov

INTRODUCTION

The purpose of an EIR is to inform decision-makers and the general public of the environmental effects of a proposed project. The EIR process is intended to provide public agencies with the environmental information required to evaluate a proposed project, establish methods for reducing adverse environmental impacts, and consider alternatives to a project prior to the approval of the project.

The EIR for the City of Sunnyvale LUTE update will be prepared and processed in accordance with the California Environmental Quality Act (CEQA). In accordance with the requirements of CEQA, the EIR will analyze adoption and implementation of the draft LUTE update (proposed project) and include:

- An executive summary;
- A project description;
- A description of the existing environmental setting, potential environmental impacts, and mitigation measures;
- Alternatives to the proposed project; and
- Environmental consequences, including (1) any significant environmental effects which cannot be avoided if the proposed project is implemented, (2) the growth-inducing impacts of the proposed project, (3) effects found not to be significant, and (4) cumulative impacts.

1.0 PROJECT LOCATION

Sunnyvale is located in the flatlands of the northwest Santa Clara Valley, generally between Calabazas Creek on the east and Stevens Creek on the west, and between the San Francisco Bay on the north and Homestead Road on the south (see **Figure 1**). The "planning area" for the LUTE of the General Plan encompasses all areas within the City limits, and adopted sphere of influence. The planning area encompasses about 24 square miles and is almost entirely surrounded by the cities of Los Altos, Mountain View, Cupertino, and Santa Clara (see **Figure 2**).

2.0 DESCRIPTION OF THE PROJECT

The LUTE is a part of the City of Sunnyvale General Plan. The LUTE establishes the fundamental framework describing how the City will be laid out (streets and buildings) and how various land uses, developments, and transportation facilities will function together. The LUTE update includes a series of land use and transportation policies, action statements, and strategies that provide direction for how much the City will change and grow, and where the growth will take place.

The LUTE update has been developed to help guide the City's land use and transportation decisions for an approximate 20-year horizon—a time frame referred to as Horizon 2035. This growth scenario includes additional mixed-use residential/commercial growth in key transit-oriented areas and in transformed village centers. Areas for additional business (or industrial) growth are also identified. See **Figure 3** for the proposed land uses. **Table 1** identifies the 2035 build-out scenario (Horizon 2035) and potential changes from existing conditions.

			Change (2014–2035)	
Land Use Characteristics	2014	2035	Number	Percentage
Population	147,055	174,600	27,545	18.7%
Housing Units	57,000	72,180	15,180	26.6%
Industrial/Office/Commercial (million square feet)	47.3	59.6	12.3	26.0%
Jobs	82,000	124,000	42,000	51.0%
Jobs to Housing Units Ratio	1.44	1.72	0.28	19.0%

Table 1 Proposed LUTE Update Land Use Characteristics (2014–2035)

Source: City of Sunnyvale 2015

In general, the transportation policies guide how the roadways and streets will function and how space on the roadways will be utilized by multiple modes of transportation, with attention to the pedestrian and bicycle network. The draft LUTE update identifies roadways in the planning area by type and function, as identified in **Figure 4**. Policies in the land use and transportation sections address preserving community qualities that are favorable to the residents and businesses and which contribute to the planning area's unique identity. Policies also provide guidance on the visual quality and character of new development.

Project Objectives

The objectives of the proposed project are:

- 1. **Complete Community.** A place to live that is less dependent on automobiles, and reduces environmental impacts, with distinctive activity centers and neighborhoods with character and access to nearby services.
- 2. **Regional Planning Coordination.** The City coordinates regional and local planning efforts with other agencies and organizations to ensure Sunnyvale's competitive edge in the regional economy.
- 3. **Neighborhood and Transit-oriented Place-making.** Develop mixed-used areas that incorporate commercial, public, and residential uses that are compatible with the surrounding neighborhoods, create dynamic gathering spaces, establish unique visual character, provide nearby services, and reduce reliance on automobiles.
- 4. **Economic Development**. The City fosters an economic development environment which provides a wide variety of businesses and promotes a strong economy that can resist downturns within existing environmental, social, fiscal, and land use constraints.
- 5. **Environmental Sustainability.** Provide environmental leadership through land use patterns, renewable energy opportunities, and a multimodal transportation system.
- 6. **Multimodal Transportation.** Offer the community a variety of options for travel in and around the City that are connected to regional transportation systems and destinations.
- 7. **Healthy Living.** Maximize healthy living choices by providing easy access to fresh and healthy food, a range of recreation and open space options for community members of all ages, and convenient and safe biking and walking options throughout the community.

- 8. **Attractive Design.** Protect the design and feel of buildings and spaces to ensure an attractive community for residents and businesses.
- 9. **Diverse Housing.** Provide residential options for all incomes and lifestyles, including a variety of dwelling types, sizes, and densities that contribute positively to the surrounding area and the diversity of the community.
- 10. **Special and Unique Land Uses.** Allow for land uses such as child care, nursing homes, places of worship, etc. that complete the community fabric.
- 11. **Neighborhood Preservation.** Ensure that all residential areas and business districts in the planning area retain desired character and are enhanced through urban design and compatible mixes of activities.

4.0 POTENTIAL ENVIRONMENTAL EFFECTS OF THE PROJECT

The EIR will analyze the environmental impacts of adopting and implementing the proposed LUTE update. As no prime farmland, land zoned for agricultural use, timberland, or mineral resource zone is located in the planning area, the proposed project would have no impacts on agricultural resources, forestry resources, or mineral resources.

The EIR will address the following environmental issues: land use, population/housing/employment, hazards and hazardous materials, transportation, air quality, noise, geology and soils, hydrology and water quality, biological resources, cultural resources, utilities and public services, visual and aesthetic resources, energy use, greenhouse gas emissions, cumulative impacts, and growth-inducing impacts. A brief discussion of the anticipated environmental impacts is presented below.

Land Use: The EIR will address the issue of consistency and compatibility of the proposed land use and transportation changes and policies resulting from the proposed project in relation to physical effects on the environment.

Population/Housing/Employment: The EIR will analyze the potential changes in population, housing, and employment in the planning area resulting from the proposed project and whether those changes would result in physical effects on the environment (e.g., division of an established community).

Hazards and Hazardous Materials: The EIR will describe the existing conditions in the planning area, including the potential for existing soil and groundwater contamination to impact future uses. Any existing or potential hazards or hazardous waste generators in the planning area will be discussed and any federal, state, or local legislation concerning hazards and hazardous material use, handling, or transport will be identified.

Transportation: Continued growth, both in Sunnyvale and in surrounding communities, could increase vehicle miles traveled and the amount of traffic congestion experienced in the planning area. A traffic analysis will be conducted and its results analyzed in the EIR. The traffic analysis will evaluate existing and long-term impacts of the proposed project on roadway systems in the planning area and in adjacent jurisdictions.

Air Quality: The EIR will describe the regional air quality conditions in the San Francisco Bay Area and will address air quality impacts expected to result from the proposed project in conformance with criteria identified by the Bay Area Air Quality Management District. Impacts from construction-related activities,

as well as operational air quality impacts, toxic air contaminant exposure, and consistency with air quality improvement plans, will be addressed.

Noise: The EIR will discuss the existing noise setting and will evaluate the stationary and traffic-related noise impacts associated with the proposed project.

Geology and Soils: The EIR will describe the geologic and seismic setting of the planning area, and will address impacts associated with the proposed project.

Hydrology and Water Quality: The EIR will analyze issues concerning hydrology and water quality, including the existing storm drain system serving the planning area, the water providers for the planning area, future availability of water, flood hazards, and groundwater quality. Water quality impacts and conformance with the Santa Clara Valley Urban Runoff Pollution Prevention Program, other Regional Water Quality Control Board requirements, and the Water Resources Sub-Element of the Sunnyvale General Plan will also be addressed.

Biological Resources: The EIR will evaluate biological resource conditions in the planning area and potential impacts of the proposed project. The EIR will address the presence/absence of special-status plant and animal species and sensitive habitats in Sunnyvale.

Cultural Resources: The EIR will describe archeological, tribal, and historic resources in the planning area and the potential for the proposed project to affect the integrity of those resources.

Utilities and Public Services: The EIR will describe the existing utilities and public services serving the planning area and will analyze the impacts of the proposed project on utilities and public services, including sanitary sewer, storm drains, water supply, and solid waste.

Visual and Aesthetic Resources: The EIR will examine the potential impacts of the proposed project on the visual character and quality of the planning area related to urban form, building design, commercial signage, and other factors.

Energy Use: The EIR will examine the potential for excessive or inefficient use of energy resulting from the proposed project and will discuss the energy conservation measures proposed within the project.

Greenhouse Gas Emissions: The EIR will analyze the potential for the proposed project to generate cumulatively considerable greenhouse gas emissions and will describe how the proposed project is consistent with the City's adopted CAP.

Cumulative Impacts: The EIR will address the potentially significant cumulative impacts of the proposed project related to Association of Bay Area Governments population and jobs forecasts and reasonably foreseeable future projects in the region.

Growth-Inducing Impacts: The EIR will discuss the ways in which the proposed project could foster growth in the surrounding environment and the types of growth that could result.







Proposed Land Use Diagram



Proposed Transportation Diagram

PLANNING DIVISION CITY OF SUNNYVALE P.O. BOX 3707 SUNNYVALE, CA 94088-3707

CORRECTION: REISSUED NOTICE OF PREPARATION

TO: Responsible, Trustee, and Other Interested Public Agencies FROM: City of Sunnyvale Community Development Department 456 West Olive Avenue P.O. Box 3707 Sunnyvale, CA 94088-3707

SUBJECT: CORRECTION Reissued Notice of Preparation of a Draft Environmental Impact Report Scoping Meeting

A Notice of Preparation for the Sunnyvale Land Use and Transportation Element (LUTE) Update sent to you on May 22, 2015 provided an incorrect day for the scoping meeting. The correct information is listed below. The project description, location, and the probable environmental effects are unchanged. We apologize for any confusion the prior notice may have caused.

Scoping Meeting:	Wednesday, June 17, 2015, at 7:00 p.m. <i>(corrected)</i> City Council Chambers, Sunnyvale City Hall 456 West Olive Avenue Sunnyvale, CA 94086
Project Title:	Sunnyvale Land Use and Transportation Element (LUTE) Update (SCH #2012032003)
Project Applicant:	City of Sunnyvale, Trudi Ryan, (408) 730-7435

Sincerely, Trudi Ryan Title: Planning Officer Telephone: (408) 730-7435 E-Mail: TRyan@sunnyvale.ca.gov

455 Golden Gate Avenue, Suite 10600, San Francisco, California 94102 tel 415 352 3600 fax 415 352 3606

June 26, 2015

Trudi Ryan City of Sunnyvale Community Development Dept. 456 West Olive Avenue Sunnyvale, CA, 94088

SUBJECT: BCDC Inquiry File MC.MC.8704.1, Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Land Use and Transportation Element (LUTE) (SCH #2012032003).

Dear Trudi Ryan:

Thank you for the opportunity to comment on the Notice of Preparation dated May 26, 2015, and received in our office on May 27, 2015. These staff comments are based on the San Francisco Bay Conservation and Development Commission (BCDC) laws and policies, the McAteer-Petris Act, and the provisions of the *San Francisco Bay Plan* (Bay Plan). In particular, these comments are related to BCDC jurisdiction, bay fill, public access, fish, other organisms and wildlife, transportation, shoreline protection and climate change.

Jurisdiction and Authority. BCDC is responsible for granting or denying permits for any proposed fill (earth or any other substance or material, including pilings or structures placed on pilings, and floating structures moored for extended periods), extraction of materials or change in use of any water, land or structure within the Commission's jurisdiction. Generally, BCDC's jurisdiction over San Francisco Bay includes tidal areas up to the mean high tide level, including all sloughs, and in marshlands up to five feet above mean sea level; a shoreline band consisting of territory located between the shoreline of the Bay and 100 feet landward and parallel to the shoreline; salt ponds; managed wetlands (areas diked from the Bay and managed as duck clubs); and certain waterways tributary to the Bay.

The Commission can grant a permit for a project if it finds that the project is either (1) necessary to the health, safety or welfare of the public in the entire Bay Area, or (2) is consistent with the provisions of the McAteer-Petris Act. The McAteer-Petris Act provides for fill in the Bay for water-oriented uses where there is no alternative upland location and requires that any fill that is placed in the Bay is the minimum necessary for the project. The McAteer-Petris Act also requires that proposed projects include the maximum feasible public access consistent with the project to the Bay and its shoreline.

Projects approved by BCDC must also be consistent with the Bay Plan. The Bay Plan includes priority land use designations to ensure that sufficient lands around the Bay shoreline are reserved for important water-oriented uses such as ports, airports, water-related industry, parks, and wildlife areas. The Bay Plan also includes policies that address protecting the Bay as a resource, and provide for the wise use and development of the Bay and its shoreline.

The attached Bay Plan Map 7 depicts the Don Edwards Wildlife Refuge, which is a designated wildlife refuge in the Bay Plan located in the vicinity of Sunnyvale.

Trudi Ryan City of Sunnyvale Community Development Dept. June 26, 2015 Page 2

Public Access and Bay Fill. Section 66602 of the McAteer-Petris Act states, in part, that "existing public access to the shoreline and waters of the San Francisco Bay is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided."

Bay Plan policies require that public access be designed and maintained to avoid flood damage due to sea level rise and storms. Any public access provided as a condition of development must either remain viable in the event of future sea level rise or flooding, or equivalent access consistent with the project must be provided nearby. As there are biological resources along the shoreline, the Draft EIR should also consider the Bay Plan policies that aim to maximize public access opportunities while minimizing significant adverse impacts upon wildlife.

If any projects identified in the Draft EIR may require bay fill or new shoreline development within BCDC's jurisdiction, then the Draft EIR should consider the Commission's fill policies, which allow for fill to be placed in the Bay to protect existing and planned development from flooding as well as erosion. New projects on fill that are likely to be affected by future sea level rise and storm activity during the life of the project must: be set back from the shoreline to avoid flooding; be elevated above expected flood elevations; be designed to tolerate flooding or employ other means of addressing flood risks.

Fish, Other Aquatic Organisms and Wildlife. If the projects identified in the DEIR would have impacts upon biological resources, then the DEIR should discuss the relevant policies on Fish, Other Aquatic Organisms and Wildlife which state, in part, "To assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased." Project elements that could impact biological resources could include elements that entail bay filling with BCDC jurisdiction.

Transportation and Land Use. As the NOP is focused on the update of the Transportation and Land Use element it should consider the transportation policies in the Bay Plan. Because of the continuing vulnerability of the Bay to filling for transportation and development projects, the transportation findings of the Bay Plan state, in part, "pressure to fill the Bay for surface transportation projects can be reduced by improving the efficiency and increasing the capacity of existing transportation facilities and services, increasing access to public transit, providing safe and convenient public pathways for non-motorized forms of travel (e.g. bicycles, pedestrian)" and "transportation projects should be designed to maintain and enhance visual and physical access to the Bay and along the Bay shoreline." Furthermore, Bay Plan policies state, in part, "Transportation projects along the Bay shoreline and bridges over the Bay or certain waterways should include pedestrian and bicycle paths that will either be a part of the Bay Trail or connect the Bay Trail with other regional and community trails. Trudi Ryan City of Sunnyvale Community Development Dept. June 26, 2015 Page 3

Climate Change, Shoreline Protection and Safety of Fills. If the DEIR envisions the needs for shoreline protection then the DEIR should consider the Bay Plan policies that require shoreline protection, such as levees and seawalls, to be designed to withstand the effects of projected sea level rise and to be integrated with adjacent shoreline protection. Sea level risk assessments are required when planning shoreline areas or designing larger shoreline projects. Risk assessments are not required for repairs of existing facilities, interim projects, small projects or infill projects. Whenever feasible, projects must integrate hard shoreline protection structures with natural features that enhance the Bay ecosystem, e.g., by including marsh or upland vegetation in the design. Where it is feasible, ecosystem restoration projects must be designed to provide space for marsh migration as sea level rises.

The Bay Plan policies on Safety of Fills state, in part, "rights-of-way for levees or other structures protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay."

We regret that the City of Sunnyvale has removed the Climate Action Plan (CAP) from the city's General Plan given the impending impacts of sea level rise (SLR) on the city's roads and other waterfront assets. As the Santa Clara County Civil Grand Jury concluded in a recent report, the city of Sunnyvale, among others, "should prioritize SLR at a higher level." ¹ We understand that once the LUTE is adopted, the CAP will be updated separately and we hope both documents reflect the city's commitment to plan for sea level rise. We hope that the city will identify and pursue measures in the CAP to build community resiliency by addressing the impacts of SLR and storms with the same vigor as its vision to reduce greenhouse gas emissions. We recommend that the LUTE be implemented in accordance with the Climate Action Plan.

Thank you for the opportunity to comment on the Notice of Preparation. If you have any questions regarding this letter please contact me directly at (415) 352-3631 or by e-mail at miriam.torres@bcdc.ca.gov.

Sinceret MIRIAM TORRES

Coastal Planner

MT/go Enc.

cc: State Clearinghouse

¹ 2014-2015 Santa Clara county Civil Grand Jury Report. A Slow Rising Emergency --- Sea Level Rise. 18



San Francisco Bay Plan Reprinted March 2012 STATE OF CALIFORNIA-CALIFORNIA STATE TRANSPORTATION AGENCY

DEPARTMENT OF TRANSPORTATION

DISTRICT 4 P.O. BOX 23660 OAKLAND, CA 94623-0660 PHONE (510) 286-5528 FAX (510) 286-5559 TTY 711 www.dot.ca.gov

June 24, 2015

Ms. Trudi Ryan Community Development Department City of Sunnyvale 456 W. Olive Avenue Sunnyvale, CA 94088

Dear Ms. Ryan:

General Plan Land Use and Transportation Element (LUTE) – Notice of Preparation (NOP)

Thank you for continuing to include the California Department of Transportation (Caltrans) in the environmental review process for the project referenced above. The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Caltrans District 4 Local Development-Intergovernmental Review (LD-IGR) Program reviews land use and plans to ensure consistency with our mission and state planning priorities of infill, conservationism, and efficient development. We have reviewed the NOP and have the following comments to offer. Please also refer to the Caltrans comment letter, dated April 2, 2012, on the previous NOP. We provide these comments consistent with the State's smart mobility goals to support a vibrant economy and build communities, not sprawl.

Project Understanding

The proposed project establishes the framework of how the City of Sunnyvale (City) will be laid out and how various land uses, developments, and transportation facilities will function together. It includes a series of land use and transportation policies, action statements, and strategies that provide direction for how much the City will change and grow between now and 2035, and where the growth will take place. This is a reissued NOP which removes the Climate Action Plan (adopted separately) from the proposed project, incorporates numerous changes to the draft LUTE, and establishes a new baseline for environmental and regulatory setting discussions in the forthcoming Environmental Impact Report (EIR).

Lead Agency

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As the lead agency, the City is responsible for all project mitigation, including any needed improvements to State highways. The project's fair share contribution, financing, scheduling,

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"





Serious Drought. Help save water/

SCLVAR039 SCL/VAR/PM VAR SCH# 2012032003 Ms. Trudi Ryan/City of Sunnyvale June 24, 2015 Page 2

implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Traffic Impact Analysis

The environmental document should include an analysis of the travel demand expected from the proposed project. Caltrans is in the process of updating its *Guide for the Preparation of Traffic Impact Studies* (TIS Guide) for consistency with Senate Bill 743, but meanwhile we recommend using the Caltrans TIS Guide for determining which scenarios and methodologies to use in the analysis, available at: http://dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf. The LUTE should provide a thorough analysis of multi-modal travel demand and of the vehicle miles traveled (VMT) reductions that could be achieved through various travel demand management (TDM) measures.

Please ensure that a TIA is prepared providing the information detailed below:

- 1. Vicinity map, regional location map, and a site plan clearly showing project access in relation to nearby State roadways. Ingress and egress for all project components should be clearly identified. Clearly identify the State right-of-way (ROW). Project driveways, local roads and intersections, car/bike parking, and transit facilities should be mapped.
- 2. Project-related trip generation, distribution, and assignment including per capita use of transit, rideshare or active transportation modes such as existing bus service; the El Camino Real Bus Rapid Transit (BRT) and other new bus service, such as service to major transit centers like the Sunnyvale and Lawrence Caltrain Stations and the San Jose Airport; and VMT reduction factors. The assumptions and methodologies used to develop this information should be detailed in the study, utilize the latest place-based research, and be supported with appropriate documentation.
- 3. 2035 Cumulative Conditions and 2035 Cumulative Plus Project Conditions.
- 4. The project site building potential as identified in the General Plan. The project's consistency with both the Circulation Element of the General Plan and the Congestion Management Agency's Congestion Management Plan should be evaluated.
- 5. Schematic illustration of walking, biking and auto conditions at the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, (i.e., lane configurations, for AM and PM peak periods). Potential safety issues for all road users should be identified and fully mitigated.
- 6. Mitigation for any roadway sections or intersection with increasing VMT should be identified. Mitigation may include contributions to the regional fee program as applicable (described below), and should support the use of transit and active transportation modes. Because of the location of the project, Caltrans recommends the City consider mitigation measure options which would allow the City to ensure that direct and indirect traffic impacts, as well as the contribution to cumulative traffic impacts, from the project are mitigated to the

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and itrability"

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Ms. Trudi Ryan/City of Sunnyvale June 24, 2015 Page 4

Should you have any questions regarding this letter, please contact Brian Ashurst at (510) 286-5505 or brian.ashurst@dot.ca.gov.

Sincerely,

NOC خ

PATRICIA MAURICE District Branch Chief Local Development - Intergovernmental Review

c: Scott Morgan, State Clearinghouse Robert Swierk, Santa Clara Valley Transportation Authority (VTA) - electronic copy Robert Cunningham, Santa Clara Valley Transportation Authority (VTA) - electronic copy

CITY MANAGER TO MAYOR:	MAYOR'S DIRECTION / COMMENTS / INQUIRY:
 No Action Required Suggest we discuss Letter in process for Mayor's signature Referred to	Date of Mayor's Request/Comments: Mayor requires a copy of this document. Mayor requires original. (Returned after creation of file copy).
City Manager Comments or Direction to Staff:	Lead Department: CRM #:

(If no due date indicated, then response time in compliance with Council Policy Number: 7.3.13, Section G.)

INFORMATION FROM COUNCIL EXECUTIVE ASSISTANT: <u>NOTE</u> : Per Admin. Policy, this information will be retained in Council Files.	
 Other Council have also received via (circle one): mail, hand-delivery: All Council Received Specific Council Received: 	DECEIVED
 Exec. Asst. has also distributed to, or copied, Council Other Distribution: Additional Comments: 	City Council Office





June 11, 2015

Honorable Jim Griffith Mayor, City of Sunnyvale 456 West Olive Avenue P. O. Box 3707 Sunnyvale, California 94088-3707

Dear Mayor Griffith,

Pursuant to Penal Code § 933.05(f), the 2014-2015 Santa Clara County Civil Grand Jury is transmitting to you its Final Report, A Slow Rising Emergency – Sea Level Rise.

Penal Code § 933.05(f) states the following:

A grand jury shall provide to the affected agency a copy of the portion of the grand jury report relating to that person or entity <u>two working days</u> prior to its public release and after the approval of the presiding judge. No officer, agency, department or governing body of a public agency shall disclose any contents of the report prior to the public release of the final report. Leg. H. 1996 ch. 1170, 1997 ch. 443.

This report will be made public and released to the media on Tuesday, June 16, 2015, at 10 a.m. If you have any questions please contact Tamara Davis, Deputy Manager for the Civil Grand Jury, at: (408) 882-2721.

Sincerely,

Elaine K. Larson Foreperson 2014-2015 Civil Grand Jury

Encl.: A Slow Rising Emergency - Sea Level Rise

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2014-2015 SANTA CLARA COUNTY CIVIL GRAND JURY REPORT

A SLOW RISING EMERGENCY --- SEA LEVEL RISE

Summary

The 2014-2015 Santa Clara County Civil Grand Jury (Grand Jury) received a complaint questioning three areas regarding expected Sea Level Rise (SLR) as a result of global warming. The three questions the Grand Jury was asked to investigate were:

- Is the current level of disaster planning sufficient to mitigate the expected effects, both immediate and long term, of global warming, specifically as it relates to SLR?
- What, if any, are the long range plans of Santa Clara County (County), cities, and some agencies within the county, for changing infrastructure elements and vacating lands that could be flooded by a one to two meter rise in sea level of San Francisco Bay (Bay)?
- What is being done to inform and educate private landowners whose land will be at risk of flooding from SLR?

The Grand Jury interviewed representatives from the cities in the County that abut the San Francisco Bay ("Bay") and have addressed SLR (Palo Alto, Mountain View, Sunnyvale, and San Jose) as well as other government entities. One city, Milpitas, indicated that it had not addressed this issue and, as a result, they were not interviewed. The purpose of the interviews was to determine what, if any, actions were being planned to confront and prevent the negative consequences of SLR.

The Grand Jury reviewed a great deal of information and many studies addressing SLR and found:

- The current flood control systems are not adequate to prevent flooding with the expected SLR,
- There is inconsistency among the cities and county that abut the Bay with regard to addressing the issue of SLR, and
- There are plans, overseen by the U.S. Army Corps of Engineers (Corps of Engineers), the Santa Clara Valley Water District (Water District), and the California State Coastal Conservancy (Coastal Conservancy), to address this issue.

It does not appear that every government entity in the county that should be addressing SLR is doing so. Some local governments have studied and published reports on the effect of SLR but others have not. Consequently, we have a disjointed approach within the county to address the ramifications of SLR.

Background

The Causes of Sea Level Rise

According to the National Geographic Society, there are three main reasons for the rise in the ocean's level. These are:

- Oceanic Thermal Expansion. When water heats, it expands, and when the oceans are constrained by land mass, the only direction the oceans can move is upward to inundate low lying regions of land,
- Melting of Glaciers World-Wide and both Polar Ice Caps. There
 is currently more ice melting in summer than is replaced by snowfall
 during winter, and
- Ice Loss from Greenland and West Antarctica. The winter snowfall on these land masses does not currently replenish the amount of ice that melts during summer.

The National Oceanic and Atmospheric Administration (NOAA) has tracked the rise in ocean temperature from 1880 to the present. As can be seen in the section titled "Ocean" in the following chart, it is evident that since 1880 the ocean's temperature is rising and has risen rapidly in the recent past.



Studies of Sea Level Rise

Since 1987, there have been numerous studies conducted of the Bay and the effects of potential SLR. Some examples of these studies are:

- "Sea Level Rise: Predications and Implications for San Francisco Bay" [1987, Bay Conservation and Development Commission (BCDC)],
- "Assessing The Costs Of Adapting To Sea-Level Rise: A Case Study Of San Francisco Bay" (1990, Peter Gleick and Edwin Maurer, Pacific Institute),
- "Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline" (2011, BCDC),
- "Sea-Level Rise: a Slow-Moving Emergency" (2014, California State Assembly Select Committee; Sea Level Rise and the California Economy),
- "The Impacts of Sea Level Rise on the San Francisco Bay" (2012, California Energy Commission's California Climate Change Center),
- "Evaluating Tidal Marsh Sustainability in the Face of Sea-Level Rise: A Hybrid Modeling Approach Applied to San Francisco Bay" (2011, Plus One),
- "The Impacts of Sea-Level Rise on the California Coast" (2009, Pacific Institute),
- "Sea Level Rise Study; Feasibility Report and Capital Improvement Program" [2012, City of Mountain View/Environmental Science

Associates and Phillip Williams and Associates (ESA/PWA)], and

"Adapting to Rising Tides" (2013, an ongoing study supported by the NOAA Coastal Services Center and the BCDC).

The studies consistently address a range of different projected rises in sea level through the end of the century. These ranges in SLR are estimated at 10 to 17 inches by 2050, 17 to 32 inches by 2070, and 32 to 69 inches by the turn of the century. The international scientific community now generally accepts these estimates of SLR.

Measuring Sea Level Rise in the Bay

On June 30, 1854, the United States Coast Survey, now known as the National Geodetic Survey (NGS), installed a self-recording tide gauge in the Bay. This station has measured the rise and fall of tides continuously since then, making it the nation's oldest continually operating tidal observation station. The average of the high and low tides measures the current sea level.

The following chart displays the readings from the San Francisco tide gauge house and documents that the Bay level is rising.



Awareness of Sea Level Rise

The California State Assembly Select Committee on Sea Level Rise and the California Economy published a report in August of 2014 titled, "Sea-Level Rise: a Slow Moving Emergency." In the introduction of this report it states:

The sea is rising. The Nation's longest continuously operating gauge of sea level, at Fort Point in San Francisco Bay, recorded a seven-inch rise in the sea level over the 20th century. As a result of climate change and global warming, sea-level rise is projected to accelerate during the next century. Even if greenhouse gas emissions are reduced, residual warming of the ocean will cause seas to continue to rise. A 2012 report from the National Research Council found that the average sea-level rise projections for California are an additional 6 inches by 2030, 12 inches by

2050, and 36 inches (3 feet) by 2100. As a result of these projections, sea-level rise has been called a slow-moving emergency. The Fact is that California is indeed facing an emergency.

The International Intergovernmental Panel on Climate Change (IPCC), with 195 countries participating, is the leading authority on climate related SLR. Their mission is to study and monitor the effects of global climate change. Since 1990, the IPCC has released five "Assessment Reports." On November 1, 2014, the fifth Assessment Report (AR5) was released by the IPCC, which divided the "Observed changes in the climate system" into four entities. They are Atmosphere, Ocean, Cryosphere¹, and Sea Level.

AR5's opening sentence when addressing the issue of sea level is:

Over the period 1901–2010, global mean sea level rose by 0.19m (7.5") [0.17m to 0.21m] (6.7"-8.25"). The rate of sea-level rise since the mid-19th century has been larger than the mean rate during the previous two millennia.

The IPCC and the State of California (State) have indicated that a major consequence of climate change is Sea Level Rise.

Possible Sea Level Rise in Santa Clara County

"The South San Francisco Bay Shoreline Study" (Bay Shoreline Study) is produced by a consortium consisting of the Corps of Engineers, the Water District, and the Coastal Conservancy. The purpose of this study is to identify and recommend flood risk management and ecosystem restoration projects along the Bay to justify federal funding.

According to the Bay Shoreline Study calculations, the figure in Appendix B shows the effects of a 16 inch sea level rise (pink) and a 55 inch sea level rise (red). The Silicon Valley Leadership Group that addresses environmental programs and policies has stated: "A total of 257 technology companies located in the flood zone are at significant risk."

California and Local Governmental Responses to Sea Level Rise

California

Assembly Bill 32 titled "California Global Warming Solution Act" was passed and signed

¹ The cryosphere is those portions of Earth's surface where water is in solid form, including sea ice, lake ice, river ice, snow cover, glaciers, ice caps, ice sheets, and frozen ground.

on September 27, 2006. This bill directs the State to reduce greenhouse gas emission levels to that of 1990 and to accomplish this by 2020. The focus for most county governments has been on climate action plans and the creation of organizations within county governments, such as the Santa Clara County Office of Sustainability, to meet AB 32's goals. Again, the primary purpose of AB 32 is greenhouse gases and their reduction.

Unfortunately, no comparable act has been passed by the State nor has a government organization been established in the county to address SLR. Therefore, each local government entity that abuts the Bay is addressing SLR as they deem appropriate. The following is a brief description of how each of these local governments is or is not addressing SLR.

Palo Alto

The Grand Jury learned from interviews with the representatives of the City of Palo Alto (Palo Alto), and research, the following:

- 1. Palo Alto's focus is on sustainability, greenhouse gas reduction, and updating their Climate Action Plan. A little over a year ago, Palo Alto appointed a Chief Sustainability Officer to oversee the city's Climate Action Plan,
- Palo Alto is unaware of actions being considered or taken to address SLR by the neighboring cities of Sunnyvale and Mountain View,
- 3. Palo Alto is a member of the San Francisquito Creek Joint Powers Authority, as is the Water District. Per their website, this authority leads projects along the creek and the Bay that reduce a proven flood threat (not a product of SLR) enhance ecosystems and recreational opportunities, and connect the communities. This joint powers authority recently began to look at different infrastructure alternatives to protect Menlo Park, East Palo Alto, and Palo Alto against extreme tides as a consequence of SLR, and working with other agencies to improve shoreline habitat, and
- 4. In August 2014, the City of Palo Alto released their "Threat and Hazard Identification and Risk Assessment." The report evaluates vulnerability and decides implementation measures based on the necessary capabilities to deal with the hazards and threats. SLR is not one of the hazards in this report, but flooding and severe winter storms are.²

² Threat and Hazard Identification and Risk Assessment, p.4

Milpitas

The City of Milpitas (Milpitas) has told the Grand Jury that it is not addressing SLR. It has a 100 page climate action plan, titled, "City of Milpitas: Resolution 8252: A Resolution of the City Council of the City of Milpitas adopting Negative Declarations and Climate Action Plan (5/7/2013)." The plan does not mention SLR, but only addresses greenhouse gas reductions.

Sunnyvale

The City of Sunnyvale (Sunnyvale) is in the very early stages of the SLR issue. Through interviews, the Grand Jury has learned the following:

- 1. As of April 2014, it has a Climate Action Plan that mentions adapting to SLR and the effects on Sunnyvale,
- 2. There is a lack of urgency or immediacy of action due not only to the lack of funds, but also a belief that SLR is so far in the future,
- 3. Officials of Sunnyvale told the Grand Jury that they are unaware of SLR plans being taken by their neighboring communities, and
- 4. Officials of Sunnyvale stated that they would like an organization to take a leadership role to coordinate everyone's efforts.

Mountain View

The City of Mountain View (Mountain View) has an extensive plan in place and is taking steps, mostly on its own, to address the threat of SLR. The Grand Jury has learned the following:

- 1. Mountain View appointed an Environmental Sustainability Coordinator who focuses almost exclusively on the potential impact of greenhouse gases,³
- 2. The threat of SLR is being addressed by the city through its Public Works Department. With the help of ESA/PWA, the department produced the "Shoreline Regional Park Community: Sea Level Rise Study: Feasibility Report and Capital Improvement Program," which addressed both the threat of SLR to the city as a whole and the threat posed in the salt ponds areas of the city. The latter, as proposed by the report, requires creating a gently sloped upland habitat transition area along the bay ward levee slope.⁴ Responsibility for designing levees in Mountain View's Action Plan area is assumed by the department working in consultation with the Water District, which, in turn, is working with the US Army Corps of Engineers,
- 3. The Bay Shoreline Study indicated that Mountain View was not a priority area, thus the city moved on its own in the expectation that

³"City of Mountain View: Climate Change: Environmental Sustainability Action Plans"

⁴ "City of Mountain View: Climate Change: Environmental Sustainability Action Plans," 12/18/2012, p. 2
a future study might revise that assessment, and

- 4. The current proposals the city is addressing include:
 - a. Charleston Slough and Palo Alto Flood Basin Levee Improvement,
 - b. Coast Casey North Levee Improvement,
 - c. Landfill Erosion Protection,
 - d. Lower Permanente Creek Levee and Floodwall Improvements,
 - e. Golf Course Facilities High Ground Augmentation,
 - f. Lower Stevens Creek Levee Improvements,
 - g. Coast Casey Pump Station Improvement,
 - h. Lower Permanente Creek Storm Drain Improvements,
 - i. Sailing Lake Access Improvement,
 - j. Sailing Lake Intake Pump Station Modification, and
 - k. Charleston Slough Tide Gates Improvement.⁵

NOTE: All of these areas are currently at risk due to the threat of flooding. That risk, however, increases when also threatened by SLR.⁶ The total estimated cost to complete the Mountain View projects is \$43 to \$57 million up front with an annual operating budget of \$117,000 to \$130,000 (in 2012 dollars). The City will fund these expenditures on its own.⁷

5. The Grand Jury was told that Mountain View would like more county-wide coordination in addressing the SLR issue.

San Jose/Alviso

Issues of SLR for the City of San José/Alviso are being coordinated by the Water District.

Santa Clara Valley Water District Response to Sea Level Rising

From 1929, with the formation of the Santa Clara Valley Water Conservation District, to 1952, with the establishment of the Santa Clara Valley Flood Control and Water Conservation District, there were several water districts in the county that were responsible for building reservoirs and recharging the underground aquifers. In 1952, the Santa Clara County Board of Supervisors merged these districts into the Santa Clara Valley Water Conservation District. They gave the district the task of protecting

⁶ ld. at 9

7 Id. at 8

⁵ ld. at 6-7

most of the County from flooding and providing water to the County residents. In the 1970s, this District was renamed the Santa Clara Valley Water District and given responsibility for flood control and water supply for the County.

The Water District was created by an act of the California Legislature, and operates as a State of California Special District, with jurisdiction throughout Santa Clara County. This act is the "Santa Clara Valley Water District Act."⁸

Per Section 4, the Santa Clara Valley Water District Act's primary purpose is "to authorize the district to provide comprehensive water management for all beneficial uses and protection from flooding within Santa Clara County." In doing so, the legislature made it clear that "it is the intent of the Legislature that the district work collaboratively with other appropriate entities in Santa Clara County in carrying out the purposes of this act."

The aforementioned Bay Shoreline Study is the Water District's response to SLR in the Santa Clara County. It is a countywide plan to address SLR along the entire coastline of Santa Clara County.

The Act gives the Water District "Powers" in order to carry out their purposes. Per §5.12., the Water Districts is given the power "To make contracts, and to employ labor, and to do all acts necessary for the full exercise of all powers vested in the district or any officers thereof, by this Act."⁹ The Water District has entered into at least four (4) joint committees and one joint powers authority." The four committees are:

- Joint Recycled Water Advisory Committee with the City of Palo Alto,
- Joint Recycled Water Committee with the City of Sunnyvale,
- Joint Recycled Water Policy Advisory Committee with the City of San José and the City of Santa Clara, and
- San Felipe Division Reach One Committee with San Benito County Water District.

The members of the San Francisquito Creek Joint Powers Authority are the Santa Clara Valley Water District, together with Palo Alto, East Palo Alto, Menlo Park, and San Mateo County Flood Control District.

The Grand Jury has learned through interviews the following:

⁸ See Santa Clara Valley Water District Act §60-1 et. seq.

⁹ Santa Clara Valley Water District Act §60-5(12).

- 1. The cities that abut the Bay have very little information about the Bay Shoreline Study,
- 2. Mountain View is addressing SLR independent of the Water District,
 - 3. The Water District is part of a San Francisquito Creek Joint Powers Authority together with Palo Alto, East Palo Alto, Menlo Park, and San Mateo County Flood Control District, and
 - 4. There is no joint power authority or any other agreement between the Water District and the cities of Milpitas, Sunnyvale, Mountain View or Palo Alto in regard to dealing with SLR in Santa Clara County.

The Cost of Not Addressing Rising Sea Level

Additionally, the Grand Jury was told that if the flood hits the water treatment plants in Palo Alto, Sunnyvale, and San José, the total value at risk more than doubles and up to a foot of water will cover Highways 101 and 237.¹⁰ There remain concerns of rising sea levels flooding additional lands near the Bay. Also, in the case of severe rainstorms, there is an additional concern, that because of a higher Bay level, there will be more flooding in the lower stream beds.

Response to Anticipated Sea Level Rise

At the time of the Grand Jury's investigation, the City of Mountain View and the Water District have been the most active in studying the possibility of SLR and are preparing to implement responsive projects to protect from such a possibility. Mountain View initiated a project that culminated in the publication on December 18, 2012, of <u>"The Shoreline</u> Regional Park Community (Shoreline Community) Sea Level Rise Study Feasibility Report and Capital Improvement Program (CIP)."

The Water District joined the Corps of Engineers and the Coastal Conservancy in creating a congressionally authorized study to develop projects to address the risks from flooding due to SLR and restoration of the wetlands. On December 18, 2014, the Corps of Engineers released their "Draft South San Francisco Bay Shoreline Phase I Study, Draft Integrated Interim Feasibility Study and Environmental Impact Statement/Report." On January 14, 2015, the Grand Jury attended a public meeting held by the Corps of Engineers, Water District, and Coastal Conservancy. The purpose of the meeting was to discuss the study and to receive input to the aforementioned draft report. Public comments were solicited.

The Grand Jury learned through the interview process that most cities wanted to maintain local control but believe that some county-level coordination would be helpful. As a result, the cities and other relevant agencies have a wide, often disjointed array of

¹⁰ http://www.eenews.net/stories/1059974050

responses to SLR demonstrating varying levels of commitment, efficiency, and staffing.

On September 17, 2014, the Grand Jury toured the Water District's San Jose/Santa Clara Regional Wastewater Facility in Alviso. During this tour, it was pointed out to the Grand Jury that some of the construction observed was being performed in order to relocate underground electrical facilities to above ground. This was being done to prepare for the anticipated effects of SLR, and indicated that there are currently active efforts within the County to prepare for the effects of climate related SLR.

Methodology

In preparing this report, the Grand Jury:

- Toured the San Jose/Santa Clara Regional Waste Water Facility and the Silicon Valley Advanced Water Purification Center in San José,
- Toured the Don Edwards San Francisco Bay National Wildlife Refuge in Alviso,
- Submitted a questionnaire and received answers from the U.S. Army Corp of Engineers, South Pacific Division, San Francisco District,
- Reviewed portions of the "Draft Interim Feasibility Report and Environmental Impact Statement / Report South San Francisco Bay Shoreline Phase I Study Santa Clara County, CA," December 2014,
- Reviewed portions of the City of Mountain View's Shoreline Regional Park Community Sea Level Rise Study Feasibility Report and Capital Improvement Program, December 18, 2012,
- On January 14, 2015, members of the Grand Jury attended a meeting held in Alviso for the public discussion of the Draft Interim Feasibility Report and Environmental Impact Statement / Report South San Francisco Bay Shoreline Phase I Study Santa Clara County, CA (cited above),
- Interviewed representatives from the following:
 - o Santa Clara Valley Water District,
 - o San Jose/Santa Clara Regional Waste Water Facility,
 - o Santa Clara County Office of Sustainability,
 - o Consulting firm AECOM,
 - o Bay Conservation and Development Commission (BCDC),
 - o California State Coastal Conservancy (Coastal Conservancy),
 - o City of San José, Environmental Compliance Office,
 - o City of Mountain View, City Staff,
 - o City of Mountain View, Public Works Department,
 - o City of Sunnyvale, Environmental Services Department,
 - City of Palo Alto, Office of the City Manager,
- A questionnaire was completed and returned to the Grand Jury by the Corps of Engineers, and
 - Conducted web searches and read articles in newspapers and other publications.

Discussion

To better comprehend Sea Level Rise and how it relates to Santa Clara County, an understanding of the relevant terms and concepts is necessary. The current chosen solutions to protect property within Santa Clara County is to construct dikes and levees along the Bay and to promote wetlands and marshes at the edges of the Bay.

Dikes and Levees

Dikes and levees are walls that are made of stone, clay, and other earth materials. They are designed to hold back water from dry land. Dikes usually protect land that would otherwise be under water. Levees protect land that is usually above water but may be flooded at times.

The Bay Shoreline Study recommends building levees in Economic Impact Areas. See Appendix C. These areas were arbitrarily selected to describe portions of the Bay shore at risk for SLR. The first Economic Impact Area (EIA) that the study recommended to be addressed is EIA 11. Economic Impact Area 11 includes Alviso. Its homes, commercial and industrial facilities are generally located below sea level, and protected by salt pond levees.

When the project is completed, the new levees will be approximately 15 feet high which is about 5 feet higher than the current non-engineered levees that were built for the salt ponds. They will have a slope of 30 to 1 on the Bay side. This means that for every foot in height, the levee will extend 30 feet into the Bay. The following is a cross section of the proposed 30:1 levee.

Proposed Ecotone with 30:1 Side Slopes Cross-Section at Year 2017¹¹



Note: Figure of a person on top of the levee is used to establish scale.

Wetlands and Marshes

Wetlands are areas such as swamps, marshes, and bogs where water covers the soil, or is at or near the surface of the soil year round. They serve as giant filters removing toxic pollutants and nutrient runoff that could damage the ecosystem of the Bay. Some scientists feel that wetlands are as important as coral reefs and rain forests. A marsh is a type of wetland, which does not have trees or shrubs, but rather has grasses, rushes, sedges, and reeds. A marsh provides vital habitat to many plant and animal species as well as protecting neighboring areas of land from flooding, and in the case of saltwater marshes, preventing excessive salinization. In addition to filtering out pollutants and

¹¹ An ecotone is a transition area between two biomes. It is where two communities meet and integrate. It may be narrow or wide, and it may be local (the zone between a field and forest) or regional (the transition between forest and grassland ecosystems).

nutrient runoffs, wetlands have other advantages. They help by:

- capturing atmospheric carbon and storing it,
- serving as a natural sponge by absorbing large amounts of water due to tidal flooding or storm water releases, and
- providing a home to migratory and residential birds, fish and other marine life that use wetlands to forage, rest, and raise their young.

Wetlands also create a buffer against the consequences of SLR by:

- acting like a giant sponge, protecting the levees from damaging waves and tidal surges, and
- increasing levee height from the deposits of matter that rising sea level will bring into the wetlands thereby creating new and higher shorelines. The following figure shows what a 2017 levee might look like in 2067.

Proposed Ecotone with 30:1 Side Slopes Cross-Section at Year 2067



Note: Figure of a person on top of the levee is used to establish scale.

Benefit of Combining a Levee Project with a Wetland Restoration Project

In 2003, the 15,000 acre South Bay Salt Ponds were purchased from Cargill, Inc. by the federal government, the State of California, and the City of San José. These 15,000 acres are divided into three pond areas, the Ravenswood Ponds on the west shore of the Bay near Menlo Park, the Alviso Ponds that lie between the eastern edge of the Charleston Slough in Palo Alto to approximately 1 ³/₄ mile north of Coyote Creek in Milpitas, and the Eden Landing Ponds on the east shoreline of the bay near Hayward. The Federal stewardship of this property was placed in the hands of the U.S. Fish and Wildlife Service and the State stewardship of this property is in the hands of the California State Coastal Conservancy. The restoration of the south bay salt ponds is the largest tidal wetland restoration project on the West Coast and is aptly named the South Bay Salt Pond Restoration Project (Salt Pond Restoration Project).

In 2005, Congress authorized the Bay Shoreline Study. It was designed to coordinate the ecosystem restoration of the salt ponds (Salt Pond Restoration Project) with a flood risk management project in light of the SLR in the Bay. Therefore, completion of the project proposed by the Bay Shoreline Study could complete a significant portion of the Salt Pond Restoration Project in the Alviso area.

Consequences of the Bay Shoreline Study

The Santa Clara County "coastline" along the San Francisco Bay is approximately 15 miles long. The April 2013 "California's Flood Future" report from the California State Department of Water Resources and the Corps of Engineers, finds that the County ranks second in the State in potential flood losses and third in the number of people exposed to flood danger. The Grand Jury was told by the Corps of Engineers that the Bay shoreline and the watersheds of Guadalupe and Coyote creeks pose much of the danger.

The purpose of the Bay Shoreline Study is to identify flood risk management and ecosystem restoration projects. The partners in the Bay Shoreline Study are the Corps of Engineers, the Water District, and the Coastal Conservancy. The Bay Shoreline Study divided the south Bay into fourteen (14) EIAs, only eleven (11) of these are in the County. The Bay Shoreline Study developed equivalent annual flood damage estimates for EIAs generally located between each creek system along the shoreline.

Some EIAs experience higher equivalent annual flood damages than others. EIA 11 in the Alviso area was among the highest and well known for its flooding issues. EIA 11 extends from the Guadalupe River (in the west) to Coyote creek (in the east). It extends in the south to include both the community of Alviso and the San Jose/Santa Clara Water Pollution Control Plant.

Studies Evaluating Sea Level Rise and Flooding in the Bay

In November 2013, the California Department of Water Resources and the US Army Corp of Engineers issued a joint report, titled, "California's Flood Future." Its purpose was to assess the level of flood exposure statewide, identify flood management issues, and develop recommendations to help address California's flood risk. This report states that:

... continuation or acceleration of this sea level rise, in combination with changes in precipitation and runoff patterns, likely would result in an increase in flood events...

and

... projected increase in flood inundation in the San Francisco Bay under one scenario of sea level rise... could be significant, especially in the south Bay Area where there are high levels of urbanization.¹²

The draft produced by the Bay Shoreline Study consortium concurs with the California

¹² California's Flood Future at 1-9 and the second quote is from pages 3-17.

Flood Future report. They both agree that there is currently a significant threat of major tidal flooding throughout the Alviso community, and this threat is projected to increase significantly over time because of SLR.¹³ Therefore, when the above mentioned partners in the Bay Shoreline Study were contemplating where to begin the project it was natural to select EIA 11.

In addition, the selection of EIA 11 means that the flood control project could be tied in with the Salt Pond Restoration Project. This project's goal is the restoration of approximately 15,000 acres of former industrial salt ponds into tidal wetlands for animal and fish habitat, recreational use, and flood protection. If the Bay Shoreline Study receives federal funding, then this would allow these federal funds to be leveraged with state and local funds to accomplish some, if not the entire Salt Pond Restoration Project.

The Bay Shoreline Study advocates the creation of a two pronged project in which flood protection (levee) is built while concurrently restoring tidal wetlands in the south Bay. The proposed levee will be approximately 3.7 miles long which is approximately 25 percent of the Santa Clara County coastline. The levee will run from Guadalupe River to Coyote Creek. It is planned to be at a height of 15.2 feet and have a slope of 30 to 1. The estimated cost of this first phase of flood protection for EIA 11 is \$162,630,000. This would be divided as follows; U.S. Fish and Wildlife \$39,712,000, Corps of Engineers \$52,371,000, and non-Federal \$70,547,000. The Water District and California State Coastal Conservancy (CSCC) are the non-Federal sponsors.¹⁴ After completing this phase, the partners would then turn their attention toward EIA 1 – EIA 10. It is estimated that to complete EIA 1 through EIA 10, the cost will be approximately \$400-\$500 million.

Conclusions

There has been a great deal of time and effort devoted to studying the effects of Sea Level Rise (SLR) in the San Francisco Bay. These studies continue today, as those in various scientific specialties learn more about the fact that the sea is rising.

The Corps of Engineers, the Coastal Conservancy, and the Water District are currently addressing SLR as partners in the consortium, the "South San Francisco Bay Shoreline Study." The consortium produced a document that addresses some critical issues for Santa Clara County. It addresses not only SLR, but also the restoration of the salt ponds and the preservation of native habitats.

¹³ Draft South San Francisco Bay Shoreline Phase I Study, Draft Integrated Interim Feasibility Study and Environmental Impact/Report, Phase I study report at S.10

¹⁴ Id. at S.4

If and when the South San Francisco Bay Shoreline Study recommended project for EIA 11, which includes Alviso, is completed, the county will have in place a levee and marshland, but these measures will only address the effects of SLR for the next few decades.

The Grand Jury reached the following conclusions:

- The cities of Palo Alto, Mountain View, and Sunnyvale want to retain control of SLR related efforts within their jurisdictions, but would like to have an organization assume responsibility for coordinating the plans and activities involved in addressing SLR.
- Within Santa Clara County, Milpitas has no plan to address SLR.
- The Water District, which is, by law, tasked with the responsibility for flood control in Santa Clara County, should take a sufficiently proactive leadership role in Santa Clara County's efforts to address SLR. They are participating in the South San Francisco Bay Shoreline Study, have active projects underway, and are best prepared and qualified for the role of coordinating efforts to coordinate SLR for Santa Clara County,
- Since the effects of SLR are not imminent, there is a lack of urgency in addressing this pending emergency. The scientific community, however, is giving long range future projections, indicating possibly devastating consequences in Santa Clara County. Nevertheless, the Grand Jury was told those consequences are seen by some jurisdictions as so far off in the future, that they have not seen a need to address its effects on the infrastructure and economy of Santa Clara County. The cities of Palo Alto, Mountain View, Sunnyvale, and Milpitas, as well as the Santa Clara Valley Water District should prioritize SLR at a higher level,
- As a consortium, the Corps of Engineers, the Coastal Conservancy, and the Water District are currently addressing SLR. The "South San Francisco Bay Shoreline Study" addresses not only SLR but also the restoration of the salt ponds and the preservation of native habitat. If the EIA 11 Alviso project is completed, the county would have in place a levee and marshland that would address the effects of SLR for the next few decades, and
- There has been very little dissemination of information about how the four cities within the County and the Santa Clara Valley Water District are addressing the effects of SLR. The Grand Jury was told this has led to a sense of complacency.

Findings and Recommendations

Finding 1

The cities of Palo Alto, Mountain View, and Sunnyvale want to retain control of Sea Level Rise related efforts within their jurisdictions, but would like to have an organization assume responsibility for coordinating the plans and activities involved in addressing Sea Level Rise.

Recommendation 1

The Santa Clara Valley Water District should take a more proactive role in coordinating with cities that will be affected by Sea Level Rise, unifying, integrating and directing efforts in Santa Clara County.

Finding 2

The City of Milpitas does not have a Climate Action Plan which addresses Sea Level Rise.

Recommendation 2

The City of Milpitas needs to develop a Climate Action Plan which addresses Sea Level Rise.

Finding 3

The City of Palo Alto's 2014 "Threat and Hazard Identification and Risk Assessment" did not identify the effects of Sea Level Rise as one of the hazards.

Recommendation 3

The City of Palo Alto needs to identify Sea Level Rise as a hazard in its "Threat and Hazard Identification Risk Assessment.

Finding 4

The Santa Clara Valley Water District, which is by law tasked with the responsibility for flood control in Santa Clara County, has not coordinated Santa Clara County's efforts to address Sea Level Rise and all of the cities in Santa Clara County that abut the Bay.

Recommendation 4

The Santa Clara Valley Water District should coordinate Santa Clara County's effort to address Sea Level Rise for all of the cities in Santa Clara County that abut the Bay.

Finding 5

According to the Santa Clara Valley Water District's website, since July 2012, it has held only one public meeting to share information about Sea Level Rise.

Recommendation 5

The Santa Clara Valley Water District should provide more information for the residents of Santa Clara County about Sea Level Rise.

Appendix A Documents Reviewed

Documents/Articles/Maps

- Adapting to Rising Tides (BCDC, NOAA Coastal Service Center)
- Alviso to Artesian—Alignment 1 (Map)
- Artesian to Coyote—Alignment 1 (Map)
- As the Seas Rise, A Slow Motion Disaster gnaws at America's Shores (McNeill, Nelson, Wilson) (09/04/2014)
- Bay Area Plan: Regional Indicators (12/2011)
- California Adaptation Forum: Resilient Communities: Bringing Change to Life (08/19/2014)
- CAP Work Plan 2020 Implementation Matrix (12/04/2014)
- City of Milpitas: Resolution 8252: A Resolution of the City Council of the City of Milpitas Adopting Negative Declaration and Climate Action Plan (05/07/2013)
- City of Mountain View: Environmental Sustainability Action Plan (ESAP) (October 2008) and ESAP-2 (April 2012)
- City of Palo Alto: Threat and Hazard Identification and Risk Assessment (Prepared by Office of Emergency Services) (04/2014)
- City of Sunnyvale: Climate Action Plan (Prepared by PMC) (04/2014)
- City of Sunnyvale: Sunnyvale CAP Initial Study/Negative Declaration (Prepared by PMC for the City of Sunnyvale) (03/2014)
- Climate Change 2014: Synthesis Report (11/01/2014)
- Comparison of SLC Projections: San Francisco, CA NOAA Tide Gauge
- County of Santa Clara Office of the County Executive: Office of Sustainability (01/10/2012)
- Draft South San Francisco Bay Shoreline Phase I Study, Draft Integrated Interim Feasibility Study and Environmental Impact/Report

- Earthquake and Hazards Program (ABAG) (08/01/2014)
- Emergency Preparedness and Response: 10 Ways You Can be Disaster Prepared (02/13/2013)
- Glacial Melting In Antarctica Makes Continent The 'Ground Zero of Global Climate Change' (Henao and Borenstein) (02/27/2015)
- New Research May Solve Puzzle in Sea Level's Rise (01/14/2015)
- Obama Moves to Protect Against Flooding From Rising Sea Levels (01/30/2015)
- Office of the Press Secretary: The White House: Executive Order: Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (01/30/2015)
- Preparing for California Climate Change: Climatologist Looks Back and Peers Forward (USGS)(03/24/2014)
- San Diego Union Tribune: Del Mar Council Agrees to Address Sea Level Rise, 03/11/2015)
- San Francisco Bay Conservation and Development Commission (BCDC)
- San Jose Mercury News: Beach Bummer; Climate Change Could Bring Bad News for Surfers as Days of Big-wave Riding May be a Thing of the Past, (02/24/2015), p. A1
- San Jose Mercury News: Judge Nullifies Project Report (1,000 Home Proposal (12/24/2014), p.B5
- Santa Clara County: Home Improvement and Performance Program: Final Report (prepared by ICF International)
- Shoreline Regional Park Community: Sea Level Rise Study: Feasibility Report and Capital Improvement Program (ESA, PWA with AMEC, HDR, SCI, and HT Harvey) (for the City of Mountain View (12/18/2012)
- County of Santa Clara Office of Sustainability Silicon Valley 2.0 Project, January 2013 and is expected to be completed by June 2015
 - Silicon Valley 2.0 Project Schedule
 - Silicon Valley 2.0: A Regional Climate Change Adaptation and Climate Protection Initiative: Memorandum (08/22/2014)
 - Silicon Valley 2.0: A Regional Effort to Minimize the Impacts of Climate Change

- South Bay Salt Pond Restoration Project: Restoring the Wild Heart of the Silicon Valley
- The South San Francisco Bay Shoreline Study: Alviso Ponds and Santa Clara County Interim Feasibility Study (US Army Corps of Engineers, Coastal Conservancy, Santa Clara Valley Water District)
- Why Americans Are Flocking to Their Sinking Shores Even as the Risks Mount (Nelson, McNeill, Wilson) (09/17/2014)



Appendix B

Page 24 of 26

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Page 25 of 26

This report was PASSED and ADOPTED with a concurrence of at least 12 grand jurors on this <u>11 + </u>day of <u>4</u>, 2015.

Janos 8000 0)

Elaine K. Larson Foreperson

Inderwood emas

Wilma Faye Underwood Foreperson pro tem

Joe A. Lopez

Secretary

m

James L. Cunningham, Jr. Secretary pro tem



Edmund G. Brown Jr. Governor

STATE OF CALIFORNIA Governor's Office of Planning and Research State Clearinghouse and Planning Unit



Notice of Preparation

May 26, 2015

To: Reviewing Agencies

Re: Land Use and Transportation Element SCH# 2012032003

Attached for your review and comment is the Notice of Preparation (NOP) for the Land Use and Transportation Element draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead <u>Agency</u>. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Trudi Ryan City of Sunnyvale Community Development Dept. 456 West Olive Avenue PO Box 3707 Sunnyvale, CA 94088

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

The Mugan Scott 4organ

Director, State Clearinghouse

Attachments cc: Lead Agency



JUN 5 2015

PLANNING DIVISION

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044 TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report State Clearinghouse Data Base

SCH# Project Title Lead Agency	2012032003 Land Use and Transportation Element Sunnyvale, City of			
Type	NOP Notice of Preparation			
Description	The proposed project establishes the framework of how the City will be laid out and how various land uses, developments, and transportation facilities will function together. It includes a series of land use and transportation policies, action statements, and strategies that provide direction for how much the City will change and grow between now and 2035, and where the growth will take place. This is a reissued NOP. A previous NOP dated March 2, 2012, was completed for this project under the current SCH #2012032003. This reissued NOP removes the Climate Action Plan (adopted separately) from the proposed project, incorporates numerous changes to the draft LUTE, and establishes a new baseline for environmental and regulatory setting discussions in the forthcoming EIR.			
Lead Agend	ey Contact			
Name Agency Phone email	Trudi Ryan City of Sunnyvale Community Development Dept. 408 730 7435 <i>Fax</i>			
Address	456 West Olive Avenue PO Box 3707			
City	Sunnyvale State CA Zip 94088			
Project Loc	ation			
County	Santa Clara			
City	Sunnyvale			
Region				
Cross Streets	Citywide and Sphere of Influence			
Lat / Long				
Parcel No.				
Township	Range Section Base			
Proximity to)·			
Highways	SR 237_280_85 and US 101			
Airports				
Pailwave				
Matorways	SE Boy various creeks			
Schoole	various occors			
l and lee	All land uses within the planning area including, but not limited to industrial commercial residential			
Lanu USe	park, and open space			
Project Issues	Air Quality; Archaeologic-Historic; Biological Resources; Coastal Zone; Drainage/Absorption; Economics/Jobs; Flood Plain/Flooding; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects; Other Issues; Aesthetic/Visual			
Reviewing Agencies	Resources Agency; Department of Conservation; Department of Parks and Recreation; San Francisco Bay Conservation and Development Commission; Department of Water Resources; Department of Fish and Wildlife, Region 3; Department of Housing and Community Development; Office of Emergency Services, California; Native American Heritage Commission; Caltrans, Division of Aeronautics; Caltrans, Division of Transportation Planning; Caltrans, District 4; Air Resources Board, Transportation Projects; Regional Water Quality Control Board, Region 2			

Document Details Report State Clearinghouse Data Base

Date Received 05/26/2015 Start of Review 05/26/2015 End of Review 06/24/2015

Note: Blanks in data fields result from insufficient information provided by lead agency.

	-	Appendix C				
Notice of Completion & Environmental Do	cument Transmittal					
Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613						
For Hand Delivery/Street Address: 1400 Tenth Street, Sacr	amento, CA 95814	SCH #2012032003				
Project Title- Land Use and Transportation Flement	იადიია					
Lead Agency: City of Sunnyvale	Contest Deve T	udi Duca				
Mailing Address: 456 W. Olive Street, PO BOx 3707	Contact Person: 11001 Ryan					
City: Sunnyvale	Zip: 94088-3707 County: Santa Clara					
000 X(x) 1000 XMM (M)() 1900 X(x) XMM (XX0 XX1 MM (XX1 M)() XX1 MX1 XX1 XX1 XX1 XX1 XX1 XX1 XX1 XX1						
Project Location: County:Santa Clara	City/Nearest Community: Sunnyvale	nana kara kara kwao naki karit kini. Kaki kara kara kara kara				
Cross Streets: N/A Citywide and Sphere of Influence	-	Zip Code: 94085-94089				
Longitude/Latitude (degrees, minutes and seconds):°	″N/°′_″WT	otal Acres: 15,420				
Assessor's Parcel No.:	Section: Twp.: R	ange: Base:				
Within 2 Miles: State Hwy #: <u>SR 237, 280, 85, US 101</u>	Waterways: San Francisco Bay, local	creeks				
Airports: Moffett Fed., San Jose Mineta	Railways: Caltrain So	chools: all schools citywide				
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		The second				
CEQA: X NOP Draft EIR	NEPA: NOI Other:	Joint Document				
Neg Dec (Prior SCH No.) 2012032003	L EA	☐ Final Document				
Mit Neg Dec Other:	□ Dian Els	O				
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Local Action Type:		STATE CI FARME HOUS				
General Plan Update Specific Plan	Rezone					
General Plan Amendment Master Plan	Prezone	Redevelopment				
Community Plan	Use Permit Coastal Permit					
		c.) [_] Other:				
Development Type:	ningan annan an	laya sana anan bata acam taka pang pana kata kata ang ang				
Residential: Units Acres						
Office: Sq.ft Acres Employees	Transportation: Type					
Commercial:Sq.ft Acres Employees	Mining: Mineral					
Educational Sq.it Acres Employees	Power: Type	MW				
Recreational:	Hazardous Waste: Type	MGD				
Water Facilities: Type MGD	Other:					
alar aver 2023 2022 1984 paul paur paur paur aver aver aver aver aver some paur some paur aver aver aver						
Project Issues Discussed in Document:						
X Aesthetic/Visual Fiscal	Recreation/Parks	Vegetation				
Agricultural Land X Flood Plain/Flooding	Schools/Universities	🔀 Water Quality				
X Archeological/Historical X Geologic/Seismic	Septic Systems	X Water Supply/Groundwater				
Biological Resources Minerals	Soil Erosion/Compaction/Grading	K wetland/Kiparian				
🛛 Coastal Zone 🕅 Noise	Solid Waste	X Land Use				
X Drainage/Absorption X Population/Housing Balanc	e 🗙 Toxic/Hazardous	X Cumulative Effects				
X Economic/Jobs X Public Services/Facilities	X Traffic/Circulation	X Other: GHG, Energy Use				
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Print Form

Present Land Use/Zoning/General Plan Designation:

All land uses within the planning area including, but not limited to, industrial, commercial, residential, park, and open space **Project Description**: (please use a separate page if necessary)

The proposed project establishes the '.amework of how the City will be laid out and how various land uses, developments, and transportation facilities will function together. It includes a series of land use and transportation policies, action statements, and strategies that provide direction for how much the City will change and grow between now and 2035, and where the growth will take place. This is a reissued Notice of Preparation (NOP). A previous NOP dated March 2, 2012, was completed for this project under the current SCH #2012032003. This reissued NOP removes the Climate Action Plan (adopted separately) from the proposed project, incorporates numerous changes to the draft LUTE, and establishes a new baseline for environmental and regulatory setting discussions in the forthcoming EIR.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.





June 22, 2015

City of Sunnyvale Planning Division P.O. Box 3707 Sunnyvale, CA 94088-3707

Attention: Trudi Ryan

Subject: Sunnyvale Land Use and Transportation Element (LUTE) Update

Dear Ms. Ryan:

Santa Clara Valley Transportation Authority (VTA) staff have reviewed the NOP for an update to the Land Use and Transportation Element for the City of Sunnyvale. We have the following comments.

Transportation Impact Analysis (TIA) Report

VTA's Congestion Management Program (CMP) requires a Transportation Impact Analysis (TIA) for any project that is expected to generate 100 or more net new peak-hour trips. VTA's understanding is that this General Plan Update does not grant a specific development entitlement and therefore a CMP TIA is not required at this time (per Section 2.2 of the TIA Guidelines). However, as long as a transportation analysis is being prepared for the DEIR, VTA recommends that it be consistent with the TIA Guidelines (see Section 11.2.2).

The October 2014 version of the VTA TIA Guidelines, which can be found at <u>http://www.vta.org/cmp/tia-guidelines</u>, include updated procedures for documenting auto trip reductions, analyzing non-auto modes, and evaluating mitigation measures and improvements to address project impacts and effects on the transportation system. For any questions about the updated TIA Guidelines, please contact Robert Swierk of the VTA Planning and Program Development Division at 408-321-5949 or <u>Robert.Swierk@vta.org</u>.

Transportation Analysis

VTA recommends that the City take a multimodal approach to transportation analysis in the DEIR and TIA. VTA recommends using performance indicators such as vehicle miles travelled (VMT), non-auto mode shares, transit boardings, and air quality emissions, in addition to automobile Level of Service (LOS). The analysis should also address pedestrian, bicycle, and transit facilities in addition to roadways.

City of Sunnyvale June 22, 2015 Page 2

CMP Facilities

Based on the size and location of future development considered in the Land Use and Transportation Element, there may be impacts to one or more CMP facilities, including freeway segments and CMP intersections. If the transportation analysis indicates that there will be significant impacts according to CMP criteria, VTA suggests early coordination with the appropriate agencies to identify potential mitigation measures and voluntary contribution opportunities based on the latest Valley Transportation Plan (VTP) projects in the project area.

Transportation Network and Land Use Assumptions

Please clearly state the City's assumptions regarding the future transportation network and future land uses both inside and outside the City's borders in the horizon year in the DEIR. In particular, the DEIR should identify any areas where the transportation network assumptions (including freeways, expressways, arterials, and transit network) diverge from the Valley Transportation Plan (VTP) 2040 financially constrained project list. If the City is introducing changes from the VTP 2040 network, we believe it is important to understand the effects on the City's transportation system as well as Congestion Management Program (CMP) facilities, of including and not including these projects. For land use assumptions, please clearly state how the General Plan buildout figures for population, households and jobs compare to ABAG's Projections 2013 assumptions both in Sunnyvale and in neighboring cities.

Consistency with VTA Travel Demand Model

VTA recommends that the City refer to the VTA CMP *Local Transportation Model Consistency Guidelines* prior to developing the Transportation analysis for this DEIR. This document, which includes the local model consistency guidelines and the local model evaluation and acceptance procedure, may be downloaded from <u>http://www.vta.org/cmp/technical-guidelines</u>. We recommend that the City coordinate with VTA modeling staff early in the EIR process to discuss the application of the local model and specific local assumptions. We are happy to assist with this coordination; please contact the head of our modeling group, Transportation Planning Manager George Naylor, at (408) 321-5763, for more information.

Impacts on Transit Travel Times

The Transportation analysis in the DEIR should address any potential impacts that increased motor vehicle traffic and congestion associated with the General Plan build-out may have on bus travel times, particularly in the El Camino Real corridor. Adopting transit priority measures such as transit-only lanes and queue jump lanes, and continuing to provide transit signal priority can help mitigate any impacts that may occur, and we encourage the City to include policies supporting these types of measures. Such measures allow transit vehicles to move through congestion and improve time competitiveness compared to the automobile, an important element

City of Sunnyvale June 22, 2015 Page 3

in shifting mode share from the automobile to achieve the greenhouse gas reduction goals envisioned in the adopted Sunnyvale Climate Action Plan (CAP).

Thank you for the opportunity to review this project. If you have any questions, please call me at (408) 321-5784.

Sincerely,

Roy Molseed Senior Environmental Planner

cc: Patricia Maurice, Caltrans Brian Brandert, Caltrans

SU1507

PLANNING DIVISION CITY OF SUNNYVALE P.O. BOX 3707 SUNNYVALE, CA 94088-3707

NOTICE OF PREPARATION

TO: Responsible, Trustee, and Other Interested Public Agencies FROM: City of Sunnyvale Community Development 456 West Olive Avenue P.O. Box 3707 Sunnyvale, CA 94088-3707

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

The City of Sunnyvale will be the lead agency and will prepare an environmental impact report (EIR) for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by the City when considering your permit or other approval for the project. The project description, location, and the probable environmental effects are contained in the attached materials.

Due to the time limits mandated by state law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. Please send your response to Gerri Caruso at the address shown above. We will need the name for a contact person in your agency.

A scoping meeting will be held on March 22, 2012 at 7:00 PM at City Council Chambers in the Sunnyvale City Hall, located at 456 West Olive Avenue in the City of Sunnyvale.

Project Title:	Sunnyvale Land Use and Transportation Element (LUTE) Update and Climate
	Action Plan (CAP)

Project Applicant: City of Sunnyvale, Gerri Caruso, (408) 730-7591

Project Description: The proposed LUTE update establishes the fundamental framework of how the city will be laid out (streets and buildings) and how various land uses, developments, and transportation facilities will function together. The LUTE includes a series of land use and transportation policies, action statements, and strategies that provide direction for how much the city will change and grow between now and the City's planning horizon of year 2035, and where the growth will take place.

The CAP serves as a guiding document to identify ways in which the community and City can reduce greenhouse gas emissions and adapt to the effects of climate change. The CAP addresses long-term goals of emissions reduction and sets reduction targets for the City. The CAP provides measures that will help reach these reduction targets and achieve consistency with the state's Global Warming Solutions Act (AB 32).

Date: March 2, 2012

Signature:

Gerri Caruso Title: Principal Planner Telephone: (408) 730-7591 E-Mail: <u>GCaruso@ci.sunnyvale.ca.us</u>

1.0 INTRODUCTION

The purpose of an EIR is to inform decision-makers and the general public of the environmental effects of a proposed project. The EIR process is intended to provide public agencies with the environmental information required to evaluate a proposed project, establish methods for reducing adverse environmental impacts, and consider alternatives to a project prior to the approval of the project.

The EIR for the City of Sunnyvale's LUTE update and CAP will be prepared and processed in accordance with the California Environmental Quality Act (CEQA). In accordance with the requirements of CEQA, the EIR will include:

- A summary of the EIR;
- A project description;
- A description of the existing environmental setting, potential environmental impacts, and mitigation measures;
- Alternatives to the project as proposed;
- Environmental consequences, including (1) any significant environmental effects which cannot be avoided if the project is implemented, (2) the growth-inducing impacts of the proposed project, (3) effects found not to be significant, and (4) cumulative impacts.

2.0 PROJECT LOCATION

The City of Sunnyvale is located in the flatlands of northwest Santa Clara Valley, generally between Calabazas Creek on the east and Stevens Creek on the west, and between the San Francisco Bay on the north and Homestead Road on the south (see Figure 1). The city encompasses approximately 23 square miles and is almost entirely surrounded by the cities of Los Altos, Mountain View, Cupertino, and Santa Clara (see Figure 2).

3.0 DESCRIPTION OF THE PROJECT

Land Use and Transportation Element Update (LUTE)

The LUTE update of the City of Sunnyvale General Plan establishes the fundamental framework of how the city will be laid out (streets and buildings) and how various land uses, developments, and transportation facilities will function together. The LUTE update includes a series of land use and transportation policies, action statements, and strategies that provide direction for how much the city will change and grow, and where the growth will take place.

The LUTE update has been developed to help guide the City's land use and transportation decisions for an approximate 25-year horizon—a time frame referred to as *Horizon 2035*. This growth scenario includes additional mixed-use residential/commercial growth in key transit-oriented areas and in transformed village centers. Areas for additional business (or industrial) growth are also identified. See Figure 3 for the proposed land uses under the LUTE.

The 2035 buildout scenario represents the following potential changes from existing conditions:

Comparison – 2010 to Horizon 2035

	2010 Existing Conditions	Horizon 2035
Population	141,000	174,600
Housing Units	55,400	72,160
Industrial/Office/Commercial (million square feet)	46.7	63.1
Jobs	77,890	132,000
Jobs to Housing Units Ratio	1.41	1.83

In general, the transportation policies guide how the roadways and streets will function and how space on the roadways will be utilized by multiple modes of transportation with attention to the pedestrian and bicycle network. Policies in the land use and transportation sections address preserving community qualities that are favorable to the residents and businesses and which contribute to the city's unique identity. Policies also provide guidance on the visual quality and character of new development.

The LUTE update contains policy direction on the following topics:

- **Complete Community** Creating a sustainable end-state that represents a place to live that is less dependent on automobiles, with distinctive village centers and neighborhoods that have access to close services.
- **Coordinated Regional and Local Planning** Preserving home rule, securing fair share of funding and providing leadership in the region, and protecting the quality of life, the natural environment, and property investment.
- Environmental Sustainability Supporting the sustainable vision by incorporating sustainable features into land use and transportation decisions and practices.
- **Multimodal Transportation** Offering the community a variety of transportation modes for local travel that are also integrated with the regional transportation system and land use pattern. Favoring accommodation of alternative modes to the automobile as a means to enhance efficient transit, bicycling, and walking and corresponding benefits to the environment, person-throughput, and qualitative improvements to the transportation system environment.
- Attractive Community In combination with the City's Community Design Sub-Element, assuring that all areas of the city are attractive and that the city's image is enhanced by following policies and principles of good urban design while valued elements of the community fabric are preserved.
- Village Centers Supporting the development of village centers that create an identity and —snse of place" for residential neighborhoods, provide for neighborhood gathering places, and allow for a vibrant mix of public, commercial, and residential activities. Through the development review process and other permitting processes, assuring that adequate protection is provided to residential neighborhoods when new uses and development projects are considered.
- Neighborhood Preservation Assuring that all residential areas of the city are maintained, that neighborhoods are protected, and that residential character is strengthened, retained, and enhanced through urban design.

- **Diverse Housing Opportunities** Ensuring ownership and rental housing options with a variety of dwelling types, sizes, and densities that contribute positively to the surrounding area and to the health of the community.
- **Options for Healthy Living** Creating a city development pattern and improving the city's infrastructure in order to maximize healthy choices for all, including physical activity, use of the outdoors, and access to fresh food.
- **Economic Development** Creating an economic development environment that is supportive of a wide variety of businesses and promotes a strong economy within existing environmental, social, fiscal, and land use constraints.
- **Balanced Economic Base** Creating a balanced economic base that can resist downturns of any one industry and provide revenue for city services.
- **Protected, Maintained, and Enhanced Businesses** Achieving attractive commercial centers and business districts and buildings that are maintained and to allow a full spectrum of businesses that operate unencumbered.
- Special and Unique Land Uses Providing land use and design guidance so that special and unique areas and land uses can fulfill their distinctive purposes and provide a diverse and complete community fabric.

Climate Action Plan (CAP)

The CAP serves as a guiding document to identify ways in which the community and the City can reduce greenhouse gas (GHG) emissions and adapt to the effects of climate change. The CAP addresses long-term goals of emissions reduction and sets reduction targets for the City. The CAP provides measures that will help achieve these reduction targets and achieve consistency with the state's Global Warming Solutions Act (AB 32).

The CAP sets out specific prioritized measures to be utilized to achieve GHG emissions reductions. The land use and transportation policies of the General Plan call for maintaining a CAP and for regional participation in climate change adaptation strategies. The CAP supports the LUTE update by establishing specific measures that put the City in a regional leadership role regarding GHG emissions reduction.

The CAP is intended to streamline future environmental review of development projects in the city by following the CEQA Guidelines (e.g., Section 15183.5) and meeting the Bay Area Air Quality Management District's (BAAQMD) expectations for a Qualified GHG Reduction Strategy. The CAP identifies how the City will achieve the state-recommended GHG emissions reduction target of 15 percent below 2008 levels by the year 2020 (equivalent to 1990 emissions). The CAP provides goals and associated measures, also referred to as reduction measures, in the sectors of energy use, transportation, land use, water, solid waste, and off-road equipment.

4.0 POTENTIAL ENVIRONMENTAL EFFECTS OF THE PROJECT

The EIR will analyze the environmental impacts of the implementation of the proposed LUTE update and CAP.

The EIR will address the following environmental issues: land use, population/housing/employment, human health and risk of upset, transportation, air quality, noise, geology and soils, hydrology and water quality, biological resources, cultural resources, utilities and service systems, visual and aesthetics, energy use and climate change, cumulative impacts, and growth-inducing impacts. Implementation of the proposed LUTE update and CAP was found to have no potential to create impacts on agricultural resources or mineral resources. A brief discussion of the anticipated environmental impacts is presented below.

Land Use: The EIR will address the issue of consistency and compatibility of the proposed land use and transportation changes and policies resulting from the implementation of the proposed LUTE update and CAP in relation to physical effects on the environment.

Population/Housing/Employment: The EIR will analyze the potential changes in population, housing, and employment within the city resulting from implementation of the proposed LUTE update and CAP, and whether those changes would result in physical effects on the environment (e.g., division of an established community).

Human Health and Risk of Upset: The EIR will describe the existing conditions within the city, including the potential for existing soil and groundwater contamination to impact future uses. Any existing or potential hazards or hazardous waste generators in the city will be discussed and any federal, state, or local legislation concerning hazards and hazardous material handling, transport, etc., will be identified.

Transportation: Continued growth both within the city and in surrounding communities will increase the amount of traffic experienced within the city. A traffic analysis will be conducted and its results analyzed in the Draft EIR. The traffic analysis will evaluate existing and long-term impacts of implementation of the proposed LUTE update and CAP on roadway systems in the city and in adjacent jurisdictions.

Air Quality: The EIR will describe the regional air quality conditions in the San Francisco Bay Area and will address air quality impacts expected to result from the implementation of the proposed LUTE update and CAP in conformance with the criteria identified by the BAAQMD. Impacts from construction-related activities, as well as operational air quality impacts, toxic air contaminant exposure, and consistency with air quality improvement plans will be addressed.

Noise: The EIR will discuss the existing noise setting and will evaluate the stationary and traffic-related noise impacts associated with implementation of the proposed LUTE update and CAP.

Geology and Soils: The EIR will describe the city's geologic and seismic setting and will address the impacts associated with the implementation of the proposed LUTE update and CAP.

Hydrology and Water Quality: The EIR will analyze the issues concerning hydrology and water quality, including the existing storm drain system serving the city, the city's water providers, future availability of water, flood hazards, and groundwater quality. Water quality impacts and conformance with the Santa Clara Valley Urban Runoff Pollution Prevention Program, other Regional Water Quality Control Board requirements, and the Water Resources Sub-Element of the Sunnyvale General Plan will be addressed.

Biological Resources: The EIR will evaluate the biological conditions within the city and the impacts of the implementation of the proposed LUTE update and CAP. The EIR will address the presence/absence of special-status plant and animal species and sensitive habitats within the city.

Cultural Resources: The EIR will describe the potential for cultural and historic resources to be present within the city and the project's potential to impact those resources.

Utilities and Service Systems: The EIR will describe the city's existing utilities and public services and will analyze the impacts of the implementation of the proposed LUTE update and CAP on public utilities and services, including sanitary sewer, storm drains, water supply, and solid waste.

Visual and Aesthetics: The EIR will examine the impacts of the implementation of the proposed LUTE update and CAP on the visual character and quality of the city related to urban form, building design, commercial signage, and other factors.

Energy Use and Climate Change: The EIR will examine the potential for excessive or inefficient use of energy resulting from the implementation of the proposed LUTE update and CAP and will discuss the project's energy conservation measures. The EIR will also assess the CAP's ability to address increases in GHG emissions as well as the environmental effects of climate change on the city (e.g., sea level rise).

Cumulative Impacts: The EIR will address the potentially significant cumulative impacts of the implementation of the proposed LUTE update and CAP when considered with other past, present, and reasonably foreseeable future projects in the area.

Growth-Inducing Impacts: The EIR will discuss the ways in which the implementation of the proposed LUTE update and CAP could foster growth in the surrounding environment and the types of growth that could result.



PMC




Proposed Land Uses \mathbf{PMC}^{*}

Gerri Caruso - Re: City of Sunnyvale Public Meeting Notice- Public Agencies

From:	Mark Connolly <mark.connolly@pln.sccgov.org></mark.connolly@pln.sccgov.org>
To:	"Gerri Caruso" <gcaruso@ci.sunnyvale.ca.us></gcaruso@ci.sunnyvale.ca.us>
Date:	2/27/2012 12:09 PM
Subject:	Re: City of Sunnyvale Public Meeting Notice- Public Agencies
CC:	Trudi Ryan <tryan@ci.sunnyvale.ca.us></tryan@ci.sunnyvale.ca.us>

Hi Gerri-

I will just re-state what we have already been in discussions about, which is the new update should include the Moffett CLUP Amendment. I will likely not come to any of the public comment workshops unless asked to attend by City Staff, but am happy to review anything you have thus far and throughout the Update process.

Thank you,

Mark J Connolly Planner III / ALUC Staff County of Santa Clara Planning Division 70 W. HeddingStreet San Jose, CA 95110 Direct: 408-299-5786 Fax: 408-288-9198 E-mail: mark.connolly@pln.sccgov.org

On Feb 25, 2012, at 11:34 AM, Gerri Caruso wrote:

The City of Sunnyvale is holding three public outreach meetings in March to present and take comments on the new Land Use and Transportation Chapter of the General Plan (LUTE) and on the City's First Climate Action Plan (CAP). The content of each meeting will be the same. Please see the attached flyer for meeting locations and time. The draft LUTE and CAP are available for review online at www.Horizon2035.inSunnyvale.com

If you have any questions, please contact me at (408) 730-7591 or at gcaruso@ci.sunnyvale.ca.us

Regards

Gerri Caruso Principal Planner <Flyer CDD - LUTE CAP Outreach 2-17-12.pdf>

County of Santa Clara

Roads and Airports Department

101 Skyport Drive San Jose, California 95110-1302 (408) 573-2400

March 29, 2012

Ms. Gerri Caruso Principal Planner Community Development Department 456 West Olive Avenue Sunnyvale, California 94088-3707

APR 04 2012

PLANNING DIVISION

Notice of Preparation of a Draft Environmental Impact Report for the Sunnyvale Land Use and Subject: Transportation Element (LUTE) Update and Climate Action Plan (CAP)

Dear Ms. Caruso:

We have received and reviewed your Notice of Preparation of a Draft Environmental Impact Report (EIR) for the above referenced project, and the following are our comments:

- 1. The Draft EIR should analyze impacts on Central, Lawrence, Foothill, San Tomas, and Montague Expressways both within and outside of the City using the latest Congestion Management Program (CMP) approved guidelines for the analysis and referencing the Comprehensive County Expressway Planning Study, 2008 Update, as a minimum for improvement measures.
- 2. The EIR should identify mitigation measures to address impacts on the County's facilities. Mitigation measures should be consistent with the County Expressway Study - 2008 update.
- 3. If the City's development projects will contribute to County's facilities being deficient, then the City is responsible for drafting Deficiency Plan reports per the Congestion Management Agency (CMA) Deficiency Plan Guidelines.

Thank you for the opportunity to review and comment on Notice of Preparation. If you have any questions, please call me at (408) 573-2450.

Sincerely,

David R.L. Boyd

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cc: MA, Dawn Cameron Manager and the second states of the second states



March 30, 2012

City of Sunnyvale Planning Division P.O. Box 3707 Sunnyvale, CA 94088-3707

Attention: Gerri Caruso

Subject: Sunnyvale Land Use and Transportation Element Update and Climate Action Plan

Dear Ms. Caruso:

The Santa Clara Valley Transportation Authority (VTA) has reviewed the March 2, 2012 NOP for a Draft EIR for the Sunnyvale Land Use and Transportation Element (LUTE) Update and Climate Action Plan (CAP), as well as the Draft LUTE and Draft CAP documents posted to <u>http://www.pmcworld.com/client/sunnyvale/index.html</u> in December, 2011. From our review of the NOP and draft documents we have the following comments:

NOP - Transportation Analysis in the DEIR

Under the "Transportation" section of "Potential Environmental Effects of the Project" (pg. 5), the NOP only discusses a traffic analysis of roadways in Sunnyvale and surrounding jurisdictions. Consistent with recent updates to statewide CEQA guidelines, VTA recommends that the City take a multimodal approach to transportation analysis. VTA recommends using performance indicators such as VMT per capita, non-auto mode shares, transit boardings, and air quality emissions, in addition to automobile LOS. The analysis should also address pedestrian, bicycle, and transit facilities in addition to roadways.

NOP - Transportation Network and Land Use Assumptions

Please clearly state the City's assumptions regarding the future transportation network and future land uses both inside and outside the City's borders in the horizon year in the DEIR. In particular, the DEIR should identify any areas where the transportation network assumptions (including freeways, expressways, arterials, and transit network) diverge from the Valley Transportation Plan (VTP) 2035 financially constrained project list. If the City is introducing changes from the VTP 2035 network, we believe it is important to understand the effects on the City's transportation system as well as Congestion Management Program (CMP) facilities, of including and not including these projects. For land use assumptions, please clearly state how the General Plan buildout figures for population, households and jobs compare to ABAG's Projections 2009 assumptions both in Sunnyvale and in neighboring cities.

NOP - Consistency with VTA Travel Demand Model

VTA recommends that the City refer to the VTA CMP Local Transportation Model Consistency Guidelines prior to developing the Transportation analysis for this DEIR. This document, which includes the local model consistency guidelines and the local model evaluation and acceptance

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City of Sunnyvale March 30, 2012 Page 2

procedure, may be downloaded from <u>http://www.vta.org/news/vtacmp/0 - CMP Technical</u> <u>Guidelines 2012/</u>. We recommend that the City coordinate with VTA modeling staff early in the EIR process to discuss the application of the local model and specific local assumptions. We are happy to assist with this coordination; please contact the head of our modeling group, Transportation Planning Manager George Naylor, at (408) 321-5763 for more information. 77

NOP - Impacts on Transit Bus Travel Times

The Transportation analysis in the DEIR should address any potential impacts that increased motor vehicle traffic and congestion associated with the General Plan build-out may have on bus travel times, particularly in the El Camino Real corridor. Adopting transit priority measures such as transit-only lanes and queue jump lanes, and continuing to provide transit signal priority can help mitigate any impacts that may occur, and we encourage the City to include policies supporting these types of measures. Such measures allow transit vehicles to move through congestion and improve time competitiveness compared to the automobile, an important element in shifting mode share from the automobile to achieve the greenhouse gas reduction goals envisioned in the Draft Sunnyvale Climate Action Plan (CAP).

Draft LUTE - Bicycle Standards

Policy 4, Action 4 reads, "Partner with cities in the region to prevent and eliminate borders by using the VTA Bicycle Standards." VTA would prefer that this action reference the VTA Bicycle Technical Guidelines and the Santa Clara Countywide Bicycle Plan. These documents may be downloaded from <u>http://www.vta.org/bike_information/index.html</u>. For more information on bicycle systems and parking, please contact Michelle DeRobertis of VTA's Congestion Management Agency Division at (408) 321-5716.

Draft LUTE - Transit Priority and Bus Rapid Transit

Policy 23 gives an "order of consideration of transportation users" on city streets in the following order: 1) Pedestrians, 2) Non-automotive: such as bikes, three-wheeled bikes, scooters etc., 3) Mass transit vehicles, 4) Delivery vehicles, 5) The single occupant automobile. While VTA supports the intention of this policy, we are concerned that it does not allow flexibility for the prioritization to vary based on the needs of different streets. In particular, we would like to see some streets given a "transit first" priority, as done in San Jose's Envision 2040 Plan (See Draft EIR, pg. 5-27, "Grand Boulevards" section). As is, the current prioritization could be problematic for implementation of Bus Rapid Transit and other transit priority measures in targeted areas.

Policy 43, Action 3 reads, "Monitor and participate in planning and implementation of the Grand Boulevard Initiative and Bus Rapid Transit (BRT) on El Camino Real to assure that local Sunnyvale interests such as a quality streetscape, bicycle facilities, and pedestrian facility enhancements are incorporated, and capacity for transit does not sacrifice safety and service for other travel modes." VTA agrees that safety should not be sacrificed, but has concerns that the emphasis on "service for other travel modes" could jeopardize the implementation of transit priority measures along El Camino Real. VTA notes that some cases require trade-offs to prioritize one mode over others, and would like to see El Camino Real indicated as a "transit City of Sunnyvale March 30, 2012 Page 3

first" street in order to meet Sunnyvale and regional needs for high quality rapid transit in this corridor.

Draft LUTE - Parking Policy

Policy 27, Action 1 reads, "Pursue opportunities for user fees such as paid parking, paid parking permits at workplaces, paid parking places for on street parking in residential neighborhoods, and promote corporate parking cash out programs." VTA supports this policy and suggests adding "unbundling of residential parking from the price of residences" to the list.

Draft LUTE and Draft CAP - VMT and GHG Reduction

While Draft CAP contains commendable goals and policies regarding reduction of Vehicle Miles Traveled (VMT) and Greenhouse Gas Emissions (GHG), VTA notes that there are no such goals or policies in the Draft LUTE. We believe that the Sunnyvale General Plan, as the City's basic guide to development over the next 25 years, should also explicitly state goals and policies to shift mode share from the single occupant automobile to more sustainable modes of transportation.

Thank you for the opportunity to review this project. If you have any questions, please call me at (408) 321-5784.

Sincerely,

Roy Molseed Senior Environmental Planner

SU0901

April 2, 2012

Gerri Caruso, Principal Planner City of Sunnyvale Department of Community Development 456 West Olive Avenue P.O. Box 3707 Sunnyvale, CA 94088-3707

Dear Ms. Caruso,

Thank you for the opportunity to comment on the Notice of Preparation for the EIR for the Sunnyvale Land Use and Transportation Element (LUTE) Update and Climate Action Plan (CAP). We have two recommendations for the City as it prepares the EIR for the update to the Sunnyvale General Plan.

- 1. Analyze an additional alternative that includes increased residential development totals and higher densities than the proposed LUTE update.
- 2. Analyze an alternative that reduces per capita greenhouse gas (GHG) emissions by 2020 to 7% below 1990 levels consistent with the Mayors' Climate Protection Agreement, which was unanimously adopted by Sunnyvale City Council on September 11, 2007.

Recommendation 1: Analyze an additional alternative that includes increased residential development totals and higher densities than the proposed LUTE update.

The purpose of this alternative is to understand the environmental impact of increased housing, including the sensitivity of GHG emissions to population totals.

In 2008, California passed SB 375, which requires that Regional Transportation Plans include a "Sustainable Communities Strategy" to meet GHG reduction targets from vehicle travel as set by the California Air Resources Board. Because land use decisions are made at the local level, individual cities play a significant role in reaching the region's SB375 targets. Transportation accounts for 35% of Sunnyvale's GHG emissions, according to the draft CAP.

Despite the increase in allowed densities in key transit-oriented areas and in transformed village centers, the proposed LUTE update will still not allow for enough housing growth between now and 2035 to close the gap between projected numbers of population and jobs. This imbalance means that many Sunnyvale employees will continue to have to live outside Sunnyvale and commute each day. This will result in increased GHG emissions at a regional level. It will also contribute to congestion on local streets, especially at peak commute hours.

The California Attorney General's comment letter on the City of Pleasanton's General Plan DEIR¹ references the need to study alternatives that improve the jobs/housing balance:

The DEIR examines only three alternatives to the proposed General Plan Update, none of which consider significantly reducing business development or **significantly increasing residential development**. CEQA requires a local agency to identify and study a reasonable range of alternatives that would attain most of the basic objectives of the project. The fundamental purpose of alternatives

¹ http://oag.ca.gov/sites/all/files/pdfs/environment/comments_Pleasanton_GP.pdf

analysis is to examine alternatives that can eliminate or reduce significant environmental impacts. An EIR must meaningfully compare the alternatives as they contribute to global warming and an EIR should compare the alternatives' greenhouse gas emissions. Further, **the differences in greenhouse** gas emissions associated with the various alternatives should figure into the lead agency's identification of the "environmentally superior alternative." [emphasis added]

Recommendation 2: Analyze an alternative that reduces per capita greenhouse gas emissions by 2020 to 7% below 1990 levels consistent with the Mayors' Climate Protection Agreement, which was unanimously adopted by Sunnyvale City Council on September 11, 2007.

The proposed LUTE update and CAP establish a pathway toward achieving minimal compliance with California law, AB 32, which mandates reducing per capita GHG emissions to 1990 levels by 2020. However, on September 11, 2007, Council agreed to a more ambitious goal when unanimously adopting the Mayors' Climate Protection Agreement² as official City policy. This agreement committed Sunnyvale to striving to reduce GHG emissions 7% *below* 1990 levels. Since the proposed plan does not achieve the Sunnyvale goal, and since Sunnyvale aspires to environmental leadership, we request that the EIR examine an alternative that does meet the goal. Further, we request the EIR show how a 7% reduction of GHG emissions could be achieved.

Sincerely,

Gustav Larsson Sunnyvale resident

Sue Harrison Sunnyvale resident

Gerald Glaser Sunnyvale resident

Margaret Okuzumi Sunnyvale resident

Ursula Syrova Sunnyvale resident

Barbara Fukumoto Sunnyvale resident

² http://www.usmayors.org/climateprotection/documents/mcpAgreement.pdf



Making San Francisco Bay Better

APR 0 4 2012

PLANNING DIVISION April 2, 2012

Gerri Caruso City of Sunnyvale Community Development Dept. 456 West Olive Avenue Sunnyvale, CA 94088

SUBJECT: BCDC Inquiry File MC.MC.8704.1, Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Land Use and Transportation Element (LUTE) and Climate Action Plan (CAP) (SCH #2012032003)

Dear Gerri Caruso:

Thank you for the opportunity to comment on the Notice of Preparation dated March 2, 2012, and received in our office on March 6, 2012. These staff comments are based on the San Francisco Bay Conservation and Development Commission (BCDC) laws and policies, the McAteer-Petris Act, and the provisions of the *San Francisco Bay Plan* (Bay Plan). In particular, these comments are related to BCDC jurisdiction, bay fill, public access, fish, other organisms and wildlife, transportation, shoreline protection and climate change.

Jurisdiction and Authority. BCDC is responsible for granting or denying permits for any proposed fill (earth or any other substance or material, including pilings or structures placed on pilings, and floating structures moored for extended periods), extraction of materials or change in use of any water, land or structure within the Commission's jurisdiction. Generally, BCDC's jurisdiction over San Francisco Bay includes tidal areas up to the mean high tide level, including all sloughs, and in marshlands up to five feet above mean sea level; a shoreline band consisting of territory located between the shoreline of the Bay and 100 feet landward and parallel to the shoreline; salt ponds; managed wetlands (areas diked from the Bay and managed as duck clubs); and certain waterways tributary to the Bay.

The Commission can grant a permit for a project if it finds that the project is either (1) necessary to the health, safety or welfare of the public in the entire Bay Area, or (2) is consistent with the provisions of the McAteer-Petris Act and the Bay Plan. The McAteer-Petris Act provides for fill in the Bay for water-oriented uses where there is no alternative upland location and requires that any fill that is placed in the Bay is the minimum that is necessary for the project. The McAteer-Petris Act also requires that proposed projects include the maximum feasible public access consistent with the project to the Bay and its shoreline.

Projects approved by BCDC must also be consistent with the Bay Plan. The Bay Plan includes priority land use designations to ensure that sufficient lands around the Bay shoreline are reserved for important water-oriented uses such as ports, airports, water-related industry, parks, and wildlife areas. The Bay Plan also includes policies that address protecting the Bay as a resource, and provide for the wise use and development of the Bay and its shoreline. Gerri Caruso April 2, 2012 Page 2

The attached Bay Plan Map 7 depicts the Don Edwards Wildlife Refuge which is a designated wildlife refuge in the Bay Plan which is located in the vicinity of Sunnyvale.

Public Access and Bay Fill. Section 66602 of the McAteer-Petris Act states, in part, that "existing public access to the shoreline and waters of the San Francisco Bay is inadequate and that maximum feasible public access, consistent with a proposed project, should be provided."

Bay Plan policies require that public access be designed and maintained to avoid flood damage due to sea level rise and storms. Any public access provided as a condition of development must either remain viable in the event of future sea level rise or flooding, or equivalent access consistent with the project must be provided nearby. As there are biological resources along the shoreline, the Draft EIR should also consider the Bay Plan policies that aim to maximize public access opportunities while minimizing significant adverse impacts upon wildlife.

If any projects identified in the Draft EIR may require bay fill or new shoreline development within BCDC's jurisdiction, then the Draft EIR should consider that BCDC policies on filling allow for fill to be placed in the Bay to protect existing and planned development from flooding as well as erosion. However, new projects on fill that are likely to be affected by future sea level rise and storm activity during the life of the project must: be set back from the shoreline to avoid flooding; be elevated above expected flood elevations; be designed to tolerate flooding or employ other means of addressing flood risks.

Fish, **Other Aquatic Organisms and Wildlife**. If the projects identified in the DEIR would have impacts upon biological resources, then the DEIR should discuss the relevant policies on Fish, Other Aquatic Organisms and Wildlife which state, in part, "To assure the benefits of fish, other aquatic organisms and wildlife for future generations, to the greatest extent feasible, the Bay's tidal marshes, tidal flats, and subtidal habitat should be conserved, restored and increased." Project elements that could impact biological resources could include elements that entail bay filling with BCDC jurisdiction.

Transportation and Land Use. As the NOP is focused on the update of the Transportation and Land Use element it should consider the transportation policies in the Bay Plan. Because of the continuing vulnerability of the Bay to filling for transportation and development projects, the transportation findings of the Bay Plan state, in part, "pressure to fill the Bay for surface transportation projects can be reduced by improving the efficiency and increasing the capacity of existing transportation facilities and services, increasing access to public transit, providing safe and convenient public pathways for non-motorized forms of travel (e.g. bicycles, pedestrian)" and "transportation projects should be designed to maintain and enhance visual and physical access to the Bay and along the Bay shoreline." Furthermore, Bay Plan policies state, in part, "Transportation projects along the Bay shoreline and bridges over the Bay or certain waterways should include pedestrian and bicycle paths that will either be a part of the Bay Trail or connect the Bay Trail with other regional and community trails.

Climate Change, Shoreline Protection and Safety of Fills. The City of Sunnyvale should be applauded for developing a Climate Action Plan that aims to reduce greenhouse gas emissions and allows the City to adapt to effects of climate change.

The Commission recently amended the Bay Plan Tidal Marsh and Tidal Flats, Shoreline Protection, Public Access, Safety of Fills policies and added a new Climate Change policy section. Sea level risk assessments are required when planning shoreline areas or designing larger shoreline projects. Risk assessments are not required for repairs of existing facilities, interim projects, small projects or infill projects. Gerri Caruso April 2, 2012 Page 3

If the DEIR envisions the needs for shoreline protection then the DEIR should consider the Bay Plan policies that require shoreline protection, such as levees and seawalls, to be designed to withstand the effects of projected sea level rise and to be integrated with adjacent shoreline protection. Whenever feasible, projects must integrate hard shoreline protection structures with natural features that enhance the Bay ecosystem, e.g., by including marsh or upland vegetation in the design. Where it is feasible, ecosystem restoration projects must be designed to provide space for marsh migration as sea level rises.

The Bay Plan policies on Safety of Fills state, in part, "rights-of-way for levees or other structures protecting inland areas from tidal flooding should be sufficiently wide on the upland side to allow for future levee widening to support additional levee height so that no fill for levee widening is placed in the Bay."

Thank you for the opportunity to comment on the Notice of Preparation. If you have any questions regarding this letter please contact me directly at (415) 352-3667 or by e-mail at timd@bcdc.ca.gov.

Sincerely,

TIMOTHY DOHERTY Coastal Program Analyst

Enc. TD/rca



San Francisco Bay Plan Reprinted March 2012

Gerri Caruso - additional LUTE/CAP EIR commen tspp

From:Martin Landzaat <martin_landzaat@hotmail.com>To:Gerri Caruso <gcaruso@ci.sunnyvale.ca.us>Date:4/2/2012 4:39 PMSubject:additional LUTE/CAP EIR commen tsbp

Hi Gerri,

I have the following additional comments:

Parks:

Sunnyvale has a fantastic Parks and Recreation system, please discuss the impacts on the parks and recreation facilities that growth will have. Also discuss ways to mitigate the impacts on existing parks/facilities. Provide a plan for the expansion of parks and recreation facilities based on expected revenues generated by Sunnyvale's park dedication fees.

Economics

Please include a breakdown on the amount of rental vs. owner occupied properties expected to be build. Determine if rental and owner occupied properties will use more city/school-district services than they pay for. I know of several large apartment complexes in my neighborhood that have not been reassessed since 1977 and have very low property tax assessments due to Prop. 13.

Martin Landzaat 562 Carlisle Way

Gerri Caruso - LUTE/CAP E IR commentsþ

From:Martin Landzaat <martin_landzaat@hotmail.com>To:Gerri Caruso <gcaruso@ci.sunnyvale.ca.us>Date:4/1/2012 9:41 PMSubject:LUTE/CAP E IR commentsp

Hi Gerri,

Here are my comments:

Public Schools

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Please include data on how the projected growth will affect the neighborhood schools based on today's school attendance boundaries.

My local elementary school is Stocklmeir Elementary (592 Dunholme Ave). Stocklmeir Elementary currently has 1100+ students and is the largest elementary school in the area. Stockmeir's attendance boundaries include

census tracts 508203, 508204, and approximately 2/3rd of 508503 (*projects.nytimes.com/census/2010/map*). Using 2010 census data, Stockmeir serves a population of approximately 13660 people. How will this increase with Sunnyvale's projected growth. Compare and contrast the school's attendance area size with neighboring communities. Use school district demographic reports as a baseline for estimating future school population. Provide strategies for relieving over crowded schools.

*

Currently Sunnyvale has one public High School (Fremont High 1279 Sunnyvale Saratoga Road) within its city limits. Please include a discussion on the Sunnyvale High school site (562 N Britton Avenue) and how the decision by the Fremont Union High School District to lease that site to The King's Academy (http://www.tka.org/uploaded/About_Us/Documents/25_Year_Lease.pdf) will affect other high schools.

Martin Landzaat 562 Carlisle Way Sunnyvale, CA

DEPARTMENT OF TRANSPORTATION

111 GRAND AVENUE P. O. BOX 23660 OAKLAND, CA 94623-0660 PHONE (510) 286-5541 FAX (510) 286-5559 TTY 711

RECENED



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APR 05 2012

April 2, 2012

PLANNING DIVISION

SCLVAR034 SCH#2012032003

Ms. Gerri Caruso City of Sunnyvale Community Development 456 West Olive Avenue P.O. Box 3707 Sunnyvale, CA 94088-3707

Dear Ms. Caruso:

Sunnyvale Land Use Transportation Element Update and Climate Action Plan—Notice of Preparation

Thank you for including the California Department of Transportation (Department) in the environmental review process for the project referenced above. As the lead agency, the City of Sunnyvale is responsible for all project mitigation, including any needed improvements to State highways. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures. This information should also be presented in the Mitigation Monitoring and Reporting Plan of the environmental document.

Traffic Impact Study

One of the Department's ongoing responsibilities is to collaborate with local agencies to avoid, eliminate, or reduce to insignificance potential adverse impacts by local development on State highways. We recommend using the Department's *Guide for the Preparation of Traffic Impact Studies (TIS Guide)* for determining which scenarios and methodologies to use in the analysis. The *TIS Guide* is a starting point for collaboration between the lead agency and the Department in determining when a TIS is needed. The appropriate level of study is determined by the particulars of a project, the prevailing highway conditions, and the forecasted traffic. The *TIS Guide* is available at the following website address:

http://dot.ca.gov/hg/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf

The TIS should include:

- 1. Vicinity map, regional location map, and a site plan clearly showing project access in relation
- to nearby State roadways. Ingress and egress for all project components should be clearly
- identified. The State right-of-way (ROW) should be clearly identified. The maps should also include project driveways, local roads and intersections, parking, and transit facilities.
- 2. Project-related trip generation, distribution, and assignment. The assumptions and

methodologies used to develop this information should be detailed in the study, and should be supported with appropriate documentation.

- 3. Average Daily Traffic, AM and PM peak hour volumes and levels of service (LOS) on all roadways where potentially significant impacts may occur, including crossroads and controlled intersections for existing, existing plus project, cumulative and cumulative plus project scenarios. Calculation of cumulative traffic volumes should consider all traffic-generating developments, both existing and future, that would affect study area roadways and intersections. The analysis should clearly identify the project's contribution to area traffic and any degradation to existing and cumulative LOS. The Department's LOS threshold, which is the transition between LOS C and D, and is explained in detail in the *TIS Guide*, should be applied to all State facilities.
- 4. Schematic illustration of traffic conditions including the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, i.e., lane configurations, for the scenarios described above.
- 5. The project site building potential as identified in the General Plan. The project's consistency with both the Circulation Element of the General Plan and the Congestion Management Agency's Congestion Management Plan should be evaluated.
- 6. Identification of mitigation for any roadway mainline section or intersection with insufficient capacity to maintain an acceptable LOS with the addition of project-related and/or cumulative traffic. As noted above, the project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should also be fully discussed for all proposed mitigation measures.

Vehicle Trip Reduction

The Department encourages you to locate any needed housing, jobs and neighborhood services near major mass transit centers, with connecting streets configured to facilitate walking and biking, as a means of promoting mass transit use and reducing regional vehicle miles traveled and traffic impacts on the State highways.

We also encourage you to develop Travel Demand Management (TDM) policies to encourage usage of nearby public transit lines and reduce vehicle trips on the State Highway System. These policies could include lower parking ratios, car-sharing programs, bicycle parking and showers for employees, and providing transit passes to residents and employees, among others. For information about parking ratios, see the Metropolitan Transportation Commission (MTC) report *Reforming Parking Policies to Support Smart Growth* or visit the MTC parking webpage: http://www.mtc.ca.gov/planning/smart_growth/parking/

In addition, secondary impacts on pedestrians and bicyclists resulting from any traffic impact mitigation measures should be analyzed. The analysis should describe any pedestrian and bicycle mitigation measures and safety countermeasures that would in turn be needed as a means of maintaining and improving access to transit facilities and reducing vehicle trips and traffic impacts

Ms. Gerri Caruso/City of Sunnyvale April 2, 2012 Page 3

on State highways.

Encroachment Permit

Please be advised that any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by the Department. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW must be submitted to: Office of Permits, California Department of Transportation, District 4, P.O. Box 23660, Oakland, CA 94623-0660. Traffic-related mitigation measures should be incorporated into the construction plans during the encroachment permit process. See the following website for more information: <u>http://www.dot.ca.gov/hq/traffops/developserv/permits/</u>

Should you have any questions regarding this letter, please contact Keith Wayne of my staff by telephone at (510) 286-5737, or by email at <u>keith_wayne@dot.ca.gov</u>.

Sincerely,

GARX ARNOLD District Branch Chief Local Development – Intergovernmental Review

c: Scott Morgan, State Clearinghouse



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OFFICE OF COMMUNITY DEVELOPMENT

CITY HALL 10300 TORRE AVENUE • CUPERTINO, CA 95014-3255 (408) 777-3308 • FAX (408) 777-3333 • <u>planning@cupertino.org</u>

April 5, 2012

Ms. Gerri Caruso, Principal Planner City of Sunnyvale Community Development Department 456 West Olive Avenue P.O. Box 3707 Sunnyvale, CA 94088-3707

RE: Response to Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Sunnyvale Land Use and Transportation Element Update and Climate Action Plan

Dear Ms. Caruso:

Thank you for the opportunity to review and respond to your NOP for the above described project. We received the NOP on March 5, 2012.

Despite Sunnyvale's encouragement of alternative modes of transportation, continued growth in Sunnyvale and in surrounding communities will increase the amount of vehicular traffic experienced in Sunnyvale and surrounding communities. In consultation with the City's traffic engineer, we have observed that numerous commuters, exiting congested Highway 85 travel surface streets in Cupertino to reach Sunnyvale employment centers. I have attached a list of Cupertino signalized intersections that should be studied in your DEIR traffic analysis, along with Cupertino's approved and pending traffic trips inventory and trip distribution diagrams. Please note that Cupertino will not have the trip data for the proposed Apple Campus 2 project until the end of April 2012. Technical questions on traffic impacts should be directed to David Stillman of the Cupertino Public Works Department at 408-777-3249.

Planning forecast of your year 2035 buildout scenario indicate an increase in your jobs to housing units ratio from 1.41 to 1.83, which equates roughly to 30,307 additional workers without prospects for in-city housing opportunities. The proposed imbalance of jobs to housing will have a growth-inducing impact on the region which should be evaluated in the DEIR.

If you have any questions feel free to contact me at 408-777-3257 or colini@cupertino.org

Sincerely, (\cdot, \cdot) Colin Jung / Senior Planner

Attachments:

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A: Cupertino Signalized Intersections for DEIRB: Cupertino Approved and Pending TripsC: Trip Distribution Diagrams

	Cup	ertino Approved a	nd Pending Project]	rip Gene	ation				-				
				Wee	kday		A.M. Pec	ik Hour			P.M. Pe	ak Hour	
Development	Occupied	Land Use	Size	Rate	Trips	Rate	ľ	Out	Total	Rate	ľn	Out	Total
APPROVED													
1. Wolfe & Valico Prkwy (Valico Mali)		Condo	204 d.u.	'	•	ŗ	11	\$	65	,	55	27	82
Rose Bowl	No	Retail	60,000 s.f										
Occupancy of Vacant Space	Po N	Retail	200,000 s.f.										
Future Valleo Expansion (not approved)	No No	Retail	396,240 s.f.										
		Total Retail	589,000 s.f.				276	177	453		969	1049	2018
Azproval expired, new project anticipated but not approved		Restaurant	12,000 s.£				,	•			80	51	131
2. 10165 N. De Anza Blvd (Shashi Hotel)	No	Hotel	123 rooms										
3. 10212 N. De Anza Blvd (Leanning Game) (built)	No	Retal	2,007 s.f.										
		Retail	2,864 s.f.										
4. Valico Hotel	Ŵ	Hotel	200 rooms				65	46	111	_	53	55	108
5. Stevens Creek Blvd. & Stelling (Du Anza College Expansion)(2)		Jr. College	7,000 students	1.54	10,780	0.14	892	88	980	0.16	728	392	1,120
6, Main Street Cupertino (3)	No	Hotel	180 rooms										
	ž	Senior Housing	143										
	R	Retail	69,700 s.f						_				
	No	Office	292,000 s.f.										
	No	Athletic Club	60,000 s.f.						_				
		Total			10,345		524	166	690		427	569	1,086
7, 10100 N. Tantau Avenue	Ñ	Retzfil	10,582 s.f				35	38	73		30	23	53
8. Oaks Shopping Center (Stevens Creek/SR85) (4)	Ŷ	Hotel	122 rooms		126		32	23	55		29	30	59
		Retail	18,200 s.f.	. <u> </u>	1,785		26	17	5		78	85	163
		Office	18,300 s.f		361		42	6	48		17	82	66
		Meeting Rms	14,400 s.f.		428		19	13	32		17	17	34
		Total		,	3,545		119	59	178		141	214	355
 One Results Way (Bubb/McClellan, NW corner) 	No	Office	11,015 s.f.										
10. PW Market (De Anza/Homestead, SW corner)	No	Pharmacy	17,340 s.£										
		Shopping Cntr	138,424 s.f										
		Supermarket	48,024 s.f.										
		Total		,	2,484		37	26	63	,	130	131	261
11. Cupertino Village (Homestead/Wolfe, SW corner) (5)	No	Retail	24,455 s.f.		2,344		34	22	55		74	80	154
12. Crossroads	No	Shopping Cntr	87,110 s.f										
		High turnover	8,746 s,£					,					
		restaurant											
PENDING													
13. Biltmore Apts (6)	No	Mixed Use/Apt	93 units										
		Restaurant	7,000 s.É										
		Total			283		Ľ,	32	30		13	9	61

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14. Apple Campus 2 (7)

Notes:
Trip generation average rates from ITE's *Trip Generation*, 7th Edition.
(1) Peak hour trip generation provided by City of Cupertino.
(2) Trip generation from DKS, De Aurz College EIR (May 2002).
(3) Trip generation nates from Republic ITS.
(4) Trip generation nates from Republic ITS.







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FIGURE 7

PROJECT TRIP DISTRIBUTION AND

ASSIGNMENT TURNING MOVEMENT VOLUMES

FEHR & PEERS Occember 2009 SJ08-1111

PW MARKET



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A DESCRIPTION OF A

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Biltmore Apartments

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Cupertino Signalized Intersections for DEIR analysis Sunnyvale LUTE & CAP Project

North De Anza Boulevard @; Homestead Road, I-280 northbound ramp I-280 southbound ramp Stevens Creek Boulevard McClellan Road/Pacifica Avenue Bollinger Road SR-85 northbound ramp SR-85 southbound ramp

Wolfe Road @:

Homestead Road I-280 northbound ramp I-280 southbound ramp Stevens Creek Boulevard

Stelling @ Stevens Creek Boulevard Stelling @ Homestead Road



FEHR & PEERS

Traffic Count Locations



5750 ALMADEN EXPWY SAN JOSE, CA 95118-3614 TELEPHONE (408) 265-2600 FACSIMILE (408) 266-0271 www.volleywatet.org AN FOUAL CPROFEMENTY EMPLOYER

File: 32723 Various

April 10, 2012

Ms. Gerri Caruso Principal Planner City of Sunnyvale Post Office Box 3707 Sunnyvale, CA 94088

Subject: City of Sunnyvale Land Use and Transportation Element and Climate Action Plan EIR

Dear Ms. Caruso:

The Santa Clara Valley Water District is a special district with jurisdiction throughout Santa Clara County. The Water District acts as the county's groundwater management agency, principal water resources manager, flood protection agency and is the steward for its watersheds, streams and creeks, and underground aquifers.

We appreciate the opportunity to comment on the scope for the EIR for the City's Land Use and Transportation Element and Climate Action Plan. This letter transmits comments that focus on the areas of interest and expertise of the Water District. We would be happy to discuss any of these topics further or to help you locate information that would assist your continued development of the elements of your General Plan and EIR.

Flood Hazards

We would like to emphasize that State law now requires flood hazards to be addressed in your General Plan. AB 162 was passed into law in 2007 and certain requirements became effective on January 1, 2009. AB 162 requires cities to collaborate with local flood agencies to understand, plan for, and reduce flood risks, which includes identifing areas that are subject to flooding in the land use element.

Portions of Sunnyvale were historically subject to natural flooding from Stevens Creek and Calabazas Creek. Areas have been protected from flooding via flood protection projects (primarily levees, channel modifications, and culverts). Continued protection of developed areas in Sunnyvale is dependent on:

1. Ensuring that runoff from development or paving does not increase flood flows beyond the design carrying capacity of the creeks. This will be dependent on land use policies.

Ms. Gerri Caruso Page 2 April 10, 2012

2. Continued maintenance of existing projects. This will be dependent on continued funding and support of the activities of the Santa Clara Valley Water District.

Understanding the risks inherent to homes and businesses protected by levees and other flood protection projects are an important aspect to evaluating and managing the flood risk in your community. Land use, setbacks, building orientation and design should consider this potential to minimize potential damage. The EIR will need to address these potential flood impacts.

Your community can become a model community for flood-risk planning by proactively managing your FEMA-identified floodplains and non-regulated floodplains referred to above (areas protected from the 1% flood by levees) and implementing or increasing the City's rating in the CRS Program. Our staff would be happy to point you toward example plans, reports or other documents that could provide other example policies and language for your planning staff.

Climate Change and Sea-Level Rise

Sunnyvale includes areas that are subject to inundation under sea-level rise scenarios. The General Plan should reflect this information and the EIR must discuss the potential hazards from sea-level rise. For instance, development should be curtailed or at a minimum should be subject to strict guidelines in areas subject to sea-level rise or tidal inundation. This is a matter of public safety as well as economic protection. Critical facilities should be evaluated for their proximity to these – and all flood-prone – areas.

Water Supply

The Water District is dedicated to ensuring a reliable supply of healthy, clean drinking water now and in the future. To do this, the quality and quantity of existing water supply sources, including groundwater, must be sustained and protected. Additionally, water conservation and recycled water use are increasingly important components of the County's water supply portfolio. The EIR and water resources policies and programs in a General Plan should reflect the importance of these water supply and water quality issues. We suggest language that addresses the following topics:

- Locating and properly destroy abandoned wells and other conduits for contamination as a means of protecting groundwater quality;
- Avoiding groundwater quality degradation when implementing storm water management and flood protection actions associated with land development;
- Avoiding high-risk activities in vulnerable areas, such as near drinking water wells and waterways.

Stream Stewardship

The Water District works to protect our watersheds by promoting good ecosystem habitat, stream biology and water quality. Significant factors affecting watershed health include the extent of development within a riparian corridor and the extent pollutants, sediments, and trash that may enter a stream. The EIR needs to address the impact new development may have on Ms. Gerri Caruso Page 3 April 10, 2012

storm water in regard to the stability of the receiving creeks, the quality of the water, and downstream flood hazards.

Setbacks from riparian corridors are necessary to protect the sensitive ecology of riparian corridors, provide adequate space to maintain the creeks and levees, and if necessary, improve flood protection projects.

Connection to our rivers and creeks is an important element to the quality of life for county residents. The Water District supports creek-side trails where appropriate and protecting the open space that riparian corridors provide. As noted above, in many cases, open space adjacent to creeks can provide multiple beneficial uses such as recreation and flood protection.

The Water District is here to assist the City in ensuring that the community is protected from flood hazards and has a reliable and clean source of water. We welcome the opportunity to work with the City as you continue to develop the General Plan. If you have any questions or need further information, you can reach me at (408) 265-2607, extension 3095.

Sincerely,

Mad Martin

Michael Martin Environmental Planner Community Projects Review Unit

cc: S. Tippets, C. Elias, U. Chatwani, File

32723_54953mm04-10
APPENDIX B – AIR QUALITY DATA

Land Use and Transportation Element Santa Clara County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	4,166.67	1000sqft	95.65	4,166,667.00	0
Manufacturing	4,166.67	1000sqft	95.65	4,166,667.00	0
Condo/Townhouse	15,100.00	Dwelling Unit	943.75	15,100,000.00	27445
Strip Mall	4,166.67	1000sqft	95.65	4,166,667.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	5	8
Climate Zone	4			Operational Year	2	035
Utility Company	Pacific Gas & Electric Con	npany				
CO2 Intensity (Ib/MWhr)	445	CH4 Intensity (Ib/MWhr)	0.029	N2O Intensity (Ib/MWhr)	0.006	

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2012 CO2 Intensity Factor

Land Use - Estimated Likely Development

Construction Phase - No construction this model

Vehicle Trips - Trip generation and vehile miles traveled per traffic impact analysis

Woodstoves - Wood burning devices prohibited in Sunnyvale

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6,000.00	50.00
tblFireplaces	FireplaceWoodMass	92.40	0.00
tblFireplaces	NumberNoFireplace	4,681.00	6,795.00
tblFireplaces	NumberWood	2,114.00	0.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	Population	43,186.00	27,445.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	445
tblProjectCharacteristics	OperationalYear	2014	2035
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	HO_TL	5.40	5.80
tblVehicleTrips	HS_TL	4.30	5.81
tblVehicleTrips	HW_TL	12.40	5.79
tblVehicleTrips	ST_TR	7.16	6.59
tblVehicleTrips	ST_TR	1.49	3.82
tblVehicleTrips	ST_TR	1.64	3.45
tblVehicleTrips	ST_TR	42.04	13.77
tblVehicleTrips	SU_TR	6.07	6.59
tblVehicleTrips	SU_TR	0.62	3.82
tblVehicleTrips	SU_TR	0.76	3.45
tblVehicleTrips	SU_TR	20.43	13.77
tblVehicleTrips	WD_TR	11.42	3.45
tblVehicleTrips	WD_TR	44.32	13.77
tblWoodstoves	NumberCatalytic	75.50	0.00
tblWoodstoves	NumberNoncatalytic	75.50	0.00
tblWoodstoves	WoodstoveWoodMass	954.80	0.00

2.1 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/c	lay				lb/c	day					
Area	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						
Energy	15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						
Mobile	309.9960	465.0824	2,602.903 3	10.4931	724.7216	12.2119	736.9334	193.2514	11.2794	204.5307						
Total	1,065.7412	611.9951	3,927.181 2	11.3828	724.7216	42.5558	767.2774	193.2514	41.4865	234.7379						

3.0 Operational Detail - Mobile

3.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/c	lay				lb/d	day					
Mitigated	309.9960	465.0824	2,602.903 3	10.4931	724.7216	12.2119	736.9334	193.2514	11.2794	204.5307						
Unmitigated	309.9960	465.0824	2,602.903 3	10.4931	724.7216	12.2119	736.9334	193.2514	11.2794	204.5307						

3.2 Trip Summary Information

	Aver	age Daily Trip R	ate	Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	99,509.00	99,509.00	99509.00	186,567,326	186,567,326
Manufacturing	15,916.67	15,916.67	15916.67	39,456,322	39,456,322
Office Park	14,375.00	14,375.00	14375.00	32,769,842	32,769,842
Strip Mall	57,375.00	57,375.00	57375.00	84,164,542	84,164,542
Total	187,175.67	187,175.67	187,175.67	342,958,031	342,958,031

3.3 Trip Type Information

		Miles			Trip %			Trip Purpos	e %
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	5.79	5.81	5.80	26.10	29.10	44.80	86	11	3
Manufacturing	7.30	7.30	7.30	59.00	28.00	13.00	92	5	3
Office Park	7.30	7.30	7.30	33.00	48.00	19.00	82	15	3
Strip Mall	7.30	7.30	7.30	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.550618	0.058834	0.183192	0.119400	0.029455	0.004461	0.013811	0.028739	0.001904	0.001198	0.006279	0.000407	0.001702

4.0 Energy Detail

Historical Energy Use: N

4.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d			lb/d	day							
NaturalGas Mitigated	15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						
NaturalGas Unmitigated	15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						

4.2 Energy by Land Use - NaturalGas

	NaturalGa s Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr					lb/	day							lb/d	day		
Manufacturing	312900	3.3744	30.6764	25.7682	0.1841		2.3314	2.3314		2.3314	2.3314						
Office Park	253653	2.7355	24.8679	20.8891	0.1492		1.8900	1.8900		1.8900	1.8900						
Strip Mall	28424.7	0.3065	2.7867	2.3409	0.0167		0.2118	0.2118		0.2118	0.2118						
Condo/Townhouse	805662	8.6885	74.2473	31.5946	0.4739		6.0030	6.0030		6.0030	6.0030						
Total		15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						

5.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/c				lb/c	day						
Mitigated	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						
Unmitigated	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						

5.2 Area by SubCategory

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory					lb/c	lay				lb/c	day					
Architectural Coating	93.9588					0.0000	0.0000		0.0000	0.0000						
Consumer Products	590.6400					0.0000	0.0000		0.0000	0.0000						
Hearth	18.8084	8.5000e- 004	1.0259	0.0000		12.9949	12.9949		12.8581	12.8581						
Landscaping	37.2332	14.3335	1,242.659 3	0.0659		6.9130	6.9130		6.9130	6.9130						
Total	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						

Land Use and Transportation Element Santa Clara County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	4,166.67	1000sqft	95.65	4,166,667.00	0
Manufacturing	4,166.67	1000sqft	95.65	4,166,667.00	0
Condo/Townhouse	15,100.00	Dwelling Unit	943.75	15,100,000.00	27445
Strip Mall	4,166.67	1000sqft	95.65	4,166,667.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58	;
Climate Zone	4			Operational Year	20	35
Utility Company	Pacific Gas & Electric Con	npany				
CO2 Intensity (Ib/MWhr)	445	CH4 Intensity (Ib/MWhr)	0.029	N2O Intensity (Ib/MWhr)	0.006	

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2012 CO2 Intensity Factor

Land Use - Estimated Likely Development

Construction Phase - No construction this model

Vehicle Trips - Trip generation and vehile miles traveled per traffic impact analysis

Woodstoves - Wood burning devices prohibited in Sunnyvale

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6,000.00	50.00
tblFireplaces	FireplaceWoodMass	92.40	0.00
tblFireplaces	NumberNoFireplace	4,681.00	6,795.00
tblFireplaces	NumberWood	2,114.00	0.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	Population	43,186.00	27,445.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	445
tblProjectCharacteristics	OperationalYear	2014	2035
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	HO_TL	5.40	5.80
tblVehicleTrips	HS_TL	4.30	5.81
tblVehicleTrips	HW_TL	12.40	5.79
tblVehicleTrips	ST_TR	7.16	6.59
tblVehicleTrips	ST_TR	1.49	3.82
tblVehicleTrips	ST_TR	1.64	3.45
tblVehicleTrips	ST_TR	42.04	13.77
tblVehicleTrips	SU_TR	6.07	6.59
tblVehicleTrips	SU_TR	0.62	3.82
tblVehicleTrips	SU_TR	0.76	3.45
tblVehicleTrips	SU_TR	20.43	13.77
tblVehicleTrips	WD_TR	11.42	3.45
tblVehicleTrips	WD_TR	44.32	13.77
tblWoodstoves	NumberCatalytic	75.50	0.00
tblWoodstoves	NumberNoncatalytic	75.50	0.00
tblWoodstoves	WoodstoveWoodMass	954.80	0.00

2.1 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/c	lay							lb/c	day		
Area	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						
Energy	15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						
Mobile	321.6706	510.3578	3,094.699 4	9.8188	724.7216	12.2709	736.9924	193.2514	11.3336	204.5850						
Total	1,077.4158	657.2705	4,418.977 3	10.7086	724.7216	42.6148	767.3364	193.2514	41.5408	234.7922						

3.0 Operational Detail - Mobile

3.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/c			lb/d	lay							
Mitigated	321.6706	510.3578	3,094.699 4	9.8188	724.7216	12.2709	736.9924	193.2514	11.3336	204.5850						
Unmitigated	321.6706	510.3578	3,094.699 4	9.8188	724.7216	12.2709	736.9924	193.2514	11.3336	204.5850						

3.2 Trip Summary Information

	Aver	age Daily Trip R	ate	Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	99,509.00	99,509.00	99509.00	186,567,326	186,567,326
Manufacturing	15,916.67	15,916.67	15916.67	39,456,322	39,456,322
Office Park	14,375.00	14,375.00	14375.00	32,769,842	32,769,842
Strip Mall	57,375.00	57,375.00	57375.00	84,164,542	84,164,542
Total	187,175.67	187,175.67	187,175.67	342,958,031	342,958,031

3.3 Trip Type Information

		Miles			Trip %			Trip Purpos	e %
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	5.79	5.81	5.80	26.10	29.10	44.80	86	11	3
Manufacturing	7.30	7.30	7.30	59.00	28.00	13.00	92	5	3
Office Park	7.30	7.30	7.30	33.00	48.00	19.00	82	15	3
Strip Mall	7.30	7.30	7.30	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.550618	0.058834	0.183192	0.119400	0.029455	0.004461	0.013811	0.028739	0.001904	0.001198	0.006279	0.000407	0.001702

4.0 Energy Detail

Historical Energy Use: N

4.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/d			lb/d	day							
NaturalGas Mitigated	15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						
NaturalGas Unmitigated	15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						

4.2 Energy by Land Use - NaturalGas

	NaturalGa s Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr					lb/	day							lb/d	day		
Manufacturing	312900	3.3744	30.6764	25.7682	0.1841		2.3314	2.3314		2.3314	2.3314						
Office Park	253653	2.7355	24.8679	20.8891	0.1492		1.8900	1.8900		1.8900	1.8900						
Strip Mall	28424.7	0.3065	2.7867	2.3409	0.0167		0.2118	0.2118		0.2118	0.2118						
Condo/Townhouse	805662	8.6885	74.2473	31.5946	0.4739		6.0030	6.0030		6.0030	6.0030						
Total		15.1049	132.5784	80.5927	0.8239		10.4361	10.4361		10.4361	10.4361						

5.0 Area Detail

5.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					lb/c			lb/c	lay							
Mitigated	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						
Unmitigated	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						

5.2 Area by SubCategory

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory					lb/d	lay							lb/c	day		
Architectural Coating	93.9588					0.0000	0.0000		0.0000	0.0000						
Consumer Products	590.6400					0.0000	0.0000		0.0000	0.0000						
Hearth	18.8084	8.5000e- 004	1.0259	0.0000		12.9949	12.9949		12.8581	12.8581						
Landscaping	37.2332	14.3335	1,242.659 3	0.0659		6.9130	6.9130		6.9130	6.9130						
Total	740.6403	14.3343	1,243.685 2	0.0659		19.9078	19.9078		19.7710	19.7710						

Land Use and Transportation Element Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	4,166.67	1000sqft	95.65	4,166,667.00	0
Manufacturing	4,166.67	1000sqft	95.65	4,166,667.00	0
Condo/Townhouse	15,100.00	Dwelling Unit	943.75	15,100,000.00	27445
Strip Mall	4,166.67	1000sqft	95.65	4,166,667.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Cor	npany			
CO2 Intensity (Ib/MWhr)	445	CH4 Intensity (Ib/MWhr)	0.029	N2O Intensity (Ib/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - PG&E 2012 CO2 Intensity Factor

Land Use - Estimated Likely Development

Construction Phase - No construction this model

Vehicle Trips - Trip generation and vehile miles traveled per traffic impact analysis

Woodstoves - Wood burning devices prohibited in Sunnyvale

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6,000.00	50.00
tblFireplaces	FireplaceWoodMass	92.40	0.00
tblFireplaces	NumberNoFireplace	4,681.00	6,795.00
tblFireplaces	NumberWood	2,114.00	0.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	Population	43,186.00	27,445.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	445
tblProjectCharacteristics	OperationalYear	2014	2035
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	HO_TL	5.40	5.80
tblVehicleTrips	HS_TL	4.30	5.81
tblVehicleTrips	HW_TL	12.40	5.79
tblVehicleTrips	ST_TR	7.16	6.59
tblVehicleTrips	ST_TR	1.49	3.82
tblVehicleTrips	ST_TR	1.64	3.45
tblVehicleTrips	ST_TR	42.04	13.77
tblVehicleTrips	SU_TR	6.07	6.59
tblVehicleTrips	SU_TR	0.62	3.82
tblVehicleTrips	SU_TR	0.76	3.45
tblVehicleTrips	SU_TR	20.43	13.77
tblVehicleTrips	WD_TR	11.42	3.45
tblVehicleTrips	WD_TR	44.32	13.77
tblWoodstoves	NumberCatalytic	75.50	0.00
tblWoodstoves	NumberNoncatalytic	75.50	0.00
tblWoodstoves	WoodstoveWoodMass	954.80	0.00

2.0 Emissions Summary

2.1 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Area	128.3306	1.2900	111.8415	5.9300e- 003		0.6500	0.6500		0.6498	0.6498						
Energy	2.7567	24.1956	14.7082	0.1504		1.9046	1.9046		1.9046	1.9046						
Mobile	54.5262	89.4559	504.5560	1.8027	127.3961	2.2244	129.6205	34.0664	2.0545	36.1210						
Waste						0.0000	0.0000		0.0000	0.0000						
Water						0.0000	0.0000		0.0000	0.0000						
Total	185.6134	114.9415	631.1057	1.9590	127.3961	4.7791	132.1751	34.0664	4.6089	38.6753						

3.0 Operational Detail - Mobile

3.1 Mitigation Measures Mobile

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Mitigated	54.5262	89.4559	504.5560	1.8027	127.3961	2.2244	129.6205	34.0664	2.0545	36.1210						
Unmitigated	54.5262	89.4559	504.5560	1.8027	127.3961	2.2244	129.6205	34.0664	2.0545	36.1210						

3.2 Trip Summary Information

	Aver	age Daily Trip Ra	ate	Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	99,509.00	99,509.00	99509.00	186,567,326	186,567,326
Manufacturing	15,916.67	15,916.67	15916.67	39,456,322	39,456,322
Office Park	14,375.00	14,375.00	14375.00	32,769,842	32,769,842
Strip Mall	57,375.00	57,375.00	57375.00	84,164,542	84,164,542
Total	187,175.67	187,175.67	187,175.67	342,958,031	342,958,031

3.3 Trip Type Information

		Miles			Trip %			Trip Purpos	ie %
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	5.79	5.81	5.80	26.10	29.10	44.80	86	11	3
Manufacturing	7.30	7.30	7.30	59.00	28.00	13.00	92	5	3
Office Park	7.30	7.30	7.30	33.00	48.00	19.00	82	15	3
Strip Mall	7.30	7.30	7.30	16.60	64.40	19.00	45	40	15

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.550618	0.058834	0.183192	0.119400	0.029455	0.004461	0.013811	0.028739	0.001904	0.001198	0.006279	0.000407	0.001702

4.0 Energy Detail

Historical Energy Use: N

4.1 Mitigation Measures Energy

	ROG	NOx	со	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						
NaturalGas Mitigated	2.7567	24.1956	14.7082	0.1504		1.9046	1.9046		1.9046	1.9046						
NaturalGas Unmitigated	2.7567	24.1956	14.7082	0.1504		1.9046	1.9046		1.9046	1.9046						

4.2 Energy by Land Use - NaturalGas

	NaturalGa s Use	ROG	NOx	со	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr					tor	is/yr							MT	/yr		
Manufacturing	1.14208e+ 008	0.6158	5.5985	4.7027	0.0336		0.4255	0.4255		0.4255	0.4255						
Office Park	9.25833e+ 007	0.4992	4.5384	3.8123	0.0272		0.3449	0.3449		0.3449	0.3449						
Strip Mall	1.0375e+0 07	0.0559	0.5086	0.4272	3.0500e- 003		0.0387	0.0387		0.0387	0.0387						
Condo/Townhouse	2.94067e+ 008	1.5857	13.5501	5.7660	0.0865		1.0955	1.0955		1.0955	1.0955						
Total		2.7566	24.1956	14.7082	0.1504		1.9046	1.9046		1.9046	1.9046						

4.3 Energy by Land Use - Electricity <u>Unmitigated</u>

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr		MT	ſ/yr	
Condo/Townhouse	6.50991e+ 007				
Manufacturing	3.7625e+0 07				
Office Park	9.04167e+ 007				
Strip Mall	4.87083e+ 007				
Total					

5.0 Area Detail

5.1 Mitigation Measures Area

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Mitigated	128.3306	1.2900	111.8415	5.9300e- 003		0.6500	0.6500		0.6498	0.6498						
Unmitigated	128.3306	1.2900	111.8415	5.9300e- 003		0.6500	0.6500		0.6498	0.6498						

5.2 Area by SubCategory

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr						MT/yr									
Architectural Coating	17.1475					0.0000	0.0000		0.0000	0.0000						
Consumer Products	107.7918					0.0000	0.0000		0.0000	0.0000						
Hearth	0.0403	0.0000	2.2000e- 003	0.0000		0.0279	0.0279		0.0276	0.0276						
Landscaping	3.3510	1.2900	111.8393	5.9300e- 003		0.6222	0.6222		0.6222	0.6222						
Total	128.3306	1.2900	111.8415	5.9300e- 003		0.6500	0.6500		0.6498	0.6498						

APPENDIX C - TRAFFIC DATA AND ANALYSES









Land Use and Transportation Element

Draft Traffic Impact Analysis



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Prepared for:

City of Sunnyvale

March 23, 2016



Hexagon Office: 4 North Second Street, Suite 400 San Jose, CA 95113 Hexagon Job Number: 15GB40 Phone: 408.971.6100 Document Name: LUTE TIA 2016-03-22.pdf

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Executive Summary

This report presents the results of the traffic analysis for the proposed City of Sunnyvale Land Use and Transportation Element (LUTE).

As a major component of the proposed Sunnyvale General Plan (GP), the Land Use and Transportation Element (LUTE) establishes the fundamental framework of how the City will be laid out, and how various land uses, development and transportation facilities will function together. The LUTE consists of an aggregated set of goals and policies with the overall purpose of moving Sunnyvale towards a complete community that relies less on automobiles and more on alternative modes of transportation. The LUTE is developed to help guide the City's land use and transportation decisions to the horizon year of 2035.

This study was conducted for the purpose of identifying the potential long-term traffic impacts of the proposed LUTE. The potential impacts of the LUTE were evaluated in accordance with the standards set forth by the City of Sunnyvale and the Santa Clara County Valley Transportation Authority (VTA) Congestion Management Program (CMP). The LUTE is estimated to generate more than 100 peak hour trips. The traffic analysis is based on the AM and PM peak hour levels of service for 98 signalized intersections. Eight of the study intersections are within the City of Mountain View, four are within the City of Cupertino, 15 are within the City of Santa Clara, and one is within the City of San Jose. 27 of the study intersections are CMP intersections. The study intersections are selected to include locations where the proposed LUTE is expected to generate 10 or more peak-hour trips per lane.

The Santa Clara County VTA CMP guidelines require that the CMP freeway segments be evaluated to determine the impact of added traffic for projects that generate trips equal to or greater than one percent of the freeway segment's capacity. The proposed LUTE is expected to generate added traffic volume on 94 freeway segments (29 on US 101, 18 on I-280, 11 on SR 237, 12 on I-880, 19 on SR 85, and 5 on SR 87) within Santa Clara County, on 4 freeway segments (2 on US 101, and 2 on I-280) within San Mateo County, and on 8 segments on I-880 within Alameda County. Therefore, a freeway analysis is conducted on these freeway segments in accordance with the respective congestion management agency guidelines. The traffic analysis also includes a capacity analysis for 32 freeway ramps.

SB 743

To further the state's commitment to the goals of SB 375, AB 32, and AB 1358, Governor Brown signed SB 743 on September 27, 2013. SB 743 requires the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines (Title 14 of the California Code of Regulations sections and following) to provide an alternative to LOS for evaluating transportation impacts. Once the CEQA Guidelines are amended to include those alternative criteria, auto delay will no longer be considered a significant impact under CEQA. Measurements of transportation impacts may include "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated."

Pursuant to SB 743, OPR released a *Draft of Updates to the CEQA Guidelines* in August 2014. OPR's *Draft of Updates* proposes VMT as the replacement metric for LOS in the context of CEQA. While OPR emphasizes that a lead agency has the discretionary authority to establish thresholds of significance, the *Draft of Updates* suggest criteria that indicate when a project may have a significant, or less than significant, transportation impact on the environment. For instance, a project that results in VMTs greater than the regional average for the land use type (e.g. residential, employment, commercial) may indicate a significant impact. Alternatively, a project may have a less than significant impact if it is located within 0.5 mile of an existing major transit stop, or results in a net decrease in VMTs compared to existing conditions.

The public comment period on OPR's *Draft of Updates* ended in November 2014, and on May 1, 2015 OPR released the *Summary of Feedback*. It is anticipated that further revisions to the *Draft of Updates* will be forthcoming prior to adoption of amendments to the CEQA Guidelines. The revised CEQA guidelines are still in draft form and it is anticipated that they will undergo further changes as a result of significant public input. Since OPR has not yet adopted new CEQA Guidelines for the alternative criteria to LOS, the adopted significance criteria for the City of Sunnyvale, City of Mountain View, City of Santa Clara, City of Cupertino, City of San Jose, and VTA's CMP still remain applicable to the proposed project. It is anticipated that the agencies will revisit the adopted significance criteria once new CEQA guidelines are adopted by the State.

LUTE Analysis - Year 2035 Travel Demand Model Forecasts

The 2035 forecasts of intersection turning movements, freeway traffic, ramp volumes, and vehicle miles traveled were completed using the Sunnyvale Travel Demand Forecasting Model (STFM). The STFM is a mathematical representation of travel within the nine counties in the San Francisco Bay Area, and is calibrated to represent travel within the City of Sunnyvale. The model uses socioeconomic data, such as number of jobs and households, for different geographic areas (transportation analysis zones) to predict the travel from place to place in the future. The model is adjusted (validated) using current socioeconomic data to predict current traffic volume. Model forecasts are compared to actual counts in order to make the adjustments. There are 172 transportation analysis zones within the model to represent the City of Sunnyvale. The 2035 socioeconomic data are generated by the Association of Bay Area Governments and refined by VTA. For the Current General Plan and 2035 Proposed General Plan model forecasts, socioeconomic data were supplied by the Sunnyvale Planning Department.

The STFM includes improvements to the roadway network as part of the Valley Transportation Plan (VTP) and the Sunnyvale Transportation Impact Fee (TIF). Significant roadway improvements that are funded or planned to be funded within or near Sunnyvale are listed below:

- Construct auxiliary lanes on eastbound SR 237 between Mathilda Avenue and Fair Oaks Avenue.
- Extend express lanes on SR 237 to SR 85.
- Construct auxiliary lanes on southbound US 101 between Lawrence Expressway and Great America Parkway, and between Ellis Street and SR 237.
- Construct auxiliary lanes on southbound SR 85 between SR 237 and El Camino Real.
- Reconstruct the US 101/Mathilda and SR 237/Mathilda interchanges.
- Widen the ramp from northbound SR 85 to eastbound SR 237 to two lanes. Construct an auxiliary lane on eastbound SR 237 from SR 85 to Middlefield Road.
- Construct a loop on-ramp from westbound Middlefield Road to westbound SR 237. Eliminate the intersection at Middlefield Road and westbound SR 237 off-ramp, and re-align the off-ramp to the intersection on Middlefield Road at Ferguson Drive.
- Extend Mary Avenue north over the SR 237/US 101 interchange via a flyover and connect with Enterprise Way.
- Construct grade separations on Lawrence Expressway at the intersections with Reed Avenue/Monroe Street, Kifer Road, and Arques Avenue.
- Construct auxiliary lane on southbound Lawrence Expressway between the SR 237 loop ramps.
- Construct auxiliary lanes on Central Expressway between Mary Avenue and Lawrence Expressway.
- Widen Central Expressway between Lawrence Expressway and San Tomas Expressway to six lanes.

Under the 2035 proposed GP conditions, the Lawrence Station Area Plan (LSAP) proposes a road diet on Kifer Road within the study area. Kifer Road within the LSAP plan area would be narrowed from the existing 5-lanes to 3-lanes (one lane in each direction and a two-way center left-turn lane). As part of the road diet, Kifer Road would receive enhanced bicycle and pedestrian facilities.



Intersection Levels of Service under 2035 Proposed GP Conditions

The results show that several of the signalized intersections would operate at unacceptable levels of service under the 2035 proposed GP conditions:

- Lawrence Expressway & Tasman Drive (#11) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Lakehaven Drive (#12) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Oakmead Parkway (#15) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Arques Avenue (#16) PM Peak Hour (LOS F)
- Duane/Stewart & Duane Avenue (#19) AM Peak Hour (LOS F)
- Wolfe Road & Arques Avenue (#23) AM Peak Hour (LOS E)
- Wolfe Road & Kifer Road (#24) AM & PM Peak Hours (LOS F)
- Wolfe Road & Reed Avenue (#26) AM Peak Hour (LOS E+)
- Wolfe Road & Fremont Avenue (#29) AM & PM Peak Hours (LOS E & LOS F, respectively)
- Fair Oaks Avenue & Arques Avenue (#31) AM & PM Peak Hours (LOS F)
- Fair Oaks Avenue & El Camino Real (#34) PM Peak Hour (LOS F)
- Sunnyvale-Saratoga Road & Remington Drive (#40) PM Peak Hour (LOS F)
- Mathilda Avenue & El Camino Real (#48) PM Peak Hour (LOS F)
- Hollenbeck Avenue & El Camino Real (#49) PM Peak Hour (LOS F)
- Mary Avenue & Maude Avenue (#51) PM Peak Hour (LOS E-)
- Mary Avenue & Central Expressway (#52) AM & PM Peak Hours (LOS F)
- Mary Avenue & El Camino Real (#54) PM Peak Hour (LOS F)
- Mary Avenue & Fremont Avenue (#55) AM & PM Peak Hours (LOS F)
- SR 85 Northbound Ramp & Fremont Avenue (#59) AM Peak Hour (LOS E)
- SR 85 Southbound Ramp & Fremont Avenue (#60) AM & PM Peak Hours (LOS F)
- Ellis Street & Middlefield Road (#63) AM Peak Hour (LOS E+)
- Lawrence Expressway & Cabrillo Avenue (#82) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Benton Street (#84) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Homestead Road (#85) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Pruneridge Avenue (#86) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & I-280 Southbound Ramp (#90) AM & PM Peak Hours (LOS F and LOS E+, respectively)
- Bowers Avenue & Central Expressway (#95) AM & PM Peak Hours (LOS F)
- Bowers Avenue & Kifer Road (#96) PM Peak Hour (LOS E)
- Bowers Avenue & Monroe Street (#98) PM Peak Hour (LOS F)

Of the 29 intersections projected to operate at unacceptable levels of service under the 2035 proposed GP conditions, four of the intersections are already operating at unacceptable levels of service under existing conditions during at least one peak hour. Twenty of the intersections would be operating at unacceptable levels of service under current GP conditions during at least one peak hour. The remaining five intersections would be operating at acceptable levels of service under current GP conditions during at least one peak hour. The remaining five intersections would be operating at acceptable levels of service under both existing and current GP conditions.

The intersections on Mathilda Avenue at the SR 237 ramps are proposed to be reconstructed under the current GP and the 2035 proposed GP conditions. At the time of this report, the proposed intersection configurations have not been finalized. Therefore, this report assumes that the intersections at the Mathilda Avenue/SR 237 interchange will operate at an acceptable LOS D under the 2035 proposed GP conditions.

Intersection levels of service results for the existing, current GP, and 2035 proposed GP scenarios are presented on Table ES-1.

Methodology for Determining LUTE and Cumulative Intersection Impacts

Intersection levels of service under the 2035 proposed GP conditions are evaluated relative to existing conditions to determine the potential significant impacts of the proposed GP. This set of impacts is denoted as the cumulative impacts, and is determined based on the intersection impact criteria discussed in Chapter 1.

The Sunnyvale Travel Demand Forecasting Model (STFM) was used to forecast the 2035 proposed traffic volumes. The STFM included three proposed land use changes within the City of Sunnyvale, the Lawrence Station Area Plan (LSAP), Peery Park Specific Plan (PPSP), and Land Use and Transportation Element (LUTE). In addition to growth within Sunnyvale, the STFM includes regional growth for cities within nine Counties. This regional growth is consistent with approved General Plans and regional transportation models.

Since other land uses besides the LUTE are included in the model, the 2035 traffic analysis included traffic volumes not only from the LUTE, but also from the PPSP, LSAP, and other cities. These are referred to as cumulative traffic volumes or results. If an intersection was identified to have a cumulative impact by all these land use changes, a separate analysis had to be completed to determine if the LUTE had a significant impact on its own. To accomplish this, LUTE traffic was segregated from all other traffic. Once the LUTE traffic was segregated, each cumulatively impacted intersection was analyzed to determine whether the LUTE traffic would cause an impact on its own by calculating the level of LUTE traffic volumes and the level of traffic volumes required to cause an impact.

This process was completed through a full technical analysis. The volumes attributable to each land use were estimated using the select zone analysis within the STFM. Regional traffic was defined as trips that have neither a trip origin nor destination within the City of Sunnyvale. The threshold for a significant contribution at each impacted intersection was calculated by determining the critical amount of traffic growth between the 2035 proposed GP and existing conditions that would generate a significant intersection impact. The LUTE caused a significant intersection impact if the Project-related traffic alone exceeded the threshold for a significant contribution, compared with existing conditions.

CEQA Analysis – LUTE Intersection Impacts

For CEQA purposes, the 2035 proposed GP conditions are compared against existing conditions to determine LUTE impacts. The methodology for determining LUTE intersection impacts and cumulative intersection impacts for CEQA purposes are discussed at the beginning of this chapter.

LUTE Intersection Impacts

Based on the methodology for determining LUTE intersection impacts, the LUTE would generate a significant intersection impact at the following study intersections:

- Lawrence Expressway & Tasman Drive (#11) PM Peak Hour
- Lawrence Expressway & Lakehaven Drive (#12) PM Peak Hour
- Lawrence Expressway & Oakmead Parkway (#15) AM & PM Peak Hours
- Duane Avenue/Stewart Drive & Duane Avenue (#19) AM Peak Hour
- Wolfe Road & Fremont Avenue (#29) AM & PM Peak Hours
- Fair Oaks Avenue & Argues Avenue (#31) AM & PM Peak Hours
- Fair Oaks Avenue & El Camino Real (#34) PM Peak Hour
- Sunnyvale-Saratoga Road & Remington Drive (#40) PM Peak Hour
- Mathilda Avenue & El Camino Real (#48) PM Peak Hour
- Mary Avenue & Central Expressway (#52) PM Peak Hour
- Mary Avenue & Fremont Avenue (#55) AM & PM Peak Hours
- SR 85 Southbound & Fremont Avenue (#60) AM & PM Peak Hours
- Lawrence Expressway & Cabrillo Avenue (#82) AM & PM Peak Hours
- Lawrence Expressway & Benton Street (#84) AM & PM Peak Hours
- Lawrence Expressway & Homestead Road (#85) AM & PM Peak Hours
- Lawrence Expressway & Pruneridge Avenue (#86) AM Peak Hour
- Bowers Avenue & Central Expressway (#95) PM Peak Hour

Potential mitigation strategies are discussed below.



CEQA Analysis - Potential Mitigation Strategies for LUTE Impacts

Lawrence Expressway & Tasman Drive (#11) [CMP]

Potential At-Grade Mitigation: At this intersection, the August 2015 update of the *County of Santa Clara Expressway Plan 2040* has identified depressing the light rail tracks under the intersection as a Tier 3 project. At the time of this report, there exist no finalized intersection reconfiguration plans. It is assumed that the finalized reconfiguration plans would restore intersection operations to an acceptable LOS E. There exist no other feasible at-grade mitigations.

However, since the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure implementation of any mitigation measure. The timing of implementation as well as availability of funding for the identified mitigation measure are also uncertain. Therefore, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Lakehaven Drive (#12)

Potential At-Grade Mitigation: At-grade mitigation would require widening the northbound leg to include a total of two left-turn lanes, four through lanes, and one right-turn lane. The southbound leg would need to be widened to two left-turn lanes, five through lanes, and one right-turn lane. The eastbound leg would need to be widened to two left-turn lanes, one shared through-right lane, and one right-turn lane. The westbound leg would require a third left-turn lane. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection because 1) the intersection is not within the City's jurisdiction and the County has no plans for at-grade improvements, 2) the required mitigation would displace homes and businesses, and 3) the required mitigation would lead to secondary pedestrian and bicycle impacts.

Potential Grade-Separation Mitigation: An interchange would eliminate the LUTE impact at this intersection. However, this intersection is within the County of Santa Clara jurisdiction, and the County currently has no plans to construct an interchange at this intersection. Therefore, the LUTE intersection impact at this intersection would be *significant and unavoidable*.

Lawrence Expressway & Oakmead Parkway (#15)

Proposed At-Grade Mitigation: At this intersection, the August 2015 update of the *County of Santa Clara Expressway Plan 2040* has identified a Tier 1 interim project of converting the southbound HOV lane to a mixed-flow lane. This interim project would only partially mitigate the intersection impact. The intersection impact could be further reduced (but not fully mitigated) by restriping the eastbound lane to include three left-turn lanes, one through lane, and one right-turn lane. There exists no feasible at-grade improvement that would fully mitigate the intersection impact.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. Therefore, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.



Duane Ave/Stewart Dr & Duane Avenue (#19)

Proposed At-Grade Mitigation: Mitigation would require restriping the westbound leg to one leftturn lane, one shared through-right lane, and one right-turn lane. There would be street widening or modifications to signal phasing. Secondary impacts to pedestrian and bicyclists would also be minimal.

An alternative mitigation measure is to convert the intersection to a 2-lane roundabout. Right-of-way acquisition would be required mostly on the northeast, northwest, and southwest corners. Pedestrian crosswalks would be provided 20-40 feet back from the roundabout. However, there would be no protected pedestrian walk phases.

With implementation of either proposed mitigation measure, the intersection would operate at an acceptable LOS C (LOS A with roundabout) during the AM peak hour. With implementation of the proposed mitigation measure, the LUTE intersection impact at this intersection would be *less than significant*.

Wolfe Road & Fremont Avenue (#29)

Potential Mitigation: Mitigation would require construction of an exclusive southbound right-turn lane for the length of the segment. The northbound leg would also require a second left-turn lane. The eastbound inner left-turn lane would require restricting the U-turn movement to allow for a southbound overlap right-turn phase. Depending on the extent of the median on the north leg that could be removed, the north leg would be widened between 3 to 11 feet. The north leg would be realigned to accommodate the southbound right-turn. There is existing right-of-way on the northeast quadrant of the intersection. The second northbound left-turn lane would need to be the same length as the existing left-turn lane. Right-of-way acquisition would be required from the southwest quadrant. The south leg would need to be realigned. The south leg would be widened by 10 feet.

With the proposed mitigation, the intersection would operate at an acceptable LOS D during both the AM and PM peak hours. Secondary impacts associated with this mitigation on the pedestrian and bicycle facilities would not be significant. The increased exposure time ranges from approximately 1 to 3 seconds for pedestrians and 1 to 2 seconds for bicyclists. This increased exposure time is minimal. The required right-of-way acquisition would not displace businesses. Therefore, with the proposed mitigation measure, the LUTE intersection impact would be *less than significant*.

Fair Oaks Avenue & Arques Avenue (#31)

Potential Mitigation: Mitigation would require construction of dedicated right-turn pockets on the southbound, eastbound, and westbound legs. The southbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket would require additional right-of-way acquisition and displacement of business parking. The southbound right-turn pocket would also widen the north crosswalk by approximately 12 feet. The eastbound right-turn pocket would need to be approximately 150 feet long. The existing median on the eastbound leg could be shifted north to accommodate the right-turn pocket within the existing right-of-way. The westbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket could be accommodated through removing the inner east receiving lane for approximately 150 to 200 feet in length. The westbound lanes would all be shifted south by one lane to accommodate the right-turn pocket. Removing the inner eastbound receiving lane would not cause secondary impacts because the other three legs each have only one lane feeding into the eastbound receiving lanes. The eastbound through lane would require re-aligning. Since the westbound right-turn pocket can be accommodated within the existing right-of-way, there would be minimal secondary impacts to pedestrian and bicyclists.

With the proposed mitigation, the intersection would operate at LOS D during both the AM and PM peak hours. The eastbound and westbound right-turn pockets could be accommodated within the existing right-of-way, and would not cause secondary impacts to pedestrians and bicyclists. The southbound right-turn pocket would displace approximately half of the parking spaces for the business at the northwest corner of the intersection. There would also be secondary impacts associated with this right-turn pocket such as increased pedestrian and bicyclist exposure to traffic when crossing the intersection. The increased exposure time ranges from approximately 3 seconds for pedestrians and 2 seconds for bicyclists. This increased exposure time is minimal. It is uncertain whether the City of Sunnyvale would be able to acquire the required right-of-way for the southbound right-turn pocket. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Fair Oaks Avenue & El Camino Real (#34) [CMP]

Potential Mitigation: Mitigation would require construction of a dedicated southbound right-turn pocket, a second eastbound left-turn lane, and a second westbound left-turn lane. The southbound right-turn pocket would need to be approximately 150 feet, ending at the southern end of the bike lane. The bike lane would need to be extended south to the stop-bar. The weaving section for bikes and right-turn vehicles should be maintained at 50 feet. The outer southbound through lane would require widening by approximately 12 feet to accommodate the right-turn pocket. The north crosswalk would not be widened. The second eastbound left-turn lane would need to be approximately 200 feet long. The second westbound left-turn lane would need to be the same length as the existing left-turn lane. Right-of-way acquisition would be required for the second eastbound and westbound left-turn lanes. Depending on the extent of the median that could be removed, the east and west legs would both need to be widened between 4 to 11 feet. The east-west through lanes would also require re-alignment. Additional right-of-way acquisition would be required.

With the proposed mitigation, the intersection would operate at an acceptable LOS E during the PM peak hour. The required right-of-way acquisition to accommodate the second eastbound and westbound left-turn lanes would displace business parking and remove trees. It is uncertain whether the required right-of-way can be acquired. The intersection is also controlled by Caltrans, so the City cannot ensure the implementation of the mitigation measure. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Sunnyvale-Saratoga Road & Remington Drive (#40) [CMP]

Potential Mitigation: Mitigation would require a dedicated right turn lane on the southbound leg. The westbound leg would require widening to include a second through lane. The southbound right-turn lane would need to be 200 feet in length, extending north to the beginning of the bike weaving area. The existing bike lane would be striped on the inner side of the right-turn lane. The north crosswalk would require lengthening by 12 feet. Additional right-of-way acquisition would be required. The second westbound through lane would need to be extended to Azure Street so the inner westbound through lane east of Azure Street would feed into both the left-turn lanes and the inner through lane. Remington Drive would require realignment to accommodate the second westbound through lane. The east crosswalk would require lengthening by 12 feet. Additional right-of-way acquisition would be required.

With the proposed mitigation, the intersection would operate at an acceptable LOS E during the PM peak hour. The lengthened north and east crosswalks would increase traffic exposure time for pedestrians by 3 to 4 seconds, and 1 to 2 seconds for bicyclists. Existing bike lanes would be maintained. Secondary impacts to bicyclists and pedestrians would be minimal. The required right-of-way acquisition to accommodate the southbound right-turn lane and the second westbound through lane would displace homes and business parking, and remove trees. It is uncertain whether the required right-of-way can be acquired. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Mathilda Avenue & El Camino Real (#48) [CMP]

Potential Mitigation: Mitigation would require dedicated right-turn lanes on the northbound and eastbound legs. The westbound leg would require a second left-turn lane. The northbound curb lane should be modified to allow right-turn vehicles to get by the northbound through vehicles. The curb lane should be widened for approximately 200 feet, south to the beginning of the existing bike weaving area. The northbound leg can be restriped to accommodate the widened right-turn lane within the existing right-of-way. The eastbound right-turn lane would need to be approximately 500 feet long. The required right-of-way would need to be acquired from the southwest quadrant of the intersection. The second westbound left-turn lane would need to be the same length as the existing westbound left-turn lane. The second left-turn lane can be accommodated within the existing right-of-way through removing most of the landscaped median, as well as restriping and realigning the westbound leg.

With the proposed mitigation, the intersection would operate at an acceptable LOS E during the PM peak hour. Only the west crosswalk would be lengthened. The increased traffic exposure time for pedestrians ranges from 3 to 4 seconds, and 1 to 2 seconds for bicyclists. Existing bike facilities would be maintained at all legs. Secondary impacts to bicyclists and pedestrians would be minimal. The required right-of-way acquisition to accommodate the eastbound right-turn lane would displace businesses. It is uncertain whether the required right-of-way can be acquired. The intersection is controlled by Caltrans, so the City cannot ensure the implementation of the mitigation measures. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Mary Avenue & Central Expressway (52) [CMP]

Potential At-Grade Mitigation: At this intersection, a third westbound left-turn lane is identified as a Tier 3 project as part of the August 2015 update of the *County of Santa Clara Expressway Plan 2040*. The third westbound left-turn lane can be accommodated within the existing right-of-way. There would be minimal secondary impacts to pedestrian and bicyclists. However, a third westbound left-turn lane would not be enough to mitigate the cumulative impact. No further at-grade improvements are feasible at this intersection. Therefore, as a partial mitigation, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned third westbound left-turn lane at this intersection.

Potential Grade-Separation Mitigation: An interchange would eliminate the LUTE impact at this intersection. However, the County of Santa Clara currently has no plans to construct an interchange at this intersection.

Because there exists no feasible mitigation at this intersection to fully mitigate the intersection impact, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Mary Avenue & Fremont Avenue (#55)

Potential Mitigation: Mitigation would require construction of dedicated right-turn pockets on the northbound, eastbound, and westbound legs. The southbound leg would require widening to include a total of one left-turn lane, one through lane, one shared through-right lane, and one right-turn lane. All of the northbound, eastbound, and westbound right-turn pockets would need to be approximately 100 feet long. The bike lanes on all three legs should be striped on the inner side of the right-turn lane. The southbound right-turn lane would need to be 300 feet long. Additional right-of-way acquisition would be required at all four quadrants of the intersection. All crosswalks would be lengthened by 12 feet.

With the proposed mitigation, the intersection would operate at an acceptable LOS D during both the AM and PM peak hours. At all four crosswalks, the increased traffic exposure time for pedestrians ranges from 3 to 4 seconds, and 1 to 2 seconds for bicyclists. Existing bike facilities would be maintained at all legs. The southbound dual right-turns could create potential safety issues for pedestrians and bicyclists. Secondary impacts to bicyclists would be significant. The required right-of-way acquisition would displace businesses at the southern quadrants, and displace business parking at the northern quadrants. It is uncertain whether the required right-of-way can be acquired. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.



SR 85 Southbound Ramps & Fremont Avenue (#60)

Potential Mitigation: Mitigation would require widening the SR 85 off-ramp to include a left-turn lane, a shared left-through-right lane, and a right-turn lane. The eastbound leg would require restriping to include a bike box in advance of the stop-line to allow right-turn vehicles to bypass the through vehicles on the curb lane. The off-ramp would need to be widened to the proposed three lanes approximately 370 feet back from the intersection. The length of the north sidewalk would not be lengthened, but the pedestrian refuge island would be removed. The off-ramp would also need to be realigned with the SR 85 southbound on-ramp. Widening the off-ramp could be accommodated within the existing right-of-way. Within the existing right-of-way, the required eastbound right-turn lane could be achieved via providing a bike box east of the stop-line to allow bicyclists to clear the right-turn vehicles would be able to bypass the through vehicles. The existing stop-line for the eastbound leg would need to be moved back by approximately 15 feet. Widening the SR 85 off-ramp and providing the bike box on the eastbound leg would fully mitigate the impact during the AM peak hour. During the PM peak hour, the proposed mitigation measures would only partially mitigate the intersection.

Because there exists no feasible mitigation at this intersection to fully mitigate the PM peak hour intersection impact, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Cabrillo Avenue (#82) – City of Santa Clara

Potential At-Grade Mitigation: At-grade mitigation would require four mixed-flow lanes on Lawrence Expressway in both directions, as well as exclusive right-turn lanes on Cabrillo Avenue in both directions. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.
Lawrence Expressway & Benton Street (#84) – City of Santa Clara

Potential At-Grade Mitigation: At-grade mitigation would require four mixed-flow lanes on Lawrence Expressway in both directions, a second southbound left-turn lane, exclusive right-turn lanes on Benton Street in both directions, and a second westbound left-turn lane. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Homestead Road (#85) [CMP] – City of Santa Clara

Proposed At-Grade Mitigation: At-grade mitigation would require widening Lawrence Expressway to five mixed-flow lanes, and Homestead Road to three lanes. The northbound leg would require three left-turn lanes. The southbound leg would require two left-turn lanes. The eastbound leg would require two right-turn lanes. The westbound leg would require three left-turn lanes. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Pruneridge Avenue (#86) – City of Santa Clara

Proposed At-Grade Mitigation: At-grade mitigation would require widening Lawrence Expressway to four mixed-flow lanes. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Bowers Avenue & Central Expressway (#95) [CMP] – City of Santa Clara

Proposed At-Grade Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies a Tier 2 project to widen the eastbound leg to include a third left-turn lane. This identified mitigation measure would only partially mitigate the LUTE intersection impact. There exists no other feasible at-grade mitigation measure.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus a project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. Therefore, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Transportation Demand Management Program

Transportation Demand Management (TDM) is a combination of services, incentives, facilities, and actions that reduce single-occupant vehicle (SOV) trips to help relieve traffic congestion, parking demand, and air pollution. The purpose of TDM is to promote more efficient utilization of existing transportation facilities, and to ensure that new developments are designed to maximize the potential for sustainable transportation usage.

Sunnyvale typically requires new development to achieve between a 20% and 35% trip reduction depending on the type and location. At the following intersections, a TDM program within this range would be sufficient to mitigate the LUTE intersection impact through reducing the LUTE's traffic increase below the threshold for significant contribution. With a TDM program, the LUTE intersection impact at the following intersections would be *less than significant*. The intersection-specific minimum percent trip reductions required to eliminate the LUTE intersection impacts are listed below.

- Lawrence Expressway & Tasman Drive (#11) 33% trip reduction
- Duane Ave/Stewart Dr & Duane Avenue (#19) 34% trip reduction
- Wolfe Road & Fremont Avenue (#29) 33% trip reduction
- Fair Oaks Avenue & Arques Avenue (#31) 24% trip reduction
- Fair Oaks Avenue & El Camino Real (#34) 30% trip reduction
- Sunnyvale-Saratoga Road & Remington Drive (#40) 20% trip reduction
- Mathilda Avenue & El Camino Real (#48) 17% trip reduction
- Bowers Avenue & Central Expressway (#95) 9% trip reduction

At the nine remaining intersections with a LUTE intersection impact, a TDM program would not be sufficient to mitigate the intersection impacts through reducing the LUTE's contribution below the threshold for significant contribution or reducing the overall intersection volumes to a level that eliminates significant cumulative impacts. The LUTE intersection impact at all nine remaining intersections are considered **significant and unavoidable**.

CEQA Analysis – LUTE Cumulative Freeway Impacts

In analyzing the freeway segments, the STFM was used to project the increase in traffic volumes between existing and the 2035 proposed GP conditions. VTA's CMP guidelines require freeway levels of service to be calculated based on density. However, congested freeway speed (used to measure density) cannot be accurately modeled. For the purpose of this study, freeway levels of service under the 2035 proposed GP conditions are instead calculated based on volume to capacity (V/C) ratio. A freeway segment is assumed to operate at LOS F under the 2035 proposed GP conditions if,

- The freeway segment already operates at LOS F under existing conditions, or
- The STFM forecasts the freeway segment to operate at a V/C ratio above 1 under the 2035 proposed GP conditions.

All Santa Clara County, San Mateo County, and Alameda County guidelines define that a project would cause a freeway impact if it deteriorates freeway levels of service from an acceptable level to an unacceptable level, or if the freeway already operates at an unacceptable level under existing conditions the project would add traffic exceeding 1% (3% in Alameda County) of the capacity. However, because the freeway volume increase between existing and the 2035 proposed GP conditions is caused by a combination of the LSAP, PPSP, the proposed LUTE, and regional traffic, for the purpose of this report, the LUTE would generate a cumulative freeway impact only if the freeway segment is projected to operate at an unacceptable level under the 2035 proposed GP conditions, and the increase in LUTE volume exceeds 1% (3% in Alameda County) of capacity.

The following mixed-flow segments would operate at LOS F under the 2035 proposed GP conditions: Santa Clara County

- US 101, northbound from Silver Creek Valley Road to Mathilda Avenue, and from Moffett Boulevard to SR 85 AM Peak Hour
- US 101, northbound from SR 85 to Embarcadero Road AM & PM Peak Hours
- US 101, southbound from Embarcadero Road to Rengstorff Avenue, from Shoreline Boulevard to SR 237, and from Fair Oaks Avenue to Oakland Road PM Peak Hour
- SR 237, westbound from I-880 to First Street AM Peak Hour
- SR 237, westbound from First Street to Great America Parkway AM & PM Peak Hours
- SR 237, westbound from Fair Oaks Avenue to Mathilda Avenue, and from Maude Avenue to SR 85 PM Peak Hour
- SR 237, eastbound from Fair Oaks Avenue to Lawrence Expressway, and from Great America Parkway to First Street – AM & PM Peak Hours
- SR 237, eastbound from US 101 to Fair Oaks Avenue, from Lawrence Expressway to Great America Parkway, from First Street to Zanker Road, and from McCarthy Road to I-880 PM Peak Hour
- SR 85, northbound from Cottle Road to El Camino Real AM Peak Hour
- SR 85, southbound from US 101 to Fremont Avenue, from I-280 to Winchester Boulevard, and from SR 17 to Camden Avenue – PM Peak Hour
- SR 87, northbound from I-280 to US 101 AM Peak Hour
- SR 87, southbound from Skyport Drive to Taylor Street PM Peak Hour
- I-280, northbound from US 101 to SR 17, and from Winchester Boulevard to Foothill Expressway AM Peak Hour
- I-280, northbound from SR 17 to Winchester Boulevard AM & PM Peak Hours
- I-280, southbound from Page Mill Road to Magdalena Avenue, and from SR 85 to 10th Street PM Peak Hour
- I-880, northbound from I-280 to Stevens Creek Boulevard AM Peak Hour
- I-880, northbound from Stevens Creek Boulevard to Bascom Avenue, and from The Alameda to First Street – AM & PM Peak Hours
- I-880, northbound from Bascom Avenue to The Alameda, and from SR 237 to Dixon Landing Road PM Peak Hour
- I-880, southbound from Brokaw Road to Coleman Avenue AM & PM Peak Hours
- I-880, southbound from Montague Expressway to Brokaw Road, and from Coleman Avenue to Stevens Creek Boulevard – PM Peak Hour

San Mateo County

- US 101, between Embarcadero Road and SR 92 AM & PM Peak Hours
- I-280, between Alpine Road and SR 84 AM & PM Peak Hours

Alameda County

- I-880, northbound from Alvarado-Niles Road to Tennyson Road AM & PM Peak Hours
- I-880, northbound from Dixon Landing Road to Mission Boulevard PM Peak Hour
- I-880, southbound from SR 92 to Tennyson Road, from Industrial Boulevard to Whipple Road, and from Alvarado-Niles Road to Stevenson Boulevard AM Peak Hour
- I-880, southbound from Tennyson Road to Industrial Boulevard, and from Whipple Road to Alvarado-Niles Road – AM & PM Peak Hours
- I-880, southbound from Mission Boulevard to Dixon Landing Road PM Peak Hour

The following HOV segments would operate at LOS F under the 2035 proposed GP conditions: <u>Santa Clara County</u>

- US 101, northbound from Silver Creek Valley Road to Hellyer Avenue, from Capitol Expressway to Mathilda Avenue, from Ellis Street to Moffett Boulevard, and from Rengstorff Avenue to San Antonio Avenue AM Peak Hour
- US 101, northbound from SR 85 to Rengstorff Avenue, and from San Antonio Avenue to Embarcadero Road – AM & PM Peak Hours
- US 101, southbound from Embarcadero Road to SR 85 AM & PM Peak Hours
- US 101, southbound from Ellis Street to SR 237, from Mathilda Avenue to I-280, and from Story Road to Tully Road PM Peak Hour
- SR 237, westbound from I-880 to Mathilda Avenue AM Peak Hour
- SR 237, eastbound from Lawrence Expressway to I-880 PM Peak Hour
- SR 85, northbound from Blossom Hill Road to El Camino Real AM Peak Hour
- SR 85, southbound from SR 237 to Homestead Road, from I-280 to De Anza Boulevard, from Saratoga Road to Winchester Boulevard, from SR 17 to Union Avenue, and from Camden Avenue to Almaden Expressway – PM Peak Hour
- SR 87, northbound from Julian Street to US 101 AM Peak Hour
- I-280, northbound from Leigh Avenue to Winchester Boulevard, and from Saratoga Road to Lawrence Expressway – AM Peak Hour
- I-280, southbound from Winchester Boulevard to Leigh Avenue PM Peak hour
- I-880, northbound from SR 237 to Dixon Landing Road AM & PM Peak Hours
- I-880, southbound from Dixon Landing Road to SR 237, and from Brokaw Road to US 101 AM & PM Peak Hours
- I-880, southbound from Montague Expressway to Brokaw Road PM Peak Hour

San Mateo County

• US 101, between Embarcadero Road and Whipple Avenue – AM & PM Peak Hours

Alameda County

- I-880, northbound from Mission Boulevard to Fremont Boulevard (S), from Fremont Boulevard (N) to Alvarado-Niles Road, and from Tennyson Road to SR 92 – AM Peak Hour
- I-880, northbound from Decoto Road to Fremont Boulevard (N), and from Alvarado-Niles Road to Tennyson Road – AM & PM Peak Hours
- I-880, northbound from Dixon Landing Road to Mission Boulevard PM Peak Hour
- I-880, southbound from Stevenson Boulevard to Fremont Boulevard (S) AM Peak Hour
- I-880, southbound from Fremont Boulevard (S) to Mission Boulevard AM & PM Peak Hours
- I-880, southbound from Industrial Parkway to Fremont Boulevard (N) PM Peak Hour

LUTE - Significant Cumulative Freeway Impacts

A select zone analysis within the STFM was performed to estimate the increase in LUTE traffic volume between existing and the 2035 proposed GP conditions. The LUTE would generate a significant cumulative impact on the following mixed-flow segments under the 2035 proposed GP conditions, compared against existing conditions:

Santa Clara County

- US 101, northbound from Tully Road to Mathilda Avenue, and from Moffett Boulevard to SR 85 AM Peak Hour
- US 101, northbound from SR 85 to Embarcadero Road AM & PM Peak Hours
- US 101, southbound from Embarcadero Road to Oregon Expressway, from Shoreline Boulevard to Moffett Boulevard, from Ellis Street to SR 237, and from Fair Oaks Avenue to Oakland Road – PM Peak Hour
- SR 237, westbound from I-880 to First Street AM Peak Hour
- SR 237, westbound from First Street to Great America Parkway AM & PM Peak Hours
- SR 237, westbound from Fair Oaks Avenue to Mathilda Avenue, and from Maude Avenue to SR 85 PM Peak Hour
- SR 237, eastbound from Fair Oaks Avenue to Lawrence Expressway, and from Great America Parkway to First Street AM & PM Peak Hours
- SR 237, eastbound from US 101 to Fair Oaks Avenue, from Lawrence Expressway to Great America Parkway, from First Street to Zanker Road, and from McCarthy Road to I-880 PM Peak Hour
- SR 85, northbound from Almaden Expressway to SR 17, and from Saratoga Road to El Camino Real

 AM Peak Hour
- SR 85, southbound from US 101 to Fremont Avenue, from I-280 to Winchester Boulevard, and from SR 17 to Camden Avenue – PM Peak Hour
- SR 87, southbound from Skyport Drive to Taylor Street PM Peak Hour
- I-280, northbound from US 101to SR 17, from Winchester Boulevard to De Anza Boulevard, and from SR 85 to Foothill Expressway – AM Peak Hour
- I-280, northbound from SR 17 to Winchester Boulevard AM & PM Peak Hours
- I-280, southbound from Page Mill Road to Magdalena Avenue, and from SR 85 to 10th Street PM Peak Hour
- I-880, northbound from Coleman Avenue to First Street AM & PM Peak Hours
- I-880, northbound from The Alameda to Coleman Avenue, and from SR 237 to Dixon Landing Road PM Peak Hour
- I-880, southbound from Brokaw Road to Old Bayshore Highway, and from US 101 to Stevens Creek Boulevard – PM Peak Hour

San Mateo County

- US 101, northbound from Embarcadero Road to Whipple Avenue AM & PM Peak Hours
- US 101, northbound from Whipple Avenue to Ralston Avenue PM Peak Hour
- US 101, southbound from SR 92 to Marsh Road, and from Willow Road to Embarcadero Road AM Peak Hour
- US 101, southbound from Marsh Road to Willow Road AM & PM Peak Hours
- I-280, between Alpine Road and SR 84 PM Peak Hour

Alameda County

- I-880, southbound from SR 92 to Whipple Road, and from Whipple Road to Stevenson Boulevard AM Peak Hour
- I-880, southbound from Whipple Road to Alvarado-Niles Road AM & PM Peak Hours



The LUTE would generate a significant cumulative impact on the following HOV segments under the 2035 proposed GP conditions, compared against existing conditions:

Santa Clara County

- US 101, northbound from Tully Road to Mathilda Avenue, and from Ellis Street to Moffett Boulevard AM Peak Hour
- US 101, northbound from SR 85 to Rengstorff Avenue, and from San Antonio Avenue to Embarcadero Road – PM Peak Hour
- US 101, southbound from Embarcadero Road to San Antonio Road AM Peak Hour
- US 101, southbound from San Antonio Road to SR 85 AM & PM Peak Hours
- US 101, southbound from Mathilda Avenue to I-280, and from Story Road to Tully Road PM Peak Hour
- SR 237, westbound from I-880 to Mathilda Avenue AM Peak Hour
- SR 237, eastbound from Lawrence Expressway to I-880 PM Peak Hour
- SR 85, northbound from Blossom Hill Road to SR 87, and from SR 17 to El Camino Real AM Peak Hour
- SR 85, southbound from SR 237 Homestead Road, and from I-280 to De Anza Boulevard PM Peak Hour
- SR 87, northbound from Julian Street to US 101 AM Peak Hour
- I-280, northbound from Leigh Avenue to Winchester Boulevard, and from Saratoga Road to Lawrence Expressway – AM Peak Hour
- I-280, southbound from Winchester Boulevard to Leigh Avenue PM Peak hour
- I-880, northbound from SR 237 to Dixon Landing Road AM & PM Peak Hours

San Mateo County

- US 101, northbound from Willow Road to Whipple Avenue AM & PM Peak Hours
- US 101, northbound from Embarcadero Road to Willow Road PM Peak Hour
- US 101, southbound from Whipple Avenue to Embarcadero Road AM Peak Hour

Alameda County

- I-880, northbound from Mission Boulevard to Fremont Boulevard (S) AM Peak Hour
- I-880, northbound from Decoto Road to Fremont Boulevard (N) AM & PM Peak Hours
- I-880, northbound from Alvarado-Niles Road to Whipple Road PM Peak Hour
- I-880, southbound from Stevenson Boulevard to Fremont Boulevard (S) AM Peak Hour
- I-880, southbound from Fremont Boulevard (S) to Mission Boulevard AM & PM Peak Hours
- I-880, southbound from Industrial Parkway to Fremont Boulevard (N) PM Peak Hour

The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along SR 237 between N. First Street and SR 85, along US 101 between Cochrane Road and Whipple Avenue, along I-280 between Leland Avenue and Magdalena Avenue, along I-880 between the Alameda County Line and US 101, and along all of SR 87 and SR 85. The Metropolitan Transportation Commission (MTC) plans to convert the existing HOV lanes into express lanes on I-880 between Marina Boulevard and Dixon Landing Road. On all identified freeway segments, the existing HOV lanes are proposed to be converted to express lanes. On US 101 and SR 85 along the identified segments, a second express lane is proposed to be implemented in each direction for a total of two express lanes.

On SR 237, I-280, I-880, and SR 87, the existing HOV lanes would already be operating over capacity under the 2035 proposed GP conditions. Converting the HOV lanes to express lanes would not mitigate the project impact. On US 101 and SR 85, converting the existing HOV lane to an express lane and adding an express lane in each direction would increase the capacity of the freeway and would fully mitigate the freeway impacts. Future projects consistent with the proposed LUTE should make a fair-share contribution toward the cost of the identified express lane program along US 101 and SR 85.

However, capacity improvements on freeways are beyond the capabilities of the City of Sunnyvale. Furthermore, freeways are under Caltrans jurisdiction. Therefore, the freeway impacts would be *significant and unavoidable.*

LUTE Intersection Deficiencies – Compared to Current GP Conditions

The 2035 proposed GP conditions are compared to current GP conditions to determine LUTE deficiencies. This analysis is not required by CEQA, and is for information only.

The methodology for determining LUTE intersection deficiencies and cumulative intersection deficiencies in this section is similar to the methodology for the CEQA analysis (discussed at the beginning of this chapter), except the percent contributions are derived by comparing volumes associated with only the LSAP, the PPSP, and the proposed LUTE between the 2035 proposed GP and the current GP conditions. Between the current GP and the 2035 proposed GP conditions, it is assumed that growth outside of Sunnyvale stays constant.

LUTE Intersection Deficiencies

Based on the methodology for determining LUTE intersection deficiencies, the LUTE would result in intersection deficiencies at the following study intersections when compared against the Current GP conditions:

- Lawrence Expressway & Tasman Drive (#11) AM Peak Hour
- Lawrence Expressway & Lakehaven Drive (#12) AM & PM Peak Hours
- Duane Ave/Stewart Dr & Duane Avenue (#19) AM Peak Hour
- Wolfe Road & Fremont Avenue (#29) PM Peak Hour
- Fair Oaks Avenue & Arques Avenue (#31) AM & PM Peak Hours
- Fair Oaks Avenue & El Camino Real (#34) PM Peak Hour
- Sunnyvale-Saratoga Road & Remington Drive (#40) PM Peak Hour
- Mathilda Avenue & El Camino Real (#48) PM Peak Hour
- Hollenbeck Avenue & El Camino Real (#49) PM Peak Hour
- Mary Avenue & Maude Avenue (#51) PM Peak Hour
- Mary Avenue & Central Expressway (#52) PM Peak Hours
- Mary Avenue & El Camino Real (#54) PM Peak Hour
- Mary Avenue & Fremont Avenue (#55) AM & PM Peak Hours
- SR 85 Southbound Ramps & Fremont Avenue (#60) AM & PM Peak Hours
- Lawrence Expressway & Cabrillo Avenue (#82) AM Peak Hour
- Lawrence Expressway & Benton Street (#84) AM & PM Peak Hours
- Lawrence Expressway & Pruneridge Avenue (#86) PM Peak Hour

Fourteen of the intersections with LUTE intersection deficiencies when compared to current GP conditions also have LUTE intersection impacts under the CEQA analysis (when compared to existing conditions). The intersections of Hollenbeck Avenue and El Camino Real, of Mary Avenue and Maude Avenue, and of Mary Avenue and El Camino Real would have LUTE intersection deficiencies when compared to current GP conditions, but would not have LUTE intersection impacts under the CEQA analysis. The intersections of Lawrence Expressway and Oakmead Parkway, of Lawrence Expressway Homestead Road, and of Bowers Avenue and Central Expressway would have LUTE intersection impacts under the CEQA analysis, but not when compared to the current GP conditions.

Potential Improvement Strategies for LUTE Deficiencies – Compared to Current GP Conditions

At ten of the intersections with a LUTE deficiency, the improvement discussion is the same as under the CEQA analysis. These ten intersections are listed below:

- Lawrence Expressway & Tasman Drive (#11)
- Lawrence Expressway & Lakehaven Drive (#12)
- Duane Ave/Stewart Dr & Duane Avenue (#19)
- Fair Oaks Avenue & El Camino Real (#34)
- Sunnyvale-Saratoga Road & Remington Drive (#40)
- Mathilda Avenue & El Camino Real (#48)
- Mary Avenue & Central Expressway (#52)
- Lawrence Expressway & Cabrillo Avenue (#82)
- Lawrence Expressway & Benton Street (#84)
- Lawrence Expressway & Pruneridge Avenue (#86)

Discussed below are potential improvement measures for the remaining seven intersections with a LUTE deficiency. Four of the intersections were also identified with a LUTE intersection impact under the CEQA analysis, but the required improvement when compared to the current GP conditions is less than under the CEQA analysis. The remaining three intersections were not identified with a LUTE intersection impact under the CEQA analysis.

Wolfe Road & Fremont Avenue (#29)

Potential Improvement: Improvement would require construction of an exclusive southbound rightturn lane for the length of the segment. The eastbound inner left-turn lane would require restricting the U-turn movement to allow for a southbound overlap right-turn phase. Depending on the extent of the median on the north leg that could be removed, the north leg would be widened between 3 to 11 feet. The north leg would be realigned to accommodate the southbound right-turn. There is existing right-of-way on the northeast quadrant of the intersection.

With the proposed improvement, the intersection would operate at an unacceptable LOS E during the PM peak hour, but would not cause a deficiency when compared to the current GP conditions. Under the CEQA analysis, a second northbound left-turn lane would also be required to fully mitigate the LUTE intersection impact. The second northbound left-turn lane is not required to eliminate the LUTE intersection deficiency when compared to the current GP. Secondary impacts associated with this mitigation on the pedestrian and bicycle facilities would not be significant. The increased exposure time ranges from approximately 1 to 3 seconds for pedestrians and 1 to 2 seconds for bicyclists. This increased exposure time is minimal. The required right-of-way acquisition would be minimal and would not displace businesses.

Fair Oaks Avenue & Arques Avenue (#31)

Potential Improvement: Improvement would require construction of dedicated right-turn pockets on the southbound and westbound legs. The southbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket would require additional right-of-way acquisition and displacement of business parking. The southbound right-turn pocket would also widen the north crosswalk by approximately 12 feet. The westbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket could be accommodated through removing the inner east receiving lane for approximately 150 to 200 feet in length. The westbound lanes would all be shifted south by lane to accommodate the right-turn pocket. Removing the inner east receiving lane would not cause secondary impacts because all other three legs only have one lane feeding into the east receiving lanes. The eastbound through lane would require re-aligning. Since the westbound right-turn pocket can be accommodated within the existing right-of-way, there would be minimal secondary impacts to pedestrians and bicyclists.

With the proposed improvement, the intersection would operate at an unacceptable LOS E during both the AM and PM peak hours, but would not cause a deficiency when compared to the current GP conditions. The eastbound right-turn pocket, which would be required as an improvement under the CEQA analysis, is not needed to eliminate the LUTE deficiency when compared to the current GP conditions. The westbound right-turn pocket could be accommodated within the existing right-of-way, and would not cause secondary deficiencies to pedestrians and bicyclists. The southbound right-turn pocket would displace approximately half of the parking spaces for the business at the northwest corner of the intersection. The increased exposure time to traffic ranges from approximately 3 seconds for pedestrians and 2 seconds for bicyclists, which is minimal. It is uncertain whether the City of Sunnyvale would be able to acquire the required right-of-way for the southbound right-turn pocket.

Hollenbeck Avenue & El Camino Real (#49) [CMP]

Potential Improvement: Improvement would require restriping the southbound leg to include two left-turn lanes, one through lane, and one shared through-right lane. Hollenbeck Avenue would require realignment for the through lanes. No additional right-of-way acquisition would be required.

With the proposed improvement, the intersection would operate at an acceptable LOS E during the PM peak hour. The existing pedestrian and bicycle facilities would be maintained. However, the intersection is controlled by Caltrans, so the City cannot ensure the implementation of the improvement measures.

Mary Avenue & Maude Avenue (#51)

Potential Improvement: Improvement would require construction of dedicated right-turn lanes on the southbound and eastbound legs. The southbound right-turn lane would need to be approximately 100 feet long. The eastbound right-turn lane would need to be approximately 300 feet long. Both right-turn lanes would need to be constructed on the right side of the bike lanes to minimize weaving with bicyclists. The west leg has a wide neck and the crosswalk would not require widening to accommodate the eastbound right-turn lane. The north crosswalk would require widening by approximately 12 feet to accommodate the southbound right-turn lane. Additional right-of-way acquisition would be required.

With the proposed improvement, the intersection would operate at an acceptable LOS D during the PM peak hour. Secondary deficiencies to bicyclists could be minimized if the weaving section between the right-turn vehicles and bicyclists were maintained at the existing length. Secondary deficiencies to pedestrians would include increased pedestrian exposure time to traffic of approximately 4 seconds on the north crosswalk. The required right-of-way acquisition would not displace business or parking spaces, but would require the removal of three trees as well as removing most of the landscaping buffer for the detached sidewalk on the west leg, which would be in conflict with the PPSP planned street framework on Maude Avenue.

Mary Avenue & El Camino Real (#54) [CMP]

Potential Improvement: Improvement would require construction of dedicated right-turn lanes on the southbound and eastbound legs. The southbound right-turn lane would need to be approximately 200 feet long. The north leg would need to be widened by 10 feet to accommodate the right-turn lane. The eastbound right-turn lane would need to be approximately 350 feet long. The west leg would need to be widened by 5 feet to accommodate the right-turn lane. The north and west legs both have wide necks, so the crosswalks would not require widening. Additional right-of-way acquisition would be required.

With the proposed improvement, the intersection would operate at an acceptable LOS E during the PM peak hour. Secondary deficiencies to bicyclists would be minimal. The proposed right-turn lanes would remove all of the landscape buffers between the business parking spaces and the sidewalk. Business parking spaces may need to be displaced to maintain the existing sidewalk buffer zone. Moreover, the intersection is controlled by Caltrans, so the City cannot ensure the implementation of the improvements

Mary Avenue & Fremont Avenue (#55)

Potential Improvement: Improvement would require construction of a second southbound left-turn lane. Both left-turn lanes would need to be 350 feet long. The north leg crosswalk would need to be widened by 12 feet. Additional right-of-way acquisition would be required.

With the proposed improvement, the intersection would operate at LOS E during the AM peak hour, and LOS F during the PM peak hour, but would not cause a deficiency when compared to the current GP conditions. Under the CEQA analysis, the intersection also required dedicated right-turn lanes on all legs. These improvements are not required to eliminate the LUTE intersection deficiency when compared against the current GP conditions. Pedestrian and bicyclist exposure time to traffic while crossing the north leg would be increased by 3 to 4 seconds. This secondary impact would be minimal. However, the required right-of-way acquisition would displace business parking spaces and remove trees. It is uncertain whether the City can acquire the required right-of-way.

SR 85 Southbound Ramps & Fremont Avenue (#60)

Potential Improvement: Improvement would require widening the SR 85 off-ramp to include a leftturn lane, a shared left-through-right lane, and a right-turn lane. The off-ramp would need to be widened to the proposed three lanes approximately 370 feet back from the intersection. The length of the north sidewalk would not be lengthened, but the pedestrian refuge island would be removed. The off-ramp would also need to be realigned with the SR 85 southbound on-ramp. Widening the offramp could be accommodated within the existing right-of-way.

With the proposed improvement, the intersection would operate at LOS E during the AM peak hour and LOS F during the PM peak hour. Under the CEQA analysis, the intersection also required a bike box on the eastbound leg. This improvement is not required to eliminate the LUTE intersection deficiency when compared to the current GP conditions. Widening the SR 85 off-ramp would not require additional acquisition of right-of-way, and would have minimal deficiencies to pedestrians and bicyclists. However, the SR 85 southbound ramp is not within City jurisdiction, so the City cannot ensure the implementation of any improvement measures.

LUTE Cumulative Freeway Traffic – Compared to Current GP Conditions

The methodology used to identify LUTE cumulative freeway added traffic when compared to the current GP conditions assumes the same as the methodology under the CEQA analysis (when compared against existing conditions), except the increase in LUTE traffic volume is estimated between the current GP and the 2035 proposed GP conditions.

The LUTE would cause deficiencies on the following mixed-flow freeway segments compared against the current GP conditions:

Santa Clara County

- US 101, northbound from Tully Road to Story Road, and from I-280 to Mathilda Avenue AM Peak Hour
- US 101, northbound from SR 85 to Embarcadero Road AM & PM Peak Hours
- US 101, southbound from Shoreline Boulevard to Moffett Boulevard, from Ellis Street to SR 237, and from Fair Oaks Avenue to San Tomas Expressway PM Peak Hour
- SR 237, westbound from I-880 to Great America Parkway AM Peak Hour
- SR 237, westbound from Fair Oaks Avenue to Mathilda Avenue, and from Maude Avenue to SR 85 PM Peak Hour
- SR 237, eastbound from Fair Oaks Avenue to Lawrence Expressway, and from Great America Parkway to First Street – AM & PM Peak Hours
- SR 237, eastbound from US 101 to Fair Oaks Avenue, from Lawrence Expressway to Great America Parkway, from First Street to Zanker Road, and from McCarthy Road to I-880 PM Peak Hour
- SR 85, northbound from Saratoga Road to El Camino Real AM Peak Hour
- SR 85, southbound from US 101 to Fremont Avenue, and from I-280 to Saratoga Road PM Peak Hour
- I-280, northbound from 10th Street to Meridian Avenue, and from Saratoga Road to De Anza Boulevard – AM Peak Hour
- I-280, southbound from Page Mill Road to Magdalena Avenue, and from SR 85 to Wolfe Road PM Peak Hour
- I-880, northbound from Coleman Avenue to First Street PM Peak Hour

San Mateo County

- US 101, northbound from Embarcadero Road to Willow Road AM & PM Peak Hours
- US 101, southbound from Ralston Avenue to Embarcadero Road AM Peak Hour

All freeway mixed-flow segments with a LUTE cumulative deficiency when compared against the current GP conditions are also identified under the CEQA analysis.

The LUTE would cause deficiencies on the following HOV segments under the 2035 proposed GP conditions, compared against existing conditions:

Santa Clara County

- US 101, northbound from I-880 to Mathilda Avenue AM Peak Hour
- US 101, northbound from SR 85 to Rengstorff Avenue, and from San Antonio Avenue to Embarcadero Road – PM Peak Hour
- US 101, southbound from Embarcadero Road to San Antonio Road AM Peak Hour
- US 101, southbound from San Antonio Road to SR 85 AM & PM Peak Hours
- US 101, southbound from Mathilda Avenue to I-280, and from Story Road to Tully Road PM Peak Hour
- SR 237, westbound from I-880 to Mathilda Avenue AM Peak Hour
- SR 237, eastbound from Lawrence Expressway to I-880 PM Peak Hour
- SR 85, northbound from SR 17 to El Camino Real AM Peak Hour
- SR 85, southbound from SR 237 Homestead Road, and from I-280 to De Anza Boulevard PM Peak Hour
- SR 87, northbound from Julian Street to US 101 AM Peak Hour
- I-280, northbound from I-880 to Winchester Boulevard, and from Saratoga Road to Lawrence Expressway – AM Peak Hour
- I-880, northbound from SR 237 to Dixon Landing Road PM Peak Hour

San Mateo County

- US 101, northbound from Embarcadero Road to Marsh Road PM Peak Hour
- US 101, southbound from Whipple Avenue to Embarcadero Road AM Peak Hour

All freeway HOV segments with a LUTE cumulative freeway deficiency when compared against the current GP conditions are also identified under the CEQA analysis.



The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along SR 237 between N. First Street and SR 85, along US 101 between Cochrane Road and Whipple Avenue, along I-280 between Leland Avenue and Magdalena Avenue, along I-880 between the Alameda County Line and US 101, and along all of SR 87 and SR 85. The Metropolitan Transportation Commission (MTC) plans to convert the existing HOV lanes into express lanes on I-880 between Marina Boulevard and Dixon Landing Road. On all identified freeway segments, the existing HOV lanes are proposed to be converted to express lanes. On US 101 and SR 85 along the identified segments, a second express lane is proposed to be implemented in each direction for a total of two express lanes.

On SR 237, I-280, I-880, and SR 87, the existing HOV lanes would already be operating over capacity under the 2035 proposed GP conditions. Converting the HOV lanes to express lanes would not eliminate the LUTE cumulative freeway deficiency. On US 101 and SR 85, converting the existing HOV lane to an express lane and adding an express lane in each direction would increase the capacity of the freeway and would eliminate the LUTE cumulative freeway deficiency. Future projects consistent with the proposed LUTE should make a fair-share contribution toward the cost of the identified express lane program along US 101 and SR 85.

2035 Proposed GP Freeway Ramp Capacity Analysis

Under the 2035 proposed GP conditions, the SR 237/Mathilda Avenue and US 101/Mathilda Avenue interchanges are proposed for reconfiguration. These interchange improvements are identified in the Valley Transportation Plan 2040 (project H33). At the time of this report, the proposed configurations at these interchanges are still not finalized. The two interchange improvement alternatives being studied (documented in the *Notice of Preparation of an Environmental Impact Report*, released on August 18, 2015) are different at only the SR 237/Mathilda Avenue interchange (diamond interchange versus diverging diamond interchange). The alternatives would differ from an operational perspective, but would not differ from a demand forecasting perspective. At the US 101/Mathilda Avenue interchange, the interchange would be reconfigured to a partial cloverleaf interchange. The US 101 northbound and southbound off-ramps would be improved to allow full access onto Mathilda Avenue. The existing US 101 northbound off-ramp to southbound Mathilda Avenue would be demolished. This study assumes the configuration proposed under the *Notice of Preparation of an Environmental* 18, 2015.

At the interchange of SR 237/Middlefield Road, the SR 237 westbound off-ramp is proposed to be realigned with Ferguson Drive to the west. The existing SR 237 westbound on-ramp would have access restricted to only eastbound Middlefield Road. As part of the same improvement project, a new loop on-ramp is proposed to connect westbound Middlefield Road to westbound SR 237. This interchange improvement is identified in the VTP 2040 (project H32).

The 2035 proposed GP conditions freeway ramp volumes were forecasted using the STFM and adjusted based on existing ramp volumes, where applicable. All interchange improvements listed above are assumed completed. The ramp analysis showed that under the 2035 proposed GP conditions, all ramps would operate below capacity. Therefore, the LUTE impact on freeway ramps would be *less than significant*.

LUTE Cumulative Impacts to Transit Facilities

Impacts to Transit Travel Times

Traffic from the LUTE buildout under the 2035 proposed GP conditions would have a significant impact at seventeen intersections when compared to existing conditions. Currently, all but the SR 85 SB ramps and Fremont Avenue intersection are on one or more bus routes. The intersection delays at sixteen impacted intersections would significantly impact transit travel times. As discussed above, there exist feasible mitigations at only the intersections of Duane Ave/Stewart Dr and Duane Avenue, and of Wolfe Road and Fremont Avenue. A TDM program with a 20% to 35% trip reduction target would eliminate the intersection impacts at six more intersections. With the proposed mitigation measures, the LUTE cumulative impact to transit travel times at these eight intersections would be *less than significant*. For the remaining eight impacted intersections, the LUTE cumulative impact to transit travel times would be **significant and unavoidable**.

Impacts to Transit Facilities

Existing transit lines provide services in the City of Sunnyvale mainly with a 30- to 60-minute headway during the AM and PM peak hours. In conjunction with the TDM policies (with a trip reduction target of 20-35%), it is expected that the LUTE would increase transit demand that may not be accommodated by the existing transit services. It is recommended that the City work with VTA to increase transit services within the City of Sunnyvale.

The draft LUTE document identifies various policies and actions to expand and enhance the transit network within Sunnyvale, as well as creating transit-friendly streets to improve transit travel times and transit stop facilities. The specific relevant policies are listed in Chapter 4.

It is expected that the LUTE would increase the number of Caltrain riders. Caltrain has plans to increase the number of trains serving the Sunnyvale Caltrain Station from the existing 62 trains per day to 84 trains per day during weekdays, and increase service at Lawrence Station from the existing 56 trains per day to 66 trains per day during weekdays. It is assumed that the planned increase in service will be sufficient to meet the demand.

With the implementation of these policies, the LUTE impact to transit facilities would be less than significant.

LUTE Cumulative Impacts to Pedestrian and Bicycle Facilities

The draft LUTE document identifies various policies and plans to improve pedestrian and bicycle facilities within the City of Sunnyvale. The implementation of these policies would close existing sidewalk gaps, build new pedestrian connections, enhance pedestrian intersection crossings, and enhance pedestrian comfort level on sidewalks. Connectivity and safety for the bicycle network would also be improved. Therefore, the LUTE cumulative impact on pedestrian and bicycle facilities would be *less than significant*.

Table ES-1 Intersection Levels of Service Summary

				Existing	Curren	nt GP		20	35 Pro	oposed	I GP compare	d to Existir	ig Con	ditions		2	035 F	ropo	sed GP o	compared to Cu	rent GP (ondition	ns
								I	ncr.									Incr.					
		D I-	0	Avg.	Avg.		Avg.	In	Crit.	Incr.	Threshold	Ber			1	Avg.		n Crit	Incr.	Threshold for	B		
# Intersection	СМР	Peak Hour	Date	(sec) LOS	(sec)	LOS	(sec)	LOS (elay sec)	V/C	Contribution	LUTE F	PSP	LSAP	n Regional	Delay I (sec)	LOS	Delay (sec)	V/C	Considerable	LUTE	PPSP	LSAP
1 Mathilda Ave & Java Dr	*	AM	01/00/15	26.6 C	25.2	С	36.3	D+ '	13.6	0.609						36.3	D+	16.1	0.279				
2 Mathilda Ave & 5th Ave	+	AM	06/04/15	13.5 B	15.0	B	18.8	B-	9.9 8.7	0.367						18.8	B-	5.2	0.086				
3 Mathilda Ave & Innovation Way	+	AM	06/04/15	18.5 B-	17.3	B	18.1	B- ·	-1.9	0.200						18.1	B-	-0.9 1.7	0.065				
⁴ Mathilda Ave & SR 237 WB ²	+	AM	06/04/15	- E	- 20.6	D	-	D	-	-						-	D	-	-				
⁵ Mathilda Ave & SR 237 EB ²	+	AM	06/04/15	- E	-	D	-	D	-	-						-	D	-	-				
6 Crossman Ave & Caribbean Dr	+	AM	05/14/15	- E 10.3 B+	23.6	C	13.2	B ·	-5.5	0.242						13.2	B	-21.6	0.122				
7 Crossman Ave & Java Dr		AM	11/00/14	17.0 B	24.6	C	19.5	В- р	2.7	0.476						19.5	B-	-13.8	-0.043				
8 Fair Oaks Ave & Tasman Dr		AM	06/04/15	17.1 B	20.0	C+	22.4	C+	5.9	0.334						22.4	C+	3.3	0.033				
9 Fair Oaks Ave & Weddell Dr		AM	06/04/15	19.0 B-	24.6	C	23.8	C	4.2	0.126						23.8	C	-0.5	0.012				
10 N Fair Oaks Ave & US 101 NB		AM	10/00/14	16.5 B	49.1	D	54.2	D- 6	0.0 65.6 72.5	0.422						54.2	D-	2.2	0.003				
11 Lawrence Expwy & Tasman Dr	*	AM	05/18/15	40.2 D	58.6	E+	92.7	F 1	33.9	0.230	80%	77%	8%	6% 3%	9% 14%	92.7	F	89.1	0.093	60%	66%	19%	15%
12 Lawrence Expwy & Lakehaven Dr	+	AM	05/18/15	59.6 E+	72.3	E	84.9	F 2	20.8	0.335	90%	80%	5% 5%	8% 5%	7%	84.9	F	18.3	0.263	50%	65%	13%	22%
13 Lawrence Expwy & US 101 NB	+	AM	05/22/15	21.7 C+	48.3	D	67.9	E t	51.7	0.365	30%	1170	570	370	1070	67.9	E	14.4	0.040	2070	0070	1070	1370
14 Lawrence Expwy & US 101 SB	+	AM	05/18/15	15.1 B	11.4	B+ C-	20.5	C+	9.1 -8.9	0.250						20.5	C+	13.0	0.051				
15 Lawrence Expwy & Oakmead Pkwy	+	AM	05/18/15	48.7 D	148.1	F	150.6	F 1	42.3	0.418	40%	70%	6% 5%	11%	13% 17%	150.6	F	-15.6	-0.022				
16 Lawrence Expwy & Arques Ave ³	*	AM	05/18/15	66.6 E	28.2	C F	46.5	D -	25.2	0.188	90%	66%	6%	8%	20%	46.5	DF	29.9	0.252				
17 Lawrence Expwy & Kifer Rd ³	+	AM	05/18/15	168.2 F 81.0 F	83.5 46.9	F D	64.7 29.8	E -	82.0 37.5	0.199	00,0	0070	570	0,0	2070	64.7 29.8	E C	-34.7	-0.139				
18 Lawrence Expwy & Reed Ave/Monroe St ³	*	AM PM	05/18/15 05/18/15	203.1 F 86.5 F	48.7 28.4	D C	51.7 29.4	D3 C -	329.3 90.9	0.207 -0.104						51.7 29.4	D- C	0.6 -2.1	0.012				
Notes:																							

Notes:

Denotes CMP intersection (LOS E threshold)

Denotes an intersection on a CMP roadway (LOS E threshold)

1. The percent contributions are calculated for all approaches (unweighted) and relate to LSAP, Proposed LUTE, PPSP Project Trips and/or regional future traffic.

2. At the intersections at the Mathilda/SR 237 interchange, the calculated LOS does not reflect the unmet vehicle demand that cannot get through the intersections during the peak hours. The LOS reflect the micro-simulation analysis results using Synchro/Sim Traffic software. The Mathilda/SR 237 interchange is expected to be reconstructed under the current GP and 2035 proposed GP conditions. The proposed lane geometry at the intersections are not finalized at the time of this report. It is assumed that these two intersections would operate at an acceptable LOS D in year 2035.

3. The intersections of Lawrence/Arques, Lawrence/Kifer, and Lawrence/Reed-Monroe all assume grade separations for all future scenarios.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact



March 23, 2016

Table ES-1 (Continued) Intersection Levels of Service Summary

			Existing	Current	GP		20	35 Propose	d GP compare	d to Exist	ing Con	ditions		2	035 Prop	osed GP	compared to Cu	rrent GP	Condition	ns
			Avg.	Avg.		Avg.	l In	ncr. Crit. Incr.	Threshold					Avg.	Incı In Cr	it. Incr.	Threshold for			
# Intersection	Peak CMP Hour	Count	Delay (sec) LOS	Delay	20	Delay		Delay In Crit	. for Sig.	Pe	rcent C	ontributi	on ¹ Regiona	Delay	Dela	y In Crit	Considerable	Percei	nt Contril	bution ¹
19 Duene/Stawart & Duene Ave		10/00/14	31.4 C	110.1	= [113.3	E 1	20.3 0.396	5.0%	76%	5%	6%	13%	113.3	E 73	0.032	50%	68%	10%	13%
13 Duane/Stewart & Duane Ave	PM	10/00/14	30.6 C	32.7 (с- I	32.6	C-	1.7 0.175	5070	1070	570	070	1070	32.6	C1.2	0.003	30%	0070	1370	1070
20 N Fair Oaks Ave & Duane Ave	AM PM	10/00/14	26.3 C 32.1 C-	32.5 (43.0	C- D	47.1 54.3	D 4	41.6 0.376 42.4 0.359						47.1 54.3	D 27.	6 0.131 8 0.092				
21 Fair Oaks Ave & Maude Ave ²	AM	N/A	28.6 C	32.5 (C-	34.9	C- 1	11.3 0.352						34.9	C- 4.6	0.122				
22 Wolfe Rd & Stewart Dr	PM AM	N/A 10/00/14	28.5 C 16.1 B	36.3 L 23.3	C C	37.5 26.2	C ·	12.4 0.186 13.1 0.266						37.5 26.2	D+ 1.9 C 4.3	0.023				
23 Wolfe Ed & Argues Ave	PM	10/00/14	19.1 B-	22.9 C	C+	25.7	C	7.2 0.220	80%	55%	7%	17%	21%	25.7	C 2.6	0.026	60%	11%	21%	35%
23 Wolle Ru & Alques Ave	PM	10/00/14	24.0 C 28.4 C	40.5 39.1	D	49.8	D :	31.1 0.507	00 /0	5570	1 /0	17 70	2170	49.8	D 16.4	0.138	00%	44 /0	2170	55%
24 Wolfe Rd & Kifer Rd	AM PM	05/00/14	21.1 C+ 26.8 C	34.2 (C- F	124.5	F 1	40.5 0.755	60% 60%	38% 53%	7% 7%	39% 30%	16% 10%	124.5	F 125	9 0.334	30%	18%	15%	67%
25 Wolfe Rd & Evelyn Ave	AM	05/00/14	26.0 C	52.4	. L D-	44.5	D :	25.2 0.470	00,0	0070	170	0070	1070	44.5	D -13.	0 -0.034				
26 Wolfe Rd & Reed Ave	PM AM	05/00/14	24.6 C 28.8 C	44.9	D D	51.6 55.8	E+ 4	41.6 0.526	90%	51%	8%	21%	20%	51.6 55.8	E+ 22.	0.049 0.106	90%	23%	33%	44%
27. Euclas Aug & Deed Aug	PM	05/00/14	28.8 C	42.1	D .	51.9	D- :	37.0 0.373	_					51.9	D- 15.	0.052	-			
27 Evelyn Ave & Reed Ave	PM	05/14/15	10.6 Б+ 18.9 В-	18.1 E	5+ B-	12.3	ь В-	2.0 0.105						12.5	Б I.I B- 0.3	0.030				
28 Wolfe Rd & El Camino Real	* AM	05/00/14	49.8 D	56.4 E	=+	60.2	E	23.3 0.312						60.2	E 12.	0.085				
29 Wolfe Rd & Fremont Ave	AM	05/00/14	48.9 D	60.9	E [63.0	E '	12.4 0.270	50%	66%	5%	11%	18%	63.0	E 2.9	0.013	_		_	
30 Wolfe Pd & Homesteed Pd	PM	05/00/14	49.8 D	87.6	F [105.8	F 1	04.7 0.471	50%	75%	3%	9%	13%	105.8	F 31.	0.063	10%	82%	6%	12%
30 Wolle Ru & Hollesteau Ru	PM	05/00/14	31.9 C	37.9 E)+	42.5	D 2	20.1 0.398						42.5	D 8.6	0.047				
31 Fair Oaks Ave & Arques Ave	AM PM	05/14/15	29.7 C	58.7 E	E+ F	97.5	F 1	26.3 0.751 81.8 0.431	60%	67%	9% 9%	6% 8%	18% 4%	101.1 97.5	F 72.	0.202	5% 40%	61%	25%	14% 13%
32 N Fair Oaks Ave & Evelyn Ave	AM	05/14/15	28.1 C	31.8	c	33.1	C-	8.1 0.228		1370	370	070	470	33.1	C- 1.8	0.027	4070	1570	1470	1370
33 N Fair Oaks Ave & Old San Francisco	PM AM	05/14/15	26.7 C	29.5 39.5	C D	31.7	C	8.8 0.171						31.7 40.2	C 3.6	0.034				
	PM	05/14/15	36.7 D+	49.4	D	52.2	D	17.9 0.234						52.2	D1.7	-0.017				
34 Fair Oaks Ave & El Camino Real	* AM	05/00/14	34.9 C-	42.2		47.0	D	18.6 0.294	1 00%	0.00/		40/	70/	47.0	D 7.8	0.066	1 50/	0.4.0/	001	400/
35 Sunnwale Ave & Evelvn Ave	+ AM	05/14/15	39.3 D 24.6 C	87.2 33.6 (F [C-	135.2 36.0	D+ 1	32.5 0.512 14.2 0.251	60%	86%	3%	4%	1%	36.0	D+ 2.6	0.033	5%	81%	6%	13%
	PM	05/14/15	27.9 C	36.0 E)+	37.7	D+	13.3 0.194						37.7	D+ 4.7	0.060				
36 Sunnyvale Ave & Washington Ave	+ AM PM	05/14/15 05/14/15	17.7 B 20.3 C+	14.1 23.8	B C	17.1 22.6	B C+	5.5 0.314 3.7 0.259						17.1 22.6	B 9.3 C+ -2.6	0.099				
Notes:																				
* Denotes CMP intersection (LOS E threshold)																				
+ Denotes an intersection on a CMP roadway (LOS E thr	eshold)	eighted) on	t relate to L S/		I has		ם פפם	roject Trips	and/or regions	l futuro tra	offic									

2. Existing volumes for the Fair Oaks/Maute intersection is extrapolated based on 2013 counts. BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact



				Existing	Current	ent GP 2035 Proposed GP compared to Existing Conditions Incr.						20	35 Propo	osed GP	compared to Cu	rrent GP C	ondition	s			
# Intersection	СМР	Peak Hour	Count Date	Avg. Delay (sec) LOS	Avg. Delay (sec) L	ב OS (Avg. Delay sec)	Incr. In Crit. Delay LOS (sec)	Incr. In Crit. V/C	Threshold for Sig. Contribution	P LUTE	ercent Co PPSP	ontributio	on ¹ Regiona	Avg. Delay I (sec) Li	Incr. In Cri Delay OS (sec	t. Incr. / In Crit.) V/C	Threshold for Considerable Contribution	Percent LUTE	t Contrib	ution ¹ LSAP
37 Sunnyvale Ave & McKinley Ave	+	AM PM	05/14/15	15.8 B	21.8 (49.4	C+ :	26.7 57 5	C 20.1 E+ 54.4	0.432						26.7 C	C 14.1	0.138				
38 Sunnyvale Ave & Iowa Ave	+	AM	05/14/15	12.8 B	12.1	B B-	13.7 23.9	B 4.2 C 12.1	0.339						13.7	B 2.3	0.034				
39 Sunnyvale Ave & El Camino Real	+	AM	05/14/15	23.3 C 30.0 C	28.6 40.2	C D	32.0 64 4	C- 10.1 E 53.3	0.228						32.0 0 64.4	C- 3.4 E 37.1	0.057				
40 Sunnyvale-Saratoga Rd & Remington Dr	*	AM	05/14/15	42.2 D 45.8 D	53.8 82.5	D- F 1	58.8 05.4	E+ 23.6 F 101.2	0.213	70%	87%	4%	4%	5%	58.8 E	+ 5.6 F 40.0	0.042	10%	82%	9%	9%
41 Sunnyvale-Saratoga Rd & Fremont Ave	*	AM	05/00/14	34.7 C- 45.7 D	40.3 59.4	D 4	43.6	D 11.9 E 24.8	0.191		0170			0.0	43.6	D 4.1	0.037	10,0	0270	0,0	0,0
42 Mathilda Ave & Almanor Ave	+	AM PM	06/04/15	17.1 B 27.1 C	23.9 42.7	C :	27.8 46.8	C 17.7 D 32.2	0.153						27.8 46.8	C 5.0	0.043				
43 Mathilda Ave & Maude Ave	*	AM PM	06/04/15 09/18/14	39.0 D+ 40.4 D	41.4 51.6	D /	44.5 55.4	D 7.8 E+ 23.0	0.066						44.5 55.4 E	D 3.4	0.000				
44 Mathilda Ave & Indio Way	+	AM PM	06/04/15 06/04/15	24.5 C 24.9 C	34.4 26.9	C	42.8 34.7	D 37.7 C- 11.9	0.188						42.8	D 32.4	0.107				
45 Mathilda Ave & California	+	AM PM	06/04/15 06/04/15	19.9 B- 25.3 C	29.4 41.2	C D	35.8 53.2	D+ 26.6 D- 43.3	0.299						35.8 E)+ 13.5)- 19.9	0.100				
46 Mathilda Ave & McKinley Ave	+	AM PM	06/04/15 06/04/15	15.1 B 16.4 B	19.8 29.3	B- : C :	21.3 23.4	C+ 8.8 C 11.3	0.241						21.3 C 23.4	C+ 1.4	-0.002				
47 Mathilda Ave & Iowa Ave	+	AM PM	06/04/15 06/04/15	13.1 B 16.7 B	14.0 31.5	B C	14.8 50.3	B 2.2 D 50.7	0.153 0.430						14.8 50.3	B 0.3	0.013				
48 Mathilda Ave & El Camino Real	*	AM PM	06/04/15 09/18/14	44.0 D 48.4 D	74.6 71.4	E T	76.0	E- 49.3 F 91.9	0.299	70%	84%	5%	3%	8%	76.0 I	E8.9	-0.022 0.164	20%	83%	12%	5%
49 Hollenbeck Ave & El Camino Real	+	AM PM	05/14/15	27.9 C 28.9 C	38.7 I 67.2	D+ 1	60.2 02.7	E 60.5	0.603	80%	78%	7%	3%	12%	60.2 102.7	E 41.5 F 53.1	0.217	40%	82%	14%	4%
50 Hollenbeck Ave & Fremont Ave		AM PM	05/00/14 05/00/14	34.6 C- 36.7 D+	39.0 42.7		41.9 44.6	D 12.4 D 10.0	0.289						41.9 44.6	D 5.0 D 1.8	0.071				
51 Mary Ave & Maude Ave		AM PM	05/14/15	25.8 C 29.1 C	30.2 59.9	С: E+Г	32.1 78.6	C- 7.6	0.356	80%	47%	38%	2%	13%	32.1 (C- 3.0	0.124	10%	27%	68%	5%
52 Mary Ave & Central Expwy	*	AM PM	05/22/15	50.0 D 61.6 E	90.2 149.3	F F 1	86.3 49.9	F 51.1 F 150.5	0.552	90% 30%	38%	41%	10% 6%	11% 15%	86.3 149.9	F 0.6 F -11.6	0.211	20%	42%	38%	20%
53 Mary Ave & Evelyn Ave		AM	05/14/15	30.0 C 30.3 C	38.6 I 34.7	D+ -	44.7	D 25.1 C- 6.3	0.394	00%	1070	0170	0,0		44.7	D 12.2	0.078	2070	1270	0070	2070
54 Mary Ave & El Camino Real	*	AM PM	05/14/15 09/19/14	37.3 D+ 37.8 D+	45.0 78.6	D E- 1	56.4 09.3	E+ 29.1 F 88.2	0.288 0.439	80%	77%	6%	3%	14%	56.4 E	+ 16.3 F 41.6	0.103 0.105	5%	85%	9%	6%
Notes: * Denotes CMP intersection (LOS E threshold)																					

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. The percent contributions are calculated for all approaches (unweighted) and relate to LSAP, Proposed LUTE, PPSP Project Trips and/or regional future traffic.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact



	Existing Current	nt GP 2035 Pro	posed GP compared to Existing (Conditions	2035 Proposed GP compared to Cu	rrent GP Conditions
		Incr.			Incr.	
	Avg. Avg.	Avg. In Crit.	Incr. Threshold	Avg.	In Crit. Incr. Threshold for	
Peak Coun	Delay Delay	Delay Delay I	n Crit. for Sig. <u>Percer</u>	nt Contribution Dela	Delay In Crit. Considerable	Percent Contribution
	(Sec) 105 (Sec) 1	203 (Sec) 203 (Sec)		SF LOAF Regional (Sec		LUIL FFOF LOAF
55 Mary Ave & Fremont Ave AM 05/00/1	4 41.8 D 93.7	F 129.8 F 134.9	0.626 40% 77% 7	% 5% 11% 129 .8	8 F 56.7 0.139 5%	72% 19% 9%
PM 05/00/1	4 42.0 D 119.0	F 151.5 F 173.9	0.747 40% 80% 4	% 3% 13% 151 .	5 F 48.5 0.112 5%	90% 5% 5%
56 Bernardo Ave & Evelyn Ave AM 05/12/1	5 24.3 C 25.3	C 28.4 C 6.9 (J.171	28.4	4 C 5.5 0.129	
PM 05/12/1	5 19.0 B- 24.3	C 23.6 C 2.5 C	J.162	23.6	5 C -6.4 -0.030	
57 Bernardo Ave & El Camino Real + AWI 05/14/1	5 40.1 D 41.2	D 44.7 D 8.5 (J.114	44.7	7 D 5.2 0.051	
Pivi 05/14/	2 33.0 D+ 43.3	C 30.1 C 15 (J.229 2.055	47.0	5 D 3.3 0.027	
PM 05/00/	4 20.0 C 20.4 1 22.6 C+ 26.6	C = 285 C = 10.4 C	1.000	28 5	5 C 26 0.028	
59 SR 85 NB & Fremont Ave AM 05/00/1	4 30.3 C 55.9	Et 60.6 E 43.4	0.245 0.306 90% 75% 8	% 5% 12% 60.6	6 F 8.2 0.026	
PM 05/00/1	4 26.6 C 31.4	C 32.5 C- 8.7 (0.266	32.5	5 C3.4 0.058	
60 SR 85 SB & Fremont Ave AM 05/00/1	4 37.5 D+ 75.8	E- 87.6 F 71.5	0.236 40% 59% 15	5% 4% 22% 87.6	6 F 15.7 0.040 20%	63% 31% 6%
PM 05/00/1	4 31.6 C 202.2	F 221.4 F 287.2	0.837 20% 70% 4	% 2% 24% 221. 4	4 F 51.3 0.115 5%	86% 10% 4%
61 Mathilda Ave & San Aleso Ave + AM 06/04/1	5 12.6 B 11.7	B+ 14.0 B 1.3 (0.029	14.0	D B 3.0 0.028	
PM 06/04/1	5 17.3 B 35.0	D+ 46.7 D 39.3 (0.443	46.7	7 D 14.8 0.033	
62 Ellis St & Fairchild Dr (MV) AM 09/15/1	5 14.7 B 15.6	B 15.7 B 3.1 (0.151	15.7	7 B 0.8 0.024	
PM 09/15/1	5 16.4 B 20.2	C+ <u>19.6</u> B- 11.5 (0.355	19.6	<u>6 B- 0.6 -0.013</u>	
63 Ellis St & Middlefield Rd (MV) AM 09/15/1	5 16.7 B 40.9	D 56.4 E+ 51.3	0.298 90% 21% 11	1% 7% 61% 56.4	4 E+ 18.5 0.061 90%	42% 38% 20%
PM 09/15/1	5 18.0 B 80.7	F 45.0 D 32.5 (J.518	45.0	D D -52.1 -0.154	
64 Ferguson Dr & Middlefield Rd (MV) AM 09/15/1	5 7.4 A 50.5	D 51.2 D- 56.8 (J.520	51.2	2 D- 0.8 0.002	
PIM 09/15/1	5 9.7 A 33.7	C- 35.7 D+ 29.2 (J.418	35.7	7 D+ 2.3 0.031	
05 Bernardo Avenue & Middlefield Rd (MV) AVI 09/15/1	5 9.7 A 11.0	B 216 C+ 78 (J.UGS 1 1 2 5	12.1	1 B 1.5 0.030	
66 Sylvan Ave & El Camino Real (MA) AM N/A	315 C 338	C_{-} 353 D+ 79 (108	21.0	3 D + 31 0.034	
PM N/A	28.2 C 34.6	C_{-} 383 D+ 107 (1 207	38.3	3 D + 20 0.016	
67 Grant Rd & El Camino Real (MV) * AM N/A	51.0 D- 81.9	F 74.8 E 55.5 (0.172	74.8	B E -13.2 -0.014	
PM 09/23/1	4 58.3 E+ 69.9	E 79.8 E- 32.2 (0.164	79.8	B E- 10.6 0.037	
68 SR 237 EB & Middlefield Rd (MV) AM 09/15/1	5 21.8 C+ 21.6	C+ 21.6 C+ 0.3 (0.102	21.6	6 C+ 0.1 0.036	
PM 09/15/1	5 16.6 B 16.8	B 17.4 B 13.2 (0.017	17.4	4 B -0.4 -0.046	
69 SR 237 WB & Middlefield Rd (MV) ² AM 09/15/1	5 20.2 C+ -					
PM 09/15/1	5 19.6 B					
70 SR 237 Service Road & Maude Ave AM 09/15/1	5 29.2 C 35.0	C- 34.9 C- 6.8 (0.115	34.9	9 C0.3 -0.005	
PM 09/15/1	5 34.7 C- 38.2	D+ 39.1 D 4.9 (0.251	39.1	1 D 2.5 0.079	
/1 Mathilda Ave & Olive Ave + AM 06/04/1	5 13.7 B 19.4	в- 22.3 С+ 11.7 (J.256	22.3	3 C+ 3.9 0.039	
PM 06/04/1	5 16.9 B 30.6	C 33.3 C- 20.3 (J.273	33.3	3 C- 4.2 U.U51	
12 Mathida Ave & Washington Avenue + AW 06/04/1	5 32.2 C- 43.4	D 52.1 D- 26.7 (J.∠3U J.233	52.1		
PM 06/04/	5 52.0 C- 47.1	D 53.0 D- 24.5 (J.200	53.0		

Notes:

Denotes CMP intersection (LOS E threshold)

Denotes an intersection on a CMP roadway (LOS E threshold)

MV indicates that the intersection is within the City of Mountain View.

1. The percent contributions are calculated for all approaches (unweighted) and relate to LSAP, Proposed LUTE, PPSP Project Trips and/or regional future traffic.

2. The SR 237 WB off-ramp at Middlefield Road is assumed moved to be aligned with Ferguson Road. Therefore, intersection #69 SR 237 WB ramp & Middlefield Rd would not exist under either Current GP or 2035 Proposed GP conditions. BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact



				Existing	Curre	nt GP		2(035 Pr	oposed	GP compare	d to Exist	ing Cond	litions		2	035	Propos	ed GP	compared to Cu	rrent GP C	onditio	ns
				Δια	Ava		Δια		Incr.	Incr	Threshold					Ava		Incr.	Incr	Throshold for			
		Peak	Count	Delay	Delay		Delay		Delay	In Crit.	for Sig.	Pe	rcent Co	ontributio	n ¹	Delay		Delay	In Crit.	Considerable	Percen	t Contri	bution ¹
# Intersection	CMP	Hour	Date	(sec) LOS	(sec)	LOS	(sec)	LOS	(sec)	V/C	Contribution	LUTE	PPSP	LSAP	Regiona	l (sec)	LOS	(sec)	V/C	Contribution	LUTE	PPSP	LSAP
73 Sunnyvale-Saratoga Road & Homestead Road	*	AM PM	05/05/15 09/18/14	34.9 C-	47.7 54 7	D D-	56.7 56.2	E+ F+	34.1 30.5	0.233						56.7 56.2	E+ F+	15.6 -1 1	0.053				
74 Hollenbeck Avenue & Homestead Road		AM PM	09/15/15 09/15/15	32.7 C- 35.5 D+	34.2 38.9	C- D+	33.9 46.3	C- D	2.2 24.5	0.088						33.9 46.3	C- D	0.1 17.9	0.028				
75 Mary Ave & Homestead Road		AM PM	09/15/15 09/15/15	25.5 C 24.8 C	26.1 29.0	C C	26.4 30.7	C C	4.7 11.2	0.156 0.248						26.4 30.7	C C	0.7 2.9	0.011 0.065				
76 Bernardo Avenue & Homestead Road		AM PM	09/15/15 09/15/15	15.5 B 13.7 B	17.7 13.6	B B	19.0 14.2	B- B	6.2 3.4	0.374 0.152						19.0 14.2	B- B	2.6 1.3	0.038 0.036				
77 SR 85 SB Ramp & Homestead Road		am Pm	09/15/15 09/15/15	15.4 B 18.0 B	32.9 25.1	с- с	37.5 28.2	D+ C	34.1 17.6	0.315 0.153						37.5 28.2	D+ C	8.1 5.5	0.031 0.039				
78 De Anza Blvd & I-280 NB Ramps (CUP) ²	*	am Pm	N/A 09/18/14	37.3 D+ 31.3 C	42.4 43.0	D D	45.3 49.7	D D	29.2 74.1	0.121 0.270						45.3 49.7	D D	12.1 12.9	0.038 0.028				
79 De Anza Blvd & I-280 SB Ramps (CUP) ²	*	am Pm	N/A 09/18/14	38.5 D+ 20.1 C+	40.0 23.6	D C	39.2 23.4	D C	5.4 13.0	0.036 0.124						39.2 23.4	D C	-7.6 3.9	-0.039 0.025				
80 Wolfe Rd & I-280 NB Ramps (CUP) ²	*	AM PM	N/A 11/09/14	12.4 B 11.8 B+	13.3 14.1	B B	13.9 14.1	B B	1.6 2.7	0.072 0.135						13.9 14.1	B B	0.8 -0.1	0.009 -0.003				
⁸¹ Wolfe Rd & I-280 SB Ramps (CUP) ²	*	AM PM	N/A 09/11/14	15.9 B 7.8 A	11.2 8.0	B+ A	11.1 8.6	B+ A	5.0 0.5	0.249						11.1 8.6	B+ A	-0.4 0.9	-0.021 0.012				
82 Lawrence Expwy & Cabrillo Ave (SCL)	+	AM PM	09/19/13 09/10/13	75.9 E- 60.2 E	143.5 120.4	F	161.8 128.4	F	124.4 95.3	0.411	1% 1%	17% 35%	10% 7%	28% 25%	45% 33%	161.8 128.4	F	26.8 7.6	0.067	10% 90%	21% 31%	28% 4%	51% 65%
⁸³ Lawrence Expwy Ramps & El Camino Real (SCL) ²	*	AM PM	N/A 09/17/14	30.7 C 29.7 C	33.6 33.5	C- C-	32.6 37.5	C- D+	4.4 12.0	0.160						32.6 37.5	C- D+	2.3 5.6	-0.025 0.052				
84 Lawrence Expwy & Benton St (SCL)	+	am Pm	09/19/13 09/10/13	81.0 F 55.5 E+	182.7 140.9	F F	200.5 168.4	F F	161.2 217.6	0.489 0.455	1% 1%	20% 23%	6% 4%	12% 12%	62% 61%	200.5 168.4	F	22.3 62.0	0.053 0.105	10% 5%	34% 43%	27% 3%	39% 54%
85 Lawrence Expwy & Homestead Road (SCL)	*	am Pm	09/19/13 09/10/13	84.5 F 80.3 F	118.6 147.8	F F	113.9 144.7	F	46.0 135.6	0.142	5% 1%	27% 33%	5% 2%	10% 6%	58% 59%	113.9 144.7	F	-8.1 0.6	0.012 0.038	70%	47%	22%	31%
86 Lawrence Expwy & Pruneridge Ave (SCL)	+	am Pm	09/19/13 09/17/13	67.3 E 36.6 D+	111.5 77.8	F E-	91.5 85.1	F	44.3 72.6	0.214 0.629	1% 60%	12% 22%	5% 2%	10% 5%	73% 71%	91.5 85.1	F	-30.2 13.1	-0.011 0.034	30%	45%	5%	50%
87 Lawrence Expwy SB & Stevens Creek Blvd (SCL)	*	AM PM	05/07/15 09/30/14	20.6 C+ 25.0 C	27.8 32.3	С С-	26.5 33.5	С С-	7.2 6.4	0.116 0.209						26.5 33.5	С С-	-1.4 1.0	-0.021 0.032				
88 Lawrence Expwy NB & Stevens Creek Blvd (SCL)	*	am Pm	05/07/15 09/30/14	32.3 C- 28.6 C	30.1 27.1	C C	30.3 26.9	C C	0.3 1.3	0.026 0.056						30.3 26.9	C C	0.3 9.9	0.014 -0.022				
89 I-280 SB Ramp & Stevens Creek Blvd (SCL)	*	am Pm	05/07/15 10/09/14	24.4 C 30.3 C	26.6 42.4	C D	26.6 38.5	C D+	14.9 28.0	0.215 0.151						26.6 38.5	C D+	0.2 -9.0	0.005 -0.031				
90 Lawrence Expwy & I-280 SB (SJ)	*	am Pm	09/19/13 09/17/13	63.4 E 35.6 D+	121.3 59.3	F E+	118.2 59.8	F E+	77.8 41.5	0.220	30% 80%	10% 18%	7% 3%	11% 6%	72% 73%	118.2 59.8	F E+	-1.0 0.6	0.012 0.010	70%	22%	41%	37%
Notes:																							
* Denotes CMP intersection (LOS E threshold)																							
+ Denotes an intersection on a CMP roadway (LOS E three	eshold)																						
SCL indicates that the intersection is within the City of Sa	nta Clar	a.																					
COP indicates that the intersection is within the City of Cu	ipertino.	inte-	actions	thin the Cit	offer				brook														
The percent contributions are calculated for all approx	JUSE. A		iabted) and	relate to L		use na		וו ע גע וו עספע	Projec	t Trine o	nd/or regional	future tro	ffic										
 Existing AM volumes for the Wolfe/I-280 ramps, De A BOLD indicates a substandard level of service 	nza/I-28	0 ram	ps, and the	Lawrence	Ramps/E	El Carr	nino Rea	al inter	rsectio	ons are e	extrapolated b	ased on 2	2011 cou	nts.									

BOLD and boxed indicates a significant cumulative impact



			Existin	Existing Current GP 2035 Proposed GP compared to Existing Conditions								:	2035	Propo	sed GP o	compared to Cu	rrent GF	Conditio	ons				
# Intersection	P CMP H	ak Count our Date	Avg. Delay (sec) L	.os	Avg. Delay (sec) I	LOS	Avg. Delay (sec)	LOS	Incr. In Crit Delay (sec)	Incr. In Crit. V/C	Threshold for Sig. Contribution	F LUTE	Percent (PPSP	Contributi LSAP	on ¹ Regional	Avg. Delay I (sec)	LOS	Incr. In Crit Delay (sec)	. Incr. In Crit. V/C	Threshold for Considerable Contribution	Perc LUTE	ent Conti PPSP	ribution ¹ LSAP
91 Oakmead Pkwy & Arques Ave	l	M 09/15/15 M 09/15/15	21.2 (23.9	C+ C	25.2 26.5	C C	24.1 32.7	С С-	4.2 17.3	0.333 0.426						24.1 32.7	С С-	-6.0 10.8	0.051 0.161				
92 Oakmead Pkwy & Central Expwy (SCL)	* 1	M 09/26/13 M 09/10/13	35.6 I 43.9	D+ D	59.4 81.3	E+ F	54.3 62.6	D- E	52.0 20.2	-0.096 0.217						54.3 62.6	D- E	-15.0 -51.7	-0.099 -0.138				
93 Corvin Dr & Kifer Road (SCL)	Ĩ	M 06/02/15 M 06/02/15	8.0 9.4	A A	13.2 10.4	B B+	15.1 16.1	B B	7.8 10.0	0.176 0.434						15.1 16.1	B B	3.2 14.0	-0.007 0.107				
94 Bowers Ave & Scott Blvd (SCL)	* /	M 08/19/14 M 09/17/14	29.9 30.8	C C	31.5 34.0	C C-	37.0 39.3	D+ D	11.2 13.2	0.274 0.334						37.0 39.3	D+ D	7.4 8.6	0.046 0.135				
95 Bowers Ave & Central Expwy (SCL)	* /	M 09/19/13 M 09/19/13	63.4 63.0	E ·	139.1 154.7	F F	102.5 147.3	F	66.5 98.3	0.385 0.251	70% 40%	42% 44%	11%	13% 13%	34% 36%	102.5 147.3	F F	-46.2 -68.8	-0.008 -0.088				
96 Bowers Ave & Kifer Road (SCL)	í	M 08/20/14 M 08/20/14	26.5 28.2	C C	31.6 84.4	C F	29.6 65.2	C E	7.7 59.2	0.210 0.453	90%	35%	5%	6%	54%	29.6 65.2	С Е	-0.5 -43.6	0.057 -0.103				
97 Calabazas Blvd & Monroe St (SCL)	í	M 10/02/13 M 10/02/13	8.6 5.6	A A	9.2 4.2	A A	9.6 4.4	A A	1.6 -1.4	0.285 0.243						9.6 4.4	A A	0.7 0.1	0.071 0.035				
98 Bowers Ave & Monroe St (SCL)	Ĩ	M 01/08/14 M 01/08/14	30.8 32.6	С С- ·	42.2 116.9	D F	51.1 128.9	D- F	24.9 101.2	0.431 0.477	50%	31%	3%	13%	53%	51.1 128.9	D- F	12.0 3.0	0.089 0.015				

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

1. The percent contributions are calculated for all approaches (unweighted) and relate to LSAP, Proposed LUTE, PPSP Project Trips and/or regional future traffic.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact

1. Introduction

As a major component of the proposed Sunnyvale General Plan (GP), the Land Use and Transportation Element (LUTE) establishes the fundamental framework of how the City will be laid out, and how various land uses, development and transportation facilities will function together. The LUTE consists of an aggregated set of goals and policies with the overall purpose of moving Sunnyvale towards a complete community that relies less on automobiles and more on alternative modes of transportation. The LUTE is developed to help guide the City's land use and transportation decisions to the horizon year of 2035.

Within the City of Sunnyvale, the Lawrence Caltrain Station area and the Peery Park area are both managed by individual plans: the Lawrence Station Area Plan (LSAP) and the Peery Park Specific Plan (PPSP). Land use changes for these two areas are analyzed in separate TIAs, and are not included as part of the LUTE analysis.

Table 1 summarizes the existing, current General Plan (GP) and 2035 proposed GP land use data within Sunnyvale and within the LUTE study area provided by City staff. Existing land use data provided by City staff was for year 2013.

The City of Sunnyvale sphere of influence is shown on Figure 1. The LUTE study area is shown on Figure 2.

		Sunnyvale			LUTE Study Area	<u>a</u>
	2013 Existing	Current GP	2035 Proposed GP	2013 Existing	Current GP	2035 Proposed GP
Housing Units	57,000	66,750	72,100	54,751	63,901	67,186
Population	147,055	150,725	174,500	141,985	144,171	163,215
I/O/C Square Feet (million s.f.)	47.3	55.5	59.8	34.3	40.8	42.6
Jobs	82,000	109,600	124,410	59,845	83,910	93,522

Table 1

Sunnyvale and LUTE Land Use Scenarios



Figure 2 LUTE Study Intersections



City of Sunnyvale Land Use and Transportation Element Update TIA



LEGEND

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----- = City of Sunnyvale Limits

= Study Intersection

Figure 2 LUTE Study Intersections



Scope of Study

This study was conducted for the purpose of identifying the potential long-term traffic impacts of the proposed LUTE. The potential impacts of the LUTE were evaluated in accordance with the standards set forth by the City of Sunnyvale and the Santa Clara County Valley Transportation Authority (VTA) Congestion Management Program (CMP). The LUTE is estimated to generate more than 100 peak hour trips. The traffic analysis is based on the AM and PM peak hour levels of service for 98 signalized intersections. Eight of the study intersections are within the City of Mountain View, four are within the City of Cupertino, 15 are within the City of Santa Clara, and one is within the City of San Jose. 27 of the study intersections are CMP intersections. The study intersections are selected to include locations where the proposed LUTE is expected to generate 10 or more peak-hour trips per lane.

The Santa Clara County VTA CMP guidelines require that the CMP freeway segments be evaluated to determine the impact of added traffic for projects that generate trips equal to or greater than one percent of the freeway segment's capacity. The proposed LUTE is expected to generate added traffic volume on 94 freeway segments (29 on US 101, 18 on I-280, 11 on SR 237, 12 on I-880, 19 on SR 85, and 5 on SR 87) within Santa Clara County, on 4 freeway segments (2 on US 101, and 2 on I-280) within San Mateo County, and on 8 segments on I-880 within Alameda County. Therefore, a freeway analysis is conducted on these freeway segments in accordance with the respective congestion management agency guidelines. The traffic analysis also includes a capacity analysis for 32 freeway ramps.

Study Intersections

- 1. Mathilda Avenue & Java Drive (CMP),
- 2. Mathilda Avenue & 5th Avenue,
- 3. Mathilda Avenue & Innovation Way,
- 4. Mathilda Avenue & SR 237 Westbound Ramps,
- 5. Mathilda Avenue & SR 237 Eastbound Ramps,
- 6. Crossman Avenue & Caribbean Drive,
- 7. Crossman Avenue & Java Drive,
- 8. Fair Oaks Avenue & Tasman Drive,
- 9. Fair Oaks Avenue & Weddell Drive,
- 10. Fair Oaks Avenue & US 101 Northbound Ramps,
- 11. Lawrence Expressway & Tasman Drive (CMP),
- 12. Lawrence Expressway & Lakehaven Drive,
- 13. Lawrence Expressway & US 101 Northbound Ramps,
- 14. Lawrence Expressway & US 101 Southbound Ramps,
- 15. Lawrence Expressway & Oakmead Parkway,
- 16. Lawrence Expressway & Arques Avenue (CMP),
- 17. Lawrence Expressway & Kifer Road,
- 18. Lawrence Expressway & Reed Avenue (CMP),
- 19. Duane Avenue/Stewart Drive & Duane Avenue,
- 20. Fair Oaks Avenue & Duane Avenue,
- 21. Fair Oaks Avenue & Maude Avenue,
- 22. Wolfe Road & Stewart Drive,
- 23. Wolfe Road & Arques Avenue,
- 24. Wolfe Road & Kifer Road,
- 25. Wolfe Road & Evelyn Avenue,
- 26. Wolfe Road & Reed Avenue,
- 27. Evelyn Avenue & Reed Avenue,
- 28. Wolfe Road & El Camino Real (CMP),
- 29. Wolfe Road & Fremont Avenue,
- 30. Wolfe Road & Homestead Road,
- 31. Fair Oaks Avenue & Arques Avenue
- 32. Fair Oaks Avenue & Evelyn Avenue,
- 33. Fair Oaks Avenue & Old San Francisco Road,
- 34. Fair Oaks Avenue & El Camino Real (CMP),
- 35. Sunnyvale Avenue & Evelyn Avenue,
- 36. Sunnyvale Avenue & Washington Avenue,
- 37. Sunnyvale Avenue & McKinley Avenue,
- 38. Sunnyvale Avenue & Iowa Avenue,



- 39. Sunnyvale Avenue & El Camino Real,
- 40. Sunnyvale-Saratoga Road & Remington Drive (CMP),
- 41. Sunnyvale-Saratoga Road & Fremont Avenue (CMP),
- 42. Mathilda Avenue & Almanor Avenue,
- 43. Mathilda Avenue & Maude Avenue (CMP),
- 44. Mathilda Avenue & Indio Avenue,
- 45. Mathilda Avenue & California Avenue,
- 46. Mathilda Avenue & McKinley Avenue,
- 47. Mathilda Avenue & Iowa Avenue,
- 48. Mathilda Avenue & El Camino Real (CMP),
- 49. Hollenbeck Avenue & El Camino Real,
- 50. Hollenbeck Avenue & Fremont Avenue,
- 51. Mary Avenue & Maude Avenue,
- 52. Mary Avenue & Central Expressway (CMP),
- 53. Mary Avenue & Evelyn Avenue,
- 54. Mary Avenue & El Camino Real (CMP),
- 55. Mary Avenue & Fremont Avenue,
- 56. Bernardo Avenue & Evelyn Avenue,
- 57. Bernardo Avenue & El Camino Real,
- 58. Bernardo Avenue & Fremont Avenue,
- 59. SR 85 Northbound Ramps & Fremont Avenue,
- 60. SR 85 Southbound Ramps & Fremont Avenue,
- 61. Mathilda Avenue & San Aleso Avenue,
- 62. Ellis Street & Fairchild Avenue [Mountain View],
- 63. Ellis Street & Middlefield Road [Mountain View],
- 64. Ferguson Avenue & Middlefield Road [Mountain View],
- 65. Bernardo Avenue & Middlefield Road [Mountain View],
- 66. Sylvan Avenue & El Camino Real [Mountain View],
- 67. Grant Avenue/SR 237 & El Camino Real [Mountain View] (CMP),
- 68. SR 237 Eastbound Ramp & Middlefield Road [Mountain View],
- 69. SR 237 Westbound Ramp & Middlefield Road [Mountain View],
- 70. SR 237 Ramps & Maude Avenue,
- 71. Mathilda Avenue & Olive Avenue,
- 72. Mathilda Avenue & Washington Avenue,
- 73. Sunnyvale-Saratoga Road & Homestead Road [Cupertino] (CMP),
- 74. Hollenbeck Avenue & Homestead Road,
- 75. Mary Avenue & Homestead Road,
- 76. Mary Avenue & Homestead Road,
- 77. SR 85 Southbound Ramp & Homestead Road,
- 78. De Anza Boulevard & I-280 Northbound Ramps [Cupertino] (CMP),
- 79. De Anza Boulevard & I-280 Southbound Ramps [Cupertino] (CMP),
- 80. Wolfe Road & I-280 Northbound Ramps [Cupertino] (CMP),
- 81. Wolfe Road & I-280 Southbound Ramps [Cupertino] (CMP),
- 82. Lawrence Expressway & Cabrillo Avenue [Santa Clara] (CMP),
- 83. Lawrence Expressway Ramps & El Camino Real [Santa Clara] (CMP),
- 84. Lawrence Expressway & Benton Street [Santa Clara] (CMP),
- 85. Lawrence Expressway & Homestead Road [Santa Clara] (CMP),
- 86. Lawrence Expressway & Pruneridge Avenue [Santa Clara] (CMP),
- 87. Lawrence Expressway Southbound & Stevens Creek Boulevard [Santa Clara] (CMP),
- 88. Lawrence Expressway Northbound & Stevens Creek Boulevard [Santa Clara] (CMP),
- 89. I-280 Southbound Ramp & Stevens Creek Boulevard [Santa Clara] (CMP),
- 90. Lawrence Expressway & I-280 Southbound Ramp [San Jose] (CMP),
- 91. Oakmead Parkway & Argues Avenue,
- 92. Oakmead Parkway & Central Expressway [Santa Clara] (CMP),
- 93. Corvin Drive & Kifer Road [Santa Clara],
- 94. Bowers Avenue & Scott Boulevard [Santa Clara] (CMP),
- 95. Bowers Avenue & Central Expressway [Santa Clara] (CMP),
- 96. Bowers Avenue & Kifer Road [Santa Clara],
- 97. Calabazas Boulevard & Monroe Street [Santa Clara], and
- 98. Bowers Avenue & Monroe Street [Santa Clara].



Freeway Segments

Santa Clara County

- US 101 between SR 85 (S) and Embarcadero Road
- SR 237 between I-880 and SR 85
- I-280 between US 101 and Alpine Road
- I-880 between I-280 and Dixon Landing Road
- SR 85 between US 101 (S) and US 101 (N)
- SR 87 between I-280 and US 101

San Mateo County

- US 101 between Embarcadero Road and SR 92
- I-280 between Alpine Road and SR 92

Alameda County

• I-880 between Dixon Landing Road and SR 92

Study Freeway Ramps

All ramps at the following interchanges were studied:

- SR 237 at Lawrence Expressway
- SR 237 at Mathilda Avenue
- SR 237 at Maude Avenue
- SR 237 at Middlefield Road
- US 101 at Lawrence Expressway
- US 101 at Fair Oaks Avenue
- US 101 at Mathilda Avenue

Traffic conditions at the study intersections and freeway segments were analyzed for the weekday AM and PM peak hours of commute traffic. In the study area, the AM peak hour is typically between 7:00 AM and 9:00 AM, while the PM peak hour is typically between 4:00 PM and 6:00 PM.

Traffic conditions were evaluated for the following scenarios:

- **Scenario 1:** *Existing Conditions.* Existing traffic volumes are based on recent traffic counts conducted between the years of 2014 and 2015, the 2014 CMP TRAFFIX database, as well as County records for the expressways.
- **Scenario 2**: *Current GP Conditions.* The current general plan (GP) conditions are included as part of the LUTE analysis. The current GP traffic volumes were estimated using the Sunnyvale Travel Demand Forecasting Model (STFM) for year 2035.
- **Scenario 3:** 2035 *Proposed GP Conditions.* The proposed 2035 GP comprises the Lawrence Station Area Plan (LSAP), the Peery Park Specific Plan (PPSP), and the Land Use and Transportation Element (LUTE) of the proposed GP. The 2035 proposed GP traffic volumes were estimated using the STFM for year 2035. The 2035 proposed GP conditions are evaluated relative to existing conditions to determine the potential significant impacts of the proposed GP as well as the significant contributions from the LUTE to the significant impacts of the proposed GP. The 2035 proposed GP conditions are also compared to the current GP conditions for information only as this comparison is not required by CEQA.

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 previous traffic studies, the City of Sunnyvale, the VTA CMP TRAFFIX database, county records for expressways, and field observations. The following data were collected from these sources:

- existing traffic volumes,
- existing lane configurations, and
- signal timing and phasing.

Level of Service Standards and Analysis Methodologies

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 Study Intersections

All City of Sunnyvale, City of Mountain View, City of Santa Clara, City of Cupertino, and City of San Jose level of service methodologies for signalized intersections are the 2000 *Highway Capacity Manual* (HCM) method. This method is applied using the TRAFFIX software. The 2000 HCM operations method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. Since TRAFFIX is also the CMP-designated intersection level of service methodology, the methodologies employ the CMP default values for the analysis parameters.

The City of Sunnyvale, Mountain View, Santa Clara, Cupertino, and San Jose level of service standards for signalized intersections are all LOS D or better, except on roadways considered "regionally significant" within Sunnyvale and on CMP facilities within Santa Clara, which have a standard of LOS E. In the study area, the signalized intersections within Sunnyvale along Lawrence Expressway, El Camino Real, and Sunnyvale-Saratoga Road with its extensions into Mathilda Avenue and Sunnyvale Avenue are considered regionally significant. The signalized intersections within Santa Clara along Lawrence Expressway are CMP facilities.

The correlation between average control delay and level of service is shown in Table 2.

CMP Intersections

The designated level of service methodology for the CMP also is the 2000 HCM operations method for signalized intersections, using TRAFFIX. The CMP level of service standard for signalized intersections within Sunnyvale, Mountain View, Cupertino, and Santa Clara is LOS E or better. Within the City of San Jose, the level of service standard for signalized CMP intersections is LOS D or better.

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Signal progression is extremely favorable. Most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay.	10.0 or less
B+ B B-	Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay.	10.1 to 12.0 12.1 to 18.0 18.1 to 20.0
C+ C C-	Higher delays may result from fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though may still pass through the intersection without stopping.	20.1 to 23.0 23.1 to 32.0 32.1 to 35.0
D+ D D-	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lenghts, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 39.0 39.1 to 51.0 51.1 to 55.0
E+ E E-	This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently.	55.1 to 60.0 60.1 to 75.0 75.1 to 80.0
F	This level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes of such delay levels.	greater than 80.0
Source: Tra V1	ansportation Research Board, <i>2000 Highway Capacity Manual</i> (Washington, D.C TA Traffic Level of Service Analysis Guidelines (June 2003), Table 2.	., 2000) p10-16.

Table 2

Signalized Intersection Level of Service Definition

Freeway Segments

Within Santa Clara County, freeway segments are analyzed as prescribed in the Santa Clara County CMP technical guideline. 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 vehicle 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 3. 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.

Freeway segments within the County of San Mateo are evaluated by using the volume-to-capacity (V/C) ratio method according to the City/County Association of Government (C/CAG) CMP guidelines. 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. The County of San Mateo freeway segment V/C ratio is correlated to level of service as shown in Table 3.

Freeway segments within Alameda County are evaluated by using V/C ratios according to the Alameda County Transportation Commission (Alameda CTC) guidelines. The CMP specifies that a capacity of 2,000 vehicles per hour per lane (vphpl) be used for all freeway segments. The Alameda County freeway segment V/C ratio is correlated to level of service as shown in Table 3.

Table 3

Freeway Segment Level of Service Definition

		Santa Clara County ¹	San Mateo County ²	Alameda County ³
Level of Service	Description	Density (vehicles/mile/lane)	Maximum V/C Ratio	Maximum V/C Ratio
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.	11.0 or less	0.28	0.35
В	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.	11.0 to 18.0	0.46	0.58
С	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.	18.0 to 26.0	0.67	0.75
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.	26.0 to 46.0	0.85	0.90
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.	46.0 to 58.0	1	1
F	Vehicular flow breakdowns occurs. Large queues form behind breakdown points.	greater than 58.0	N/A	N/A
<u>Source:</u> 1. San	ta Clara County Valley Transportation Authority, Transportation Impact Analysis Gu	idelines, Updated Octob	er 2014.	

2. City/County Association of Governments of San Mateo County, Final San Mateo County Congestion Management Program 2013, Table B-1 (65 mph free-flow speed).

3. Alameda Cunty Congestion Management Agency, 2014 Level of Service Monitoring Study, Table 2-3.

Freeway Ramps

A freeway ramp analysis was performed in order to verify that the freeway ramps would have sufficient capacity to serve the expected traffic volumes with and without the project. This analysis consisted of a volume-to-capacity ratio evaluation of the freeway ramps at the study interchanges. The ramp capacities were obtained from the *Highway Capacity Manual 2000*, and considered the free-flow speed, number of lanes on the ramp, and ramp metering.

Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. For this analysis, the criteria used to determine significant impacts on signalized intersections are based on the City of Sunnyvale, City of Mountain View, City of Cupertino, City of Santa Clara, City of San Jose, and VTA's CMP level of service standards.

The effects of the project on other transportation facilities, such as pedestrian and bicycle facilities as well as transit service, were determined on the basis of VTA's CMP standards.

Definition of Significant Intersection Impacts

The project is said to create a significant adverse impact on traffic conditions at a signalized intersection in Sunnyvale, Mountain View, Cupertino, Santa Clara, and San Jose if for either peak hour:

- 1. The level of service at the intersection drops below its respective level of service standard when project traffic is added, <u>or</u>
- 2. An intersection that operates below its level of service standard under no project conditions experiences an increase in critical-movement delay of four (4) or more seconds, *and* the volume-to-capacity ratio (V/C) is increased by 0.01 or more when project traffic is added.

The exception to this threshold is when the addition of project traffic reduces the amount of average control delay for critical movements, i.e., the change in average control delay for critical movements are negative. In this case, the threshold is when the project increases the critical V/C value by 0.01 or more.

The operation of principal arterials and state highways located within urbanized Santa Clara County is measured by the level of service at CMP Intersections. CMP intersections are generally high-volume intersections located along these thoroughfares. The definition of a significant impact at a CMP intersection is the same as for the City of Sunnyvale, except that the standard for acceptable level of service for all CMP and regional intersections is LOS E or better.

A significant impact by all Sunnyvale, Mountain View, Cupertino, Santa Clara, San Jose, and CMP standards is said to be satisfactorily mitigated when measures are implemented that would restore intersection conditions to its LOS standard *or* to an average delay that eliminates the project impact.

Definition of Significant Freeway Impacts

Santa Clara County

For this analysis, the criteria used to determine impacts on freeway segments are based on CMP standards. Per CMP requirements, freeway impacts are measured relative to existing conditions (i.e. there is no evaluation of freeways under background conditions). The project is said to create a significant adverse impact on traffic conditions on a freeway segment if for either peak hour:

- 1. The level of service of the freeway segment is LOS F under existing conditions, and
- 2. The number of new trips added by the project is more than one percent of the freeway capacity.

San Mateo County

Within San Mateo County, the project is said to create a significant adverse impact on traffic conditions on a freeway segment if for either peak hour:

- 1. The cumulative analysis indicates that the combination of the proposed project and future cumulative traffic demand will result in the freeway segment operating at a level of service that violates the standard adopted in the current CMP <u>and</u> the proposed project increases traffic demand on the freeway segment by an amount equal to one percent or more of the segment capacity, <u>or</u>
- 2. The project will add traffic demand equal to one percent or more of the segment capacity if the freeway segment is currently not in compliance with the adopted LOS standard.



Alameda County

Within Alameda County, the project is said to create a significant adverse impact on traffic conditions on a freeway segment if for either peak hour:

- 1. The addition of project traffic causes a freeway segment to operate at LOS F, or
- 2. The project will add traffic demand equal to three percent or more of the segment capacity if the freeway segment is operating at LOS F without the project.

Definition of Significant Freeway Ramp Impacts

A freeway ramp analysis was performed in order to verify that the freeway ramps would have sufficient capacity to serve the expected traffic volumes with and without the project. For the purpose of this study, the project is said to create a significant adverse impact on a freeway ramp if its implementation:

- 1. Causes the volume-to-capacity (V/C) ratio of the freeway ramp to exceed 1.0; or
- 2. Increases the amount of traffic on a freeway ramp that is already exceeding its capacity by more than one percent (1%) of the ramp's capacity.

Definition of Significant Transit Facilities Impacts

The VTA CMP's *Transportation Impact Analysis Guidelines* requires an evaluation of transit vehicle delay, transit access and transit facilities. However, there are no established impact criteria by either VTA or the City of Sunnyvale. For the purpose of this study, the project is said to create a potentially significant transit impact if:

- 1. A study intersection along a transit service route is found to have a significant motor vehicle LOS intersection impact, or
- 2. The project is expected to generate increased transit demand that may not be accommodated by the existing transit services; or
- 3. The project is expected to reduce transit availability or access to transit facilities.

Definition of Significant Pedestrian Or Bicycle Facilities Impacts

The VTA CMP's *Transportation Impact Analysis Guidelines* requires evaluation of pedestrian and bicycle facilities. However, there are no established impact criteria by either VTA or the City of Sunnyvale. For the purpose of this study, the project is said to create a potentially significant pedestrian or bicycle impact if:

- The project proposes modifications to the existing pedestrian or bicycle facilities that are not in conformance with adopted plans (i.e. Sunnyvale's Bicycle Master Plan, General Plan, Countywide Bicycle Plan); or
- 2. The project reduces, severs, or eliminates existing or planned pedestrian or bicycle facilities; or
- 3. The project creates demand for pedestrian or bicycle facilities that do not currently exist.

Report Organization

This report has a total of five chapters. Chapter 2 describes existing conditions including the existing roadway network, transit service, bicycle and pedestrian facilities. Chapter 3 presents the traffic conditions in the LUTE study area under the current general plan conditions. Chapter 4 presents the traffic conditions in the LUTE study area under the 2035 proposed general plan conditions, the project impact on the transportation system, and any recommended mitigation measures.

2. Existing Conditions

This chapter describes the existing conditions for all of the major transportation facilities within the LUTE study area, including the roadway network, transit service, and bicycle and pedestrian facilities.

Existing Roadway Network

As discussed in the City of Sunnyvale *Land Use and Transportation Element Update, Transportation – Existing Conditions Draft Report*, published on June 10, 2010, there are approximately 300 miles of roads within Sunnyvale's boundaries. Freeways and expressways comprise approximately 13 miles, arterials provide approximately 35 miles, and collectors provide approximately 58 miles. The remaining 194 miles, the majority of the street facilities, consist of local streets. Presented below are the summary functions of the roadway classifications as discussed in the Existing Conditions report.

- **Freeways:** Freeways are intended to provide for high levels of safety and efficiency in the movement of large volumes of traffic, for long distance/regional trips at high speeds (usually 65 miles per hour for the general traffic). Freeways have full access control, meaning that they have no atgrade crossings with roads or driveways.
- **Expressways:** Within the different cities in the region, expressways provide a high degree of mobility. They provide relatively high operating speeds (usually 35 to 45 miles per hour) with some degree of access control to enhance the mobility function.
- Arterials: Arterials are moderate to high-capacity roads that serve large volumes of traffic between areas in urban centers. They are noted for limited property access directly onto the road (except in older or denser communities), and they are designed to carry traffic between neighborhoods. Grade separated interchanges are typically established where arterials intersect with freeways or expressways. At grade intersections are typical for intersections with collector and local streets. Commercial areas such as shopping centers, gas stations and other businesses are often developed on arterials.
- **Collectors:** Collectors serve a dual function in accommodating the shorter trip and feeding the arterials. Thus, they provide some degree of mobility and also serve abutting properties. Some small-scale commercial areas and key community functions such as schools, churches and recreational facilities can often be found on residential collector roads.
- Local Streets: Local streets have relatively short trip lengths and because property access is their main function, there is little need for mobility or high operating speeds (usually 25 miles per hour).

Regional access to Sunnyvale is provided by SR 237, US 101, SR 85, and I-280. These facilities are described below.

SR 237 is a four to six-lane freeway within Sunnyvale that extends west to El Camino Real (Route 82) and east to I-880 in Milpitas. East of Mathilda Avenue, SR 237 has two mixed-flow lanes and one HOV lane in each direction. West of Mathilda Avenue, SR 237 has two mixed-flow lanes in each direction. SR 237 provides access to Sunnyvale via interchanges at Middlefield Road, Maude Avenue, Mathilda Avenue, Fair Oaks Avenue, and Lawrence Expressway.



US 101 is an eight-lane freeway (three mixed-flow lanes and one HOV lane in each direction) in Sunnyvale. US 101 extends northward through San Francisco and southward through Gilroy. US 101 provides access to Sunnyvale via interchanges at Mathilda Avenue, Fair Oaks Avenue, and Lawrence Expressway.

I-280 is an eight-lane freeway (three mixed-flow lanes and one HOV lane in each direction) within the vicinity of Sunnyvale. I-280 provides regional freeway access between the cities of San Francisco and San Jose. Sunnyvale access to/from I-280 is provided via interchanges with De Anza Boulevard, Wolfe Road, Stevens Creek Boulevard, and Lawrence Expressway.

SR 85 is a north-south freeway that begins at the US 101 east of Shoreline Boulevard, and extends south towards San Jose and terminates at the US 101 south of the Silicon Valley Boulevard/Bernal Road interchange. Within the vicinity of Sunnyvale, SR 85 is six lanes wide (two mixed-flow lanes and one HOV lane in each direction). Sunnyvale access to/from SR 85 is provided via interchanges with El Camino Real, Fremont Avenue, and Homestead Road.

Major roadways within Sunnyvale include Lawrence Expressway, Fair Oaks Avenue, Wolfe Road, Mathilda Avenue, Sunnyvale-Saratoga Road, Mary Avenue, Caribbean Avenue, Java Drive, Tasman Drive, Duane Avenue, Maude Avenue, Arques Avenue, Central Expressway, Kifer Road, Evelyn Avenue, Reed Avenue/Monroe Street, El Camino Real, Remington Drive, Fremont Avenue, and Homestead Road. These roads are described below.

Lawrence Expressway is an eight-lane expressway with a raised median running north-south. It begins at Saratoga Avenue in the south, crosses through Sunnyvale, extends northward and transitions into Caribbean Drive. Lawrence Expressway connects with US 101 and SR 237 via full-access freeway interchanges.

Fair Oaks Avenue is a four-lane to six-lane, north-south arterial. Fair Oaks Avenue begins at Java Drive north of SR 237 and extends southward, transitioning into Remington Drive at its junction with El Camino Real. Fair Oaks Avenue has a full-access freeway interchange with US 101 and a partial-access interchange with SR 237. North of US 101, Fair Oaks Avenue has a raised center median. North of Tasman Drive, light rail runs within the center median of Fair Oaks Avenue.

Wolfe Road is a four-lane to six-lane, north-south arterial that begins north at N. Fair Oaks Avenue, and extends south into the City of Cupertino, ending at Stevens Creek Boulevard (its transition point into Miller Avenue). Wolfe Road has a raised center median. Wolfe Road has a full-access interchange with I-280 in Cupertino.

Mathilda Avenue is a six-lane to eight-lane arterial running north-south. Mathilda Avenue begins at Caribbean Drive in the north, extends southward, and transitions into Sunnyvale-Saratoga Road. Freeway interchanges are located at US 101 and SR 237.

Sunnyvale-Saratoga Road is a six-lane divided major arterial south of Mathilda Avenue with a posted speed limit of 40 mph. North of Mathilda Avenue, Sunnyvale Avenue continues as a two- to four-lane undivided minor arterial with a shared two-way center left-turn lane and a posted speed limit of 30 to 35 mph.

Mary Avenue is a four-lane to six-lane roadway extending north-south from Almanor Avenue in the north to Homestead Road in the south and has a posted speed limit of 35 mph. Mary Avenue is classified as an arterial south of Central Expressway, and a collector north of Central Expressway. Mary Avenue has an at-grade intersection with Central Expressway.

Caribbean Avenue is a six-lane divided arterial that runs east-west along the northern edge of the Moffett Park area. Caribbean Avenue begins west at its transition from Mathilda Avenue, and extends east towards its transition to Lawrence Expressway at the SR 237 interchange.

Java Drive is a four-lane divided arterial that runs east-west within the Moffett Park area. Java Drive begins west at its transition from Lockheed Martin Way at the intersection with Mathilda Avenue, and extends east towards its transition to Fair Oaks Avenue at the SR 237 interchange. The VTA light rail runs within the center median along the entirety of Java Drive.

Tasman Drive is a two-lane to four-lane divided collector that runs east-west from Morse Avenue to its transition towards Great Mall Parkway at the I-880 interchange in Milpitas. The VTA light rail runs within the center median along the entirety of Tasman Drive east of the Fair Oaks/Tasman intersection.



Duane Avenue is a two-lane to four-lane collector that begins west of Mathilda Avenue and extends east towards Lawrence Expressway at which point it transitions into Oakmead Parkway continuing eastward.

Maude Avenue is a two-lane to four-lane collector that runs east-west and begins at Wolfe Road in the east and ends at Logue Avenue. Maude Avenue is part of a split diamond freeway interchange with SR 237.

Arques Avenue is a two-lane to four-lane arterial that begins west at its terminal west of Stowell Avenue, extends east past San Tomas Expressway and transitions into Scott Boulevard. Arques Avenue connects with Central Expressway via a westbound on-ramp and an eastbound off-ramp.

Central Expressway is a four-lane to six-lane expressway running east-west. In Sunnyvale, Central Expressway has two eastbound lanes and two westbound lanes. It begins in the east at Trimble Road in San Jose, crosses Sunnyvale, extends westward and transitions into Alma Street in Palo Alto. Within Sunnyvale, Central Expressway connects to Lawrence Expressway, Wolfe Road, Arques Avenue, and Mathilda Avenue via interchanges, and has an at-grade intersection with Mary Avenue. Central Expressway has right-in-right-out access points throughout its stretch in Sunnyvale.

Kifer Road is a four-lane collector that begins west at Fair Oaks Avenue and extends east towards Bowers Avenue. Kifer Road has a center two-way left-turn median along the entirety of the roadway.

Evelyn Avenue is a two-lane to four-lane arterial that begins west at Castro Street in the City of Mountain View and extends east to its terminal at Reed Avenue in the City of Sunnyvale. Within the study area, Evelyn Avenue has a center two-way left-turn median that extends along the entirety of the roadway. Evelyn Avenue is grade-separated at its intersection with Mathilda Avenue, and provides no access to northbound Mathilda Avenue from eastbound Evelyn Avenue.

Reed Avenue/Monroe Street is a two-lane to four-lane collector that begins west at Fair Oaks Avenue as Reed Avenue, and extends southeast towards its terminal at Tisch Way in the City of San Jose. Reed Avenue is within the City of Sunnyvale, and transitions to Monroe Street in the City of Santa Clara at its intersection with Lawrence Expressway (Sunnyvale-Santa Clara city boundary). Reed Avenue/Monroe Street has a center two-way left-turn lane that runs along the entirety of the roadway.

El Camino Real (SR 82) is a six-lane divided arterial in Sunnyvale. It has a posted speed limit of 40 mph in the project study area. El Camino Real extends from Mission Street in Colma to The Alameda in Santa Clara. El Camino Real provides access to SR 85 via an interchange.

Remington Drive is a two-lane to four-lane roadway in Sunnyvale. It begins in the east at the terminus of Fair Oaks Avenue at the El Camino Real intersection, and extends west to its terminus west of Bernardo Avenue. Between Sunnyvale-Saratoga Road and El Camino Real, Remington Drive is classified as an arterial and has two-lanes in each direction. West of Sunnyvale-Saratoga Road, Remington Drive is classified as a collector and has one-lane in each direction. A center two-way left-turn median runs along the entirety of Remington Drive.

Fremont Avenue is a two-lane to six-lane divided arterial that begins west at Foothill Expressway in Los Altos and extends east towards its terminus at El Camino Real. Fremont Avenue is six-lane wide between Hollenbeck Avenue and Bernardo Avenue, and is four-lane wide elsewhere in Sunnyvale. Fremont Avenue provides access to SR 85 via an interchange.

Homestead Road is a two-lane to four-lane arterial that begins east at Lafayette Street in Santa Clara, and extends west towards its terminus at Foothill Expressway. Homestead Road is four lanes wide with a center left-turn median along the entirety of its stretch within Sunnyvale.

Existing Bicycle and Pedestrian Facilities

Bike lanes provide a striped lane for one-way bike travel on a street or highway and are designed for the exclusive use of cyclists with certain exceptions. For instance, right turning vehicles must merge into the lane before turning, and pedestrians can use the bike lane when there is no adjacent sidewalk. A bicycle route may be identified on a local residential or collector street where the travel lane is wide enough and the traffic volume is low enough to allow both cyclists and motor vehicles.

According to the *City of Sunnyvale 2006 Bicycle Plan*, the City has a total of 79 miles of bike lanes, mostly on arterial roadways. Since the publication of the bicycle plan, there has been little change to the bike lane provisions. New bike lanes are provided along Mathilda Avenue and Maude Avenue fronting the development at the northwest quadrant of the Mathilda/Maude intersection, as well as on El Camino Real between Fair Oaks Avenue and Sunnyvale Avenue. According to the bicycle plan, City designated bike routes are on Mathilda Avenue north of Moffett Park Drive, on Lawrence Expressway, on Mary Avenue between Fremont Avenue and Maude Avenue, on Wolfe Road between Reed Avenue and El Camino Real, on Maude Avenue between Mathilda Avenue and Fair Oaks Avenue, and on Central Expressway.

The City of Sunnyvale provides an extensive network of pedestrian facilities, including sidewalks, crosswalks, and pedestrian signals at signalized intersections, to promote the ease and safety of walking within the City. Most of the residential neighborhoods in the City include sidewalks. Gaps in sidewalks are identified in sections of industrial areas in the Peery Park area, Moffett Park area, and Lawrence Station area.

The existing bicycle facilities within Sunnyvale are shown on Figure 3.



Bike Route (Class III)

Figure 3 Existing Bicycle Facilities


Existing Transit Service

Existing transit services in Sunnyvale are provided by Caltrain and the VTA. VTA bus routes are described in Table 4 and shown on Figure 4. As shown on Figure 4, two bus routes (route 22 and route 32) provide services to various neighboring cities. These two routes run mainly east-west through Sunnyvale near the downtown area on El Camino Real and on Evelyn Avenue. Most of the remaining bus routes provide service generally in a north-south direction, connecting the neighborhoods south of El Camino Real with the employment areas in the northern part of Sunnyvale. Four bus routes (route 32, 53, 54, and 55) provide service to the Sunnyvale Transit Center.

VTA also provides light rail service in Sunnyvale. Light rail route 902 provides service between Downtown Mountain View and the Winchester station in Campbell with 15-minute headways during peak commute hours. Within the City of Sunnyvale, light rail provides service to the Moffett Park area north of US 101 along Tasman Drive, Fair Oaks Avenue, Java Drive, and Mathilda Avenue. The Lockheed Martin Light Rail Station also provides connections to two local bus routes, three express routes, and two limited-stop routes.

In general, the downtown area and the Moffett Park area north of SR 237 are well-served by transit. The neighborhoods south of El Camino Real are adequately served by transit, with bus stops generally within ½ mile of residents. Areas poorly served by transit include the light industrial area near the Lawrence Caltrain Station, and the Peery Park area northwest of the Sunnyvale Caltrain Station.

Caltrain Service

Commuter rail service between San Francisco and Gilroy is provided by Caltrain. There are two Caltrain stations within Sunnyvale: the Lawrence Caltrain Station and the Sunnyvale Caltrain Station.

The Lawrence Caltrain Station, located beneath the Lawrence Expressway overcrossing between Reed Avenue and Kifer Road, provides Caltrain service with approximately 20- to 30-minute headways during the weekday AM and PM commute hours and 60 minute headways midday, at nights and on weekends. The Lawrence Caltrain Station provides service for only the Local and Limited trains. The baby-bullet train does not stop at Lawrence Station.

The Sunnyvale Caltrain Station, located near the intersection of Frances Street and Evelyn Avenue, provides Caltrain service with approximately 20- to 30-minute headways during the weekday AM and PM commute hours and 60 minute headways midday, at nights and on weekends. The Sunnyvale Caltrain Station provides service for all local, limited-stop, and baby bullet trains. Bus routes 32 and 54 both stop at the Sunnyvale Transit Station.

The Mary Moffett Caltrain Shuttle is a free public shuttle program funded by Google with financial support from the Bay Area Air Quality Management District and the Peninsula Corridor Joint Powers Board. This shuttle provides service between the Mountain View Caltrain Station and the Mary-Moffett area office buildings during commute hours. Shuttles depart from the Caltrain Station in the morning and travel northbound to the Mary-Moffett business area between 7 AM and 10 AM. During the afternoon commute period, the shuttles provide southbound service to take passengers to the Caltrain Station between 2:50 PM and 6:00 PM.

Table 4 Existing Transit Services

Bus Route	Route Description	Within Sunnyvale	Headway ¹
Local Route 22	Palo Alto Transit Center to Eastridge Transit Center	El Camino Real	10-15 min
Local Route 26	Lockheed Martin Transit Center to Eastridge Transit Center	Mathilda Ave, 5th Ave, Java Dr, Fair Oaks Ave, Old San Francisco Ave, Wolfe Rd	30 min
Local Route 32	San Antonio Shopping Center to Santa Clara Transit Center	Central Expwy, Mathilda Ave, Evelyn Ave, Wolfe Rd, Reed Ave	30 min
Local Route 53	West Valley College to Sunnyvale Transit Center	Mathilda Ave, Evelyn Ave, Washington Ave, Frances St, Bernardo Ave, Remington Dr, Mary Ave, Homestead Rd	60 min
Local Route 54	De Anza College to Sunnyvale Transit Center	5th Ave, Mathilda Ave, Evelyn Ave, Frances St, Washington Ave, Olive Ave, Pastoria Ave/Hollenbeck Ave	30 min
Local Route 55	De Anza College to Great America	Sunnyvale-Saratoga Rd, Remington Dr, Fair Oaks Ave, Old San Francisco Ave, Sunnyvale Ave, Frances St, Maude Ave, Daune Ave, Lawrence Expwy, Tasman Dr	20-30 min
Express Route 120	Fremont BART to Lockheed Martin Transit Center	5th Ave, Mathilda Ave, Java Dr, Crossman Ave, Caribbean Dr, SR 237	15 min ²
Express Route 121	Gilroy Transit Center to Lockheed Martin Transit Center	5th Ave, Mathilda Ave, Java Dr, Crossman Ave	20-30 min ³
Express Route 122	South San Jose to Lockheed Martin Transit Center	5th Ave, Mathilda Ave, Java Dr, Crossman Ave, Craibbean Dr, Lawrence Expwy	4
Limited Route 304	South San Jose to Sunnyvale Transit Center	Evelyn Avenue, Fair Oaks Ave, Arques Ave	50-80 min ⁵
Limited Route 321	Great Mall Transit Center to Lockheed Martin Transit Center	5th Ave, Mathilda Ave, Java Dr, Crossman Ave, Caribbean Dr, Lawrence Expwy, Tasman Dr	6
Limited Route 328	Almaden Expwy to Lockheed Martin Transit Center	5th Ave, Mathilda Ave, Java Dr, Crossman Ave, Caribbean Dr, Lawrence Expwy	70-95 min ⁷

Notes:

1. Approximate headways during peak commute periods.

2. Express route 120 provides 5 bus services in the southbound direction between 7 AM and 8:30 AM, and 5 bus services in the northbound direction between 4 PM and 6 PM.

3. In Sunnyvale, express route 121 provides 6 bus services in the northbound direction between 7 AM and 9 AM, and 6 bus services in the southbound direction between 4 PM and 6 PM.

4. Express route 122 provides 1 bus service in the southbound direction leaving the Lockheed Martin Transit Center at 4:48 PM, and provides no bus services during the AM peak period.

5. In Sunnyvale, limited route 304 provides 4 bus services in the northbound direction between 7 AM and 8:30 AM, and 4 bus services between 3:30 PM and 3:50 PM.

6. Limited route 321 provides 1 bus service in the westbound direction arriving at the Lockheed Martin Transit Center at 8:46 AM, and provides no bus services during the PM peak period.

7. Limited route 328 provides 2 bus services in the northbound direction arriving at the Lockheed Martin Transit Center at 7:10 AM and 8:44 AM, and 2 bus services in the southbound direction departing at 4:50 PM and 6:00 PM from the Lockheet Martin Transit Center.



Figure 4 Existing Transit Services



Three public Caltrain shuttles serve the Lawrence Caltrain Station:

- Duane Avenue: This shuttle provides service between the Mountain View Caltrain Station and the Lawrence Caltrain Station during weekday commute hours. This shuttle leaves from either Caltrain Station in the morning and provides service to businesses on Stewart Drive/Duane Avenue, and Argues Avenue. Shuttle schedules are coordinated with Caltrain schedules.
- Bowers-Walsh: This shuttle provides service between the Lawrence Caltrain Station and the Bowers/Walsh area office buildings during weekday commute periods. Shuttles are coordinated with Caltrain schedules with 6 shuttles in the morning leaving the station between 6:45 AM and 9:30 AM, and 6 shuttles in the evening arriving at the station between 3:45 PM and 7:00 PM.
- Mission: This shuttle provides service between the Lawrence Caltrain Station and Mission Area office buildings during weekday commute periods. Shuttles are coordinated with Caltrain schedules with 6 shuttles in the morning leaving the station between 6:15 AM and 9:30 AM, and 5 shuttles in the evening arriving at the station between 3:30 PM and 6:30 PM.

ACE Service

The Altamont Commuter Express (ACE) Gray Shuttle (Route 822) serves Sunnyvale. ACE provides commuter rail service between Stockton, Tracy, Pleasanton, and San Jose during commute hours. This free shuttle, funded by the Bay Area Air Quality Management District, transports Sunnyvale passengers to and from the ACE Great America Station in Santa Clara. The Gray Shuttle runs on Arques Avenue, Wolfe Road, and Kifer Road, with four eastbound trips in the morning and four westbound trips in the afternoon/evening with headways averaging 60 minutes.

Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were obtained by observations. The existing intersection lane configurations are shown on Figure 5.

Existing Traffic Volumes

Existing traffic volumes are based on recent traffic counts conducted between the years of 2014 and 2015, the 2014 CMP TRAFFIX database, as well as County records for the expressways. The latest counts available at the intersections at De Anza Boulevard and I-280 ramp intersections, Wolfe Road and I-280 ramp intersections, and at Lawrence Expressway Ramps and El Camino Real intersection were dated 2011. This set of counts was extrapolated to the year 2015 based on growth at nearby intersections.

The existing AM and PM peak-hour intersection volumes are shown on Figure 6. The traffic count data are included in Appendix A.

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Middlefield Rd 1462(393) ← 50(158)	$ \underset{\text{Rd}}{\text{Middlefield}} \overbrace{\downarrow} \overbrace{\downarrow} \overbrace{\downarrow} \overbrace{\downarrow} \overbrace{\downarrow} \overbrace{\downarrow} \overbrace{\downarrow} $	$\begin{bmatrix} \text{EI} \\ \text{Camino} \\ \text{Real} \end{bmatrix} \xrightarrow{6} \qquad \bigcup \qquad \bigcup \qquad \bigcup \qquad \bigcup \qquad 1721(890) \\ \longleftarrow \qquad 128(49) \end{bmatrix}$	$\begin{array}{c} \text{EI} \\ \text{Camino} \\ \text{Real} \end{array} \xrightarrow{\hspace{1cm}} \begin{array}{c} \begin{array}{c} \\ \\ \end{array} \xrightarrow{\hspace{1cm}} \end{array} \xrightarrow{\hspace{1cm}} \begin{array}{c} \\ \\ \end{array} \xrightarrow{\hspace{1cm}} \end{array} \xrightarrow{\hspace{1cm}} \begin{array}{c} 1247(969) \\ \\ \\ \end{array} \xrightarrow{\hspace{1cm}} 363(355) \end{array}$
$335(1201) \longrightarrow 14(88) \xrightarrow[6]{6} 92 \xrightarrow$	$\begin{array}{c}3(15) \xrightarrow{} \\254(1019) \xrightarrow{} \\148(55) \xrightarrow{} \\\end{array} \begin{array}{c}1 \\ \\ \end{array} \begin{array}{c}1 \\ \\ \\ \\ \\ \end{array} \begin{array}{c}\\$	$\begin{array}{c} 157(190) \xrightarrow{\bullet} \\ 819(1832) \xrightarrow{\bullet} \\ 362(276) \xrightarrow{\bullet} \\ \end{array} \begin{array}{c} 0 \\ \hline \\ \hline \\ \end{array} \begin{array}{c} 0 \\ \hline \\$	$\begin{array}{c} 814(501) \xrightarrow{\bullet} \\ 970(1427) \xrightarrow{\bullet} \\ 32(80) \xrightarrow{\bullet} \\ \end{array} \begin{array}{c} & \uparrow \\ & \downarrow \\$
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345(995) → 70(203) → ∰ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕ ⊕	235(378) 238(923) 238(923) 304(158) 190(158) 190(158) 100(158)	$286(214) \rightarrow 288(214) $	$256(32) \xrightarrow{Mathilda} (56)(57) \xrightarrow{Mathilda} (56)(57)(57)(57)(57)(57)(57)(57)(57)(57)(57$
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$ \begin{array}{c} 44(86) \\ 24(40) \\ \hline g \\ g \\ \end{array} $	$\begin{array}{c c} Rd & \bullet & \bullet & \bullet \\ \hline 247(195) & -\bullet & \bullet \\ 304(712) & -\bullet & \bullet \\ 314(181) & \bullet & \bullet \\ \hline \\ \end{array} \begin{array}{c} \bullet & \bullet \\ \bullet \\$	$ \begin{array}{c} \mathbb{R} d & \bullet & \bullet & \bullet \\ \hline 121(66) & -\bullet & \bullet \\ 459(640) & \bullet & \bullet \\ 167(453) & \stackrel{\scriptstyle }{\searrow} \bullet & \bullet \\ \hline 167(453) & \stackrel{\scriptstyle }{\boxtimes} \bullet & \bullet \\ \end{array} $	$ \begin{array}{c} Rd \\ \hline 115(68) \\ 481(809) \\ 89(12) \\ \hline \end{array} \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $
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507(828) → 120(76) →	$\begin{array}{c} 655(809) \longrightarrow 1 \\ 7(15) & \begin{array}{c} & & \\ &$	^{De anza} 81 435(641)	$\begin{array}{c} \begin{array}{c} & & \\ $
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I-280 NB ↓ ↓ 351(574) On-Ramp ↓ ↓ ↓ ↓	I-280 SB Off-Ramp 540(146) ↑ ↑ ↓ I-280 SB	$\begin{array}{c} \text{Poinciana} \\ \text{Dr} \\ \hline 172(90) \\ \hline 172(20) \\ $	Camino Real 271/(220)
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	LEGEND XX(XX) = AM(PM) Peak-Ho	ur Traffic Volumes	
51 125(104) 147(13) 147(13) 147(13) 147(13) 147(13) 147(13) 147(13) 147(13) 147(13) 147(13) 193(58) 193(5		E	Figure 6 xisting Traffic Volumes







Figure 6 Existing Traffic Volumes



Existing Intersection Levels of Service

Intersection levels of service were evaluated against the respective jurisdiction standards. The results of the intersection level of service analysis under existing conditions are summarized in Table 5, and graphically shown on Figure 7. The results of the analysis show that most of the study intersections currently operate at acceptable levels during both the AM and PM peak hours, with the following exceptions:

- Lawrence Expressway & Arques Avenue (#16) PM Peak Hour (LOS F)
- Lawrence Expressway & Kifer Road (#17) AM & PM Peak Hour (LOS F)
- Lawrence Expressway & Reed Avenue (#18) AM & PM Peak Hour (LOS F)
- Lawrence Expressway & Benton Street (#84) AM Peak Hour (LOS F)
- Lawrence Expressway & Homestead Road (#85) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & I-280 Southbound Ramp (#90) AM Peak Hour (LOS E)

The intersection levels of service calculation sheets are included in Appendix B.

The intersections on Mathilda Avenue at the SR 237 ramps are closely-spaced intersections with multiple turning movements that operate as a single coordinated signal system. These intersections experience operational issues beyond what is reflected in the typical HCM level of service calculations. To supplement the HCM analysis, a micro-simulation analysis was conducted using Synchro/Sim Traffic software to provide a more accurate assessment of the Mathilda Avenue corridor operational issues. The simulation shows that the intersections along Mathilda Avenue are currently operating at an acceptable LOS E, which matches the field observations that Hexagon conducted during the AM and PM peak hours at these intersections.

City of Sunnyvale Land Use and Transportation Element Update TIA





Table 5

Existing Intersection Levels of Service Summary

#	Intersection	СМР	Peak Hour	Count Date	Exist Avg. Delay (sec)	ing LOS
<i>"</i>		*		01/00/15	(300)	200
1	Mathilda Ave & Java Dr		PM	10/01/14	26.6 28.0	С С
2	Mathilda Ave & 5th Ave	+	AM	06/04/15	13.5	В
2			PM	06/04/15	22.1	C+
3	Mathilda Ave & Innovation Way	+	PM	06/04/15	18.5	в- В-
4	Mathilda Ave & SR 237 WB ¹	+	AM	06/04/15	-	E
			PM	06/04/15	-	Е
5	Mathilda Ave & SR 237 EB ¹	+	AM	06/04/15	-	Е
			PM	06/04/15	-	E
6	Crossman Ave & Caribbean Dr	+	AM	05/14/15	10.3	B+
7	Crossman Ave & Jove Dr			11/00/17	30.0	D+ B
'	Clossifian Ave & Java Di		PM	11/00/14	29.4	C C
8	Fair Oaks Ave & Tasman Dr		AM	06/04/15	17.1	В
-			PM	06/04/15	19.4	B-
9	Fair Oaks Ave & Weddell Dr		AM	06/04/15	19.0	B-
			PM	06/04/15	13.8	В
10	N Fair Oaks Ave & US 101 NB		AM	10/00/14	16.5	В
			PM	10/00/14	21.0	C+
11	Lawrence Expwy & Tasman Dr	*	AM	05/18/15	40.2	D F
12		-		05/18/15	04.8 50.6	
12	Lawrence Expwy & Lakenaven Di	•	PM	05/18/15	63.5	F
13	Lawrence Expwy & US 101 NB	+	AM	05/22/15	21.7	C+
			PM	05/22/15	24.4	С
14	Lawrence Expwy & US 101 SB	+	AM	05/18/15	15.1	В
			PM	05/18/15	43.1	D
15	Lawrence Expwy & Oakmead Pkwy	+	AM	05/18/15	48.7	D
40	2	*	PM	05/18/15	57.5	E+
10	Lawrence Expwy & Arques Ave ²			05/18/15	00.0 95.5	F
17	Louropeo Evous & Kitor Dd ²	+	AM	05/18/15	168.2	F
	Lawience Expwy & Niler Ru	•	PM	05/18/15	81.0	F
18	Lawrence Expwy & Reed Ave/Monroe St ²	*	AM	05/18/15	203.1	F
			PM	05/18/15	86.5	F

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. At the intersections at the Mathilda/SR 237 interchange, the calculated LOS does not reflect the unmet vehicle demand that cannot get through the intersections during the peak hours. The LOS reflect the micro-simulation analysis results using Synchro/Sim Traffic software.

2. The intersections of Lawrence/Arques, Lawrence/Kifer, and Lawrence/Reed-Monroe all assume grade separations for all future scenarios.



Existing Intersection Levels of Service Summary

			Peak	Count	Exist Avg. Delay	ing_
#	Intersection	CMP	Hour	Date	(sec)	LOS
19	Duane/Stewart & Duane Ave		AM PM	10/00/14 10/00/14	31.4 30.6	с с
20	N Fair Oaks Ave & Duane Ave		AM	10/00/14	26.3 32.1	C C
21	Fair Oaks Ave & Maude Ave ¹		AM	N/A	28.6	C C
22	Wolfe Rd & Stewart Dr		AM	10/00/14	16.1	B
23	Wolfe Rd & Arques Ave		AM	10/00/14	24.8	C
24	Wolfe Rd & Kifer Rd		AM	05/00/14	20.4	C+
25	Wolfe Rd & Evelyn Ave		AM	05/00/14	26.0	000
26	Wolfe Rd & Reed Ave		AM	05/00/14	24.6	C
27	Evelyn Ave & Reed Ave		AM	05/00/14	28.8	B+
28	Wolfe Rd & El Camino Real	*	AM	05/14/15	49.8	D
29	Wolfe Rd & Fremont Ave		AM	09/19/14 05/00/14	48.9	E+ D
30	Wolfe Rd & Homestead Rd		AM	05/00/14	49.8 30.9	C
31	Fair Oaks Ave & Arques Ave		РМ AM	05/00/14	31.9 29.7	C
32	N Fair Oaks Ave & Evelyn Ave		PM AM	05/14/15	34.4 28.1	C- C
33	N Fair Oaks Ave & Old San Francisco		PM AM	05/14/15	26.7 35.4	C D+
34	Fair Oaks Ave & El Camino Real	*	PM AM	05/14/15 05/00/14	36.7 34.9	D+ C-
35	Sunnyvale Ave & Evelyn Ave	+	РМ АМ	10/15/14 05/14/15	39.3 24.6	D C
36	Sunnyvale Ave & Washington Ave	+	PM AM PM	05/14/15 05/14/15	27.9 17.7	C B C+
			FIVI	03/14/15	20.3	C1

<u>Notes</u>:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. Existing volumes for the Fair Oaks/Maude intersection is extrapolated based on 2013 counts.



Existing Intersection Levels of Service Summary

		0115	Peak	Count	Exist Avg. Delay	ing
#	Intersection	СМР	Hour	Date	(sec)	LOS
37	Sunnyvale Ave & McKinley Ave	+	AM	05/14/15	15.8	В
38	Supporte Ave & Jowe Ave	+		05/14/15	12.8	B
50	Summyvale Ave & lowa Ave	•	PM	05/14/15	16.0	В
39	Sunnwale Ave & El Camino Real	+	AM	05/14/15	23.3	C
			PM	05/14/15	30.0	С
40	Sunnyvale-Saratoga Rd & Remington Dr	*	AM	05/14/15	42.2	D
			PM	09/19/14	45.8	D
41	Sunnyvale-Saratoga Rd & Fremont Ave	*	AM	05/00/14	34.7	C-
			PM	10/01/14	45.7	D
42	Mathilda Ave & Almanor Ave	+	AM	06/04/15	17.1	В
			PM	06/04/15	27.1	С
43	Mathilda Ave & Maude Ave	*	AM	06/04/15	39.0	D+
			PM	09/18/14	40.4	D
44	Mathilda Ave & Indio Way	+	AM	06/04/15	24.5	С
4-			PM	06/04/15	24.9	C
45	Mathilda Ave & California	+	AM	06/04/15	19.9	B-
40			PM	06/04/15	25.3	C
40	Mathilda Ave & McKinley Ave	+		06/04/15	15.1	В
47	Mathilda Ava 9 Janua Ava	-		06/04/15	10.4	D
47	Mathida Ave & Iowa Ave	т		06/04/15	16.7	B
18	Mathilda Avo & El Camino Pool	*		06/04/15	10.7	П
-0			PM	00/04/10	48.4	D
49	Hollenbeck Ave & El Camino Real	+	AM	05/14/15	27.9	C
			PM	05/14/15	28.9	C
50	Hollenbeck Ave & Fremont Ave		AM	05/00/14	34.6	C-
			PM	05/00/14	36.7	D+
51	Mary Ave & Maude Ave		AM	05/14/15	25.8	С
	,		PM	05/14/15	29.1	С
52	Mary Ave & Central Expwy	*	AM	05/22/15	50.0	D
			PM	05/22/15	61.6	Е
53	Mary Ave & Evelyn Ave		AM	05/14/15	30.0	С
			PM	05/14/15	30.3	С
54	Mary Ave & El Camino Real	*	AM	05/14/15	37.3	D+
			PM	09/19/14	37.8	D+
Note	<u>:S:</u>					

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

Existing Intersection Levels of Service Summary

			Peak	Count	Exist Avg. Delay	ing
#	Intersection	CMP	Hour	Date	(sec)	LOS
55	Mary Ave & Fremont Ave		AM PM	05/00/14 05/00/14	41.8 42.0	D D
56	Bernardo Ave & Evelyn Ave		AM PM	05/12/15	24.3 19.0	C B-
57	Bernardo Ave & El Camino Real	+	AM PM	05/14/15	40.1 35.6	D D+
58	Bernardo Ave & Fremont Ave		AM PM	05/00/14 05/00/14	26.6 22.6	C C+
59	SR 85 NB & Fremont Ave		AM PM	05/00/14 05/00/14	30.3 26.6	C C
60	SR 85 SB & Fremont Ave		AM PM	05/00/14 05/00/14	37.5 31.6	D+ C
61	Mathilda Ave & San Aleso Ave	+	AM PM	06/04/15 06/04/15	12.6 17.3	B B
62	Ellis St & Fairchild Dr (MV)		AM PM	09/15/15	14.7 16.4	B B
63	Ellis St & Middlefield Rd (MV)		AM PM	09/15/15	16.7 18.0	B
64	Ferguson Dr & Middlefield Rd (MV)		AM	09/15/15	7.4	A A
65	Bernardo Avenue & Middlefield Rd (MV)		AM	09/15/15	9.7 15 /	A B
66	Sylvan Ave & El Camino Real (MV)		AM	N/A	31.5	C C
67	Grant Rd & El Camino Real (MV)	*	AM PM	N/A 09/23/14	51.0 58.3	D- F+
68	SR 237 EB & Middlefield Rd (MV)		AM	09/15/15	21.8	C+
69	SR 237 WB & Middlefield Rd (MV)		AM	09/15/15	20.2	C+ B-
70	SR 237 Service Road & Maude Ave		AM	09/15/15	29.2	C
71	Mathilda Ave & Olive Ave	+	AM	06/04/15	13.7	B
72	Mathilda Ave & Washington Avenue	+	AM PM	06/04/15 06/04/15 06/04/15	32.2 32.0	Б С- С-

<u>Notes</u>:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

MV indicates that the intersection is within the City of Mountain View.

Existing Intersection Levels of Service Summary

					Exist	ing
#	Intersection	СМР	Peak Hour	Count Date	Avg. Delay (sec)	LOS
73	Sunnyvale-Saratoga Road & Homestead Road	*	AM PM	05/05/15	34.9	C-
74	(COP) Hollenbeck Avenue & Homestead Road		AM	09/15/15	32.7 35.5	C-
75	Mary Ave & Homestead Road		AM	09/15/15	25.5	C C
76	Bernardo Avenue & Homestead Road		AM	09/15/15	24.0 15.5	B
77	SR 85 SB Ramp & Homestead Road		AM	09/15/15	15.4	B
78	De Anza Blvd & I-280 NB Ramps (CUP) 1	*	AM	N/A	37.3	D+
79	De Anza Blvd & I-280 SB Ramps (CUP) ¹	*	AM	N/A	38.5 20.1	D+ C+
80	Wolfe Rd & I-280 NB Ramps (CUP) ¹	*	AM	N/A	12.4	B B+
81	Wolfe Rd & I-280 SB Ramps (CUP) ¹	*	AM	N/A	15.9 7.8	B A
82	Lawrence Expwy & Cabrillo Ave (SCL)	+	AM	09/19/13	75.9	E- F
83	Lawrence Expwy Ramps & El Camino Real	*	AM	N/A	30.7	0
84	(SCL) Lawrence Expwy & Benton St (SCL)	+	PM AM	09/17/14	29.7 81.0	F
85	Lawrence Expwy & Homestead Road (SCL)	*	PM AM	09/10/13 09/19/13	55.5 84.5	E+ F
86	Lawrence Expwy & Pruneridge Ave (SCL)	+	PM AM	09/10/13	80.3 67.3	E
87	Lawrence Expwy SB & Stevens Creek Blvd (SCL)	*	AM	09/17/13	36.6 20.6	D+ C+
88	Lawrence Expwy NB & Stevens Creek Blvd (SCL)	*	AM	09/30/14	32.3	C-
89	I-280 SB Ramp & Stevens Creek Blvd (SCL)	*	AM	09/30/14	28.6	C
90	Lawrence Expwy & I-280 SB (SJ)	*	PM AM DM	10/09/14 09/19/13	30.3 63.4	E
			FIVI	09/17/13	55.0	D+

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

CUP indicates that the intersection is within the City of Cupertino.

SJ indicates that the intersection is within the City of San Jose. All intersections within the City of San Jose has an LOS D threshold.

1. Existing AM volumes for the Wolfe/I-280 ramps, De Anza/I-280 ramps, and the Lawrence Ramps/El Camino Real intersections are extrapolated based on 2011 counts. **BOLD** indicates a substandard level of service



Existing Intersection Levels of Service Summary

#	Intersection	СМР	Peak Hour	Count Date	Exist Avg. Delay (sec)	ing LOS
91	Oakmead Pkwy & Arques Ave		AM PM	09/15/15 09/15/15	21.2 23.9	C+ C
92	Oakmead Pkwy & Central Expwy (SCL)	*	AM PM	09/26/13 09/10/13	35.6 43.9	D+ D
93	Corvin Dr & Kifer Road (SCL)		AM PM	06/02/15 06/02/15	8.0 9.4	A A
94	Bowers Ave & Scott Blvd (SCL)	*	AM PM	08/19/14 09/17/14	29.9 30.8	C C
95	Bowers Ave & Central Expwy (SCL)	*	AM PM	09/19/13 09/19/13	63.4 63.0	E E
96	Bowers Ave & Kifer Road (SCL)		AM PM	08/20/14 08/20/14	26.5 28.2	C C
97	Calabazas Blvd & Monroe St (SCL)		AM PM	10/02/13 10/02/13	8.6 5.6	A A
98	Bowers Ave & Monroe St (SCL)		AM PM	01/08/14 01/08/14	30.8 32.6	C C-

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

Existing Freeway Levels of Service

Existing weekday AM and PM peak hour traffic volumes on the study freeway segments were obtained from the 2014 CMP Annual Monitoring Report for segments within Santa Clara County, the Level of Service and Performance Measure Monitoring Report for segments within San Mateo County, and the 2014 LOS Monitoring Report for segments within Alameda County. The existing freeway levels of service during the weekday AM and PM peak hours of traffic are summarized on Figures 8 to 11. The mixed-flow lanes on the following directional study freeway segments currently operate at LOS F during either the AM or PM peak hour:

Santa Clara County

- US 101, northbound from Silver Creek Valley Road to Mathilda Avenue, and from Moffett Boulevard to SR 85 AM Peak Hour
- US 101, northbound from SR 85 to Embarcadero Road AM & PM Peak Hours
- US 101, southbound from Embarcadero Road to Rengstorff Avenue, from Shoreline Boulevard to SR 237, and from Fair Oaks Avenue to Oakland Road PM Peak Hour
- SR 237, westbound from I-880 to Zanker Road AM Peak Hour
- SR 237, westbound from Fair Oaks Avenue to Mathilda Avenue, and from Maude Avenue to SR 85 PM Peak Hour
- SR 237, eastbound from US 101 to Zanker Road, and from McCarthy Road to I-880 PM Peak Hour
- SR 85, northbound from Cottle Road to Winchester Boulevard, and from De Anza Boulevard to El Camino Real – AM Peak Hour
- SR 85, southbound from US 101 to Fremont Avenue, from Stevens Creek Boulevard to Saratoga Avenue, and from SR 17 to Union Avenue – PM Peak Hour
- SR 87, northbound from I-280 to US 101 AM Peak Hour
- I-280, northbound from I-280 to SR 17, and from Winchester Boulevard to Foothill Expressway AM Peak Hour
- I-280, northbound from SR 17 to Winchester Boulevard AM & PM Peak Hours
- I-280, southbound from Page Mill Road to Magdalena Avenue, and from SR 85 to 10th Street PM Peak Hour
- I-880, northbound from I-280 to Stevens Creek Boulevard AM Peak Hour
- I-880, northbound from Stevens Creek Boulevard to Bascom Avenue, and from The Alameda to First Street – AM & PM Peak Hours
- I-880, northbound from Bascom Avenue to The Alameda, and from SR 237 to Dixon Landing Road PM Peak Hour
- I-880, southbound from Brokaw Road to Coleman Avenue AM & PM Peak Hours

• I-880, southbound from Coleman Avenue to Stevens Creek Boulevard – PM Peak Hour

San Mateo County

- US 101, between Embarcadero Road and SR 92 AM & PM Peak Hours
- I-280, between Alpine Road and SR 84 AM & PM Peak Hours

Alameda County

- I-880, northbound from Dixon Landing Road to Mission Boulevard, and from Alvarado-Niles Road to Tennyson Road – PM Peak Hour
- I-880, southbound from SR 92 to Stevenson Boulevard AM Peak Hour



The HOV lanes on the following directional study freeway segments currently operate at LOS F during either the AM or PM peak hour:

Santa Clara County

- US 101, northbound from Silver Creek Valley Road to Hellyer Avenue, from Tully Road to Trimble Road, and from Great America Parkway to Lawrence Expressway AM Peak Hour
- US 101, southbound from Embarcadero Road to Oregon Expressway, from Fair Oaks Avenue to San Tomas Expressway, and from SR 87 to Oakland Road PM Peak Hour
- SR 237, westbound from I-880 to McCarthy Road AM Peak Hour
- SR 85, northbound from Blossom Hill Road to Camden Avenue, from Union Avenue to Winchester Boulevard, and from De Anza Boulevard to El Camino Real AM Peak Hour
- SR 85, southbound from SR 237 to El Camino Real, and from I-280 to Stevens Creek Boulevard PM Peak Hour
- SR 87, northbound from Julian Street to Coleman Avenue AM Peak Hour
- I-280, northbound from Leigh Avenue to Winchester Boulevard, and from Saratoga Road to Lawrence Expressway – AM Peak Hour
- I-280, southbound from Winchester Boulevard to Leigh Avenue PM Peak hour
- I-880, northbound from SR 237 to Dixon Landing Road PM Peak Hour
- I-880, southbound from Dixon Landing Road to SR 237 AM Peak Hour
- I-880, southbound from Brokaw Road to US 101 AM & PM Peak Hours
- I-880, southbound from Montague Expressway to Brokaw Road PM Peak Hour

San Mateo County

US 101, between Embarcadero Road and Whipple Avenue – AM & PM Peak Hours

Alameda County

 I-880, northbound from Dixon Landing Road to Mission Boulevard, from Decoto Road to Fremont Boulevard, and from Alvarado-Niles Road to Tennyson Road – PM Peak Hour





Figure 8 Existing Freeway Levels of Service - Mixed-Flow Lanes - AM Peak Hour









Figure 9 Existing Freeway Levels of Service - Mixed-Flow Lanes - PM Peak Hour









Figure 10 Existing Freeway Levels of Service - HOV Lanes - AM Peak Hour









Figure 11 Existing Freeway Levels of Service - HOV Lanes - PM Peak Hour





Existing Freeway Ramp Capacity Analysis

This analysis consisted of a volume-to-capacity ratio evaluation of 32 freeway ramps at the interchanges of SR 237/Lawrence Expressway, SR 237/Mathilda Avenue, SR 237/Maude Avenue, SR 237/Middlefield Road, US 101/Lawrence Expressway, US 101/Fair Oaks Avenue, and US 101/Mathilda Avenue. The ramp capacities were obtained from the *Highway Capacity Manual 2000*, which considers both the free-flow speed and the number of lanes on the study ramps. It is assumed that the US 101 northbound on-ramps and the SR 237 westbound on-ramps, where applicable, are metered during the AM peak hour, and the US 101 southbound on-ramps and the SR 237 eastbound on-ramps, where applicable, are metered during the PM peak hour. Ramp capacity for the metered ramps is obtained from the *Ramp Management and Control Handbook* published by the Federal Highway Administration. The maximum ramp meter rate of 900 vph is assumed for a single lane on-ramp. For a double lane on-ramp, the ramp meter rate of 1,600 vph is assumed. For the purpose of this study, HOV lanes are assumed to have a capacity of 900 vph regardless of ramp meters. Existing peak hour ramp volumes were obtained through personal communication with Caltrans staff Jordan Chan on August 11, 2015. Table 6 shows the peak hour ramp volumes.

The ramp analysis showed that all freeway ramps currently have sufficient capacity to serve the existing traffic volumes. All study ramps have a volume-to-capacity (V/C) ratio that is below 1.0, which means that the existing traffic demand is lower than the ramp capacity.

Table 6 Existing Freeway Ramp Capacity Analysis

								Existing	
Interchange	Ramp	Туре	Peak	Mixed	Lanes HOV	Meter	Capacity ¹	Peak Volume ²	V/C
SR 237/Lawrence Expwy	EB on-ramp from NB Lawrence Expwy	Diagonal	AM	1	1		2900	1513	0.52
			PM	1	1	ON	1800	1206	0.67
	WB on-ramp from NB Lawrence Expwy	Loop	AM	1			1800	228	0.13
			PM	1			1800	253	0.14
	WB on-ramp from SB Lawrence Expwy	Diagonal	AM	1			2000	245	0.12
			PM	1			2000	312	0.16
	EB on-ramp from SB Lawrence Expwy	Loop	AM	1			1800	120	0.07
	ED off rome to SD Lowronce Evenus	Diagonal	PIVI	1			1800	133	0.41
	EB off-ramp to SB Lawrence Expwy	Diagonai		1			2000	190	0.10
	EB off-ramp to NB Lawrence Expwy	Loop		1			1800	127	0.13
		Loop	PM	1			1800	81	0.07
	WB off-ramp to NB Lawrence Expwy	Diagonal	AM	1			2000	950	0.48
	112 on ramp to 112 Lamonto 2.411)	Diagonai	PM	1			2000	499	0.25
	WB off-ramp to SB Lawrence Expwy	Loop	AM	1			1800	709	0.39
		·	PM	1			1800	732	0.41
SR 237/Mathilda Ave	EB off-ramp to Mathilda Ave	Diamond	AM	1			2000	866	0.43
			PM	1			2000	254	0.13
	EB on-ramp from Mathilda Ave	Diamond	AM	1		ON	900	864	0.96
			PM	1			2000	970	0.49
	WB off-ramp to Mathilda Ave *	Diamond	AM	1			2000	1166	0.58
			PM	1			2000	828	0.41
	WB on-ramp from Mathilda Ave	Diamond	AM	1			2000	155	0.08
			PM	1			2000	369	0.18
SR 237/Maude Ave	EB on-ramp from Maude Ave	Diamond	AM	1			2000	424	0.21
			PM	1			2000	702	0.35
	WB off-ramp to Maude Ave	Diamond	AM	1			2000	1075	0.54
			PM	1			2000	529	0.26
SR 237/Middlefield Rd	EB off-ramp to Middlefield Rd	Diamond	AM	1			2000	686	0.34
			PM	1			2000	376	0.19
	WB on-ramp from Middlefield Rd	Diamond	AM	1			2000	282	0.14
			PM	1			2000	665	0.33

Notes:

* indicates that the ramp would either be modified or newly constructed under year 2035.

1. Ramp capacities were obtained from the Highway Capacity Manual 2000, and considered the free-flow speed, the number of lanes on the

2. Existing peak hour volumes are provided by Caltrans.



Table 6 (Continued) Existing Freeway Ramp Capacity Analysis

							Existing			
Interchange	Ramp	Туре	Peak	Mixed	Lanes HOV	Meter	Capacity ¹	Peak Volume ²	V/C	
US 101/Lawrence Expwy	SB on-ramp from NB Lawrence Expwy	Diagonal	ΔΜ	2	1		4700	857	0.18	
		Blagonal	PM	2	1	ON	2500	607	0.24	
	NB on-ramp from NB Lawrence Expwy	Loop	AM	1	1	ON	1800	599	0.33	
		-	PM	1	1		2700	428	0.16	
	NB off-ramp to Lawrence Expwy	Diagonal	AM	2			3800	1188	0.31	
			PM	2			3800	1344	0.35	
	NB on-ramp from SB Lawrence Expwy	Diagonal	AM	1	1	ON	1800	420	0.23	
			PM	1	1		2900	322	0.11	
	SB on-ramp from SB Lawrence Expwy	Loop	AM	1	1		2700	297	0.11	
			PM	1	1		2700	321	0.12	
	SB off-ramp to Lawrence Expwy	Diagonal	AM	2			3800	649	0.17	
			PM	2			3800	1347	0.35	
US 101/Fair Oaks Ave	SB on-ramp from NB Fair Oaks Ave	Diagonal	AM	1	1		2900	407	0.14	
			PM	1	1		2900	253	0.09	
	SB off-ramp to NB Fair Oaks Ave	Loop	AM	1			1800	126	0.07	
			PM	1			1800	171	0.10	
	NB off-ramp to Fair Oaks Ave	Diagonal	AM	1			2000	739	0.37	
	NP on romp from Eair Oaka Ava	Diagonal		1	1	ON	2000	853	0.43	
	NB 01-14110 II011 Fail Oaks Ave	Diagonal	PM	1	1	ON	2900	402	0.34	
	SB off-ramp to SB Fair Oaks Ave	Diagonal	AM	1	•		2000	246	0.12	
	I I	5	PM	1			2000	686	0.34	
	SB on-ramp from SB Fair Oaks Ave	Loop	AM	1	1		1800	215	0.12	
			PM	1	1		1800	430	0.24	
US 101/Mathilda Ave	SB on-ramp from NB Mathilda Ave	Diagonal	AM	1	1		2900	554	0.19	
			PM	1	1		2900	488	0.17	
	NB on-ramp from Mathilda Ave	Loop	AM	1	1	ON	1800	314	0.17	
			PM	1	1		2700	247	0.09	
	NB off-ramp to NB Mathilda Ave *	Diagonal	AM	1			2000	658	0.33	
			PM	1			2000	188	0.09	
	NB off-ramp to SB Mathilda Ave *	Loop	AM	1			1800	621	0.35	
			PM	1			1800	738	0.41	
	SB on-ramp from SB Mathilda Ave	Loop	AM	1	1		2700	111	0.04	
			PM	1	1	ON	1800	1059	0.59	
	SB off-ramp to SB Mathilda Ave	Diagonal	AM	1			2000	337	0.17	
			PM	1			2000	442	0.22	

Notes:

* indicates that the ramp would either be modified or newly constructed under year 2035.

1. Ramp capacities were obtained from the *Highway Capacity Manual 2000*, and considered the free-flow speed, the number of lanes on the 2. Existing peak hour volumes are obtained through personal communication with Caltrans staff Jordan Chan on August 11, 2015.

3. Current GP Conditions

This chapter presents a summary of the traffic conditions that would occur under the current GP traffic volumes. The current GP scenario assumes the adopted City of Sunnyvale General Plan, regional growth, and the Apple Campus II project in the City of Cupertino. The Sunnyvale Travel Demand Forecasting Model (STFM) for year 2035 was used to forecast the Current GP traffic volumes. Model assumptions and inputs are described in this chapter as well.

Traffic Volumes and Roadway Network

The 2035 forecasts of intersection turning movements, freeway traffic, ramp volumes, and vehicle miles traveled (shown on Table 17 in Chapter 4) were completed using the Sunnyvale Travel Demand Forecasting Model (STFM). The STFM is a mathematical representation of travel within the nine counties in the San Francisco Bay Area, and is calibrated to represent travel within the City of Sunnyvale. The model uses socioeconomic data, such as number of jobs and households, for different geographic areas (transportation analysis zones) to predict the travel from place to place in the future. The model is adjusted (validated) using current socioeconomic data to predict current traffic volume. Model forecasts are compared to actual counts in order to make the adjustments. There are 172 transportation analysis zones within the model to represent the City of Sunnyvale.

The 2035 socioeconomic data are generated by the Association of Bay Area Governments and refined by VTA. For the Current General Plan and 2035 Proposed General Plan model forecasts, socioeconomic data were supplied by the Sunnyvale Planning Department. Table 7 shows the model inputs for the entire bay area separated by counties. Table 8 shows the model inputs for Sunnyvale, Santa Clara, Mountain View, and Cupertino.

	Year 2	2035 Socioeconomic	: Data
County	Households	Population	Total Jobs
San Francisco	429,886	1,000,785	733,565
San Mateo	305,826	858,898	433,295
Santa Clara	783,400	2,255,661	1,226,122
Alameda	677,886	1,848,119	910,613
Contra Costa	447,099	1,263,667	448,001
Solano	164,049	474,054	172,676
Napa	55,018	151,420	86,887
Sonoma	214,729	563,112	248,147
Marin	110,513	265,545	125,569
Santa Cruz	118,971	206,680	191,174
Monterey	183,137	388,941	336,108
San Benito	26,288	56,746	32,681
San Joaquin	316,429	0	267,479

Table 7 Current GP Model Inputs – Network-Wide

Table 8

Current GP Model Inputs – Sunnyvale, Santa Clara, Mountain View, and Cupertino

	Sunnyvale		Santa	Clara	Mountain View Cupertino			ertino	0	
	2013 Existing	Current GP	2013 Existing	Year 2035	2013 Existing	Year 2035	Apple Ca 2013 Existing	mpus II Year 2035	Rest of C 2013 Existing	Cupertino Year 2035
Households	57,000	66,750	41,366	50,804	33,255	40,199	0	0	23,412	27,731
Population	147,055	150,725	109,295	136,350	76,805	94,292	0	0	67,099	80,056
Total Jobs	82,000	109,600	109,737	134,627	53,970	65,763	2,904	10,928	27,886	34,461

The STFM includes improvements to the roadway network as part of the Valley Transportation Plan (VTP) and the Sunnyvale Transportation Impact Fee (TIF). Significant roadway improvements that are funded or planned to be funded within or near Sunnyvale are listed below:

- Construct auxiliary lanes on eastbound SR 237 between Mathilda Avenue and Fair Oaks Avenue.
- Extend express lanes on SR 237 to SR 85.
- Construct auxiliary lanes on southbound US 101 between Lawrence Expressway and Great America Parkway, and between Ellis Street and SR 237.
- Construct auxiliary lanes on southbound SR 85 between SR 237 and El Camino Real.
- Reconstruct the US 101/Mathilda and SR 237/Mathilda interchanges.
- Widen the ramp from northbound SR 85 to eastbound SR 237 to two lanes. Construct an auxiliary lane on eastbound SR 237 from SR 85 to Middlefield Road.
- Construct a loop on-ramp from westbound Middlefield Road to westbound SR 237. Eliminate the intersection at Middlefield Road and westbound SR 237 off-ramp, and re-align the off-ramp to the intersection on Middlefield Road at Ferguson Drive.
- Extend Mary Avenue north over the SR 237/US 101 interchange via a flyover and connect with Enterprise Way.
- Construct grade separations on Lawrence Expressway at the intersections with Reed Avenue/Monroe Street, Kifer Road, and Arques Avenue.
- Construct auxiliary lane on southbound Lawrence Expressway between the SR 237 loop ramps.
- Construct auxiliary lanes on Central Expressway between Mary Avenue and Lawrence Expressway.
- Widen Central Expressway between Lawrence Expressway and San Tomas Expressway to six lanes.

The forecast intersection turning movement volumes were adjusted based on existing volumes to generate the current GP traffic volumes. The current GP traffic volumes are shown on Figure 12.





HEXAGON






HEXAGON











Intersection Lane Configurations under Current GP Conditions

The following intersection improvements were assumed under the Current GP conditions.

- Intersections on Lawrence Expressway at Reed Avenue/Monroe Street, Kifer Road, and Arques Avenue are planned for grade separations. The lane configurations at these three intersections under current GP conditions assume the proposed concept detailed in the *Lawrence Expressway Grade Separation Concept Study Final Report*, published on September 30, 2014 (shown on Figure 13). These interchanges are planned to be funded.
- As identified in the *Valley Transportation Plan 2040*, the intersection at SR 237 westbound off-ramp and Middlefield Road is planned to be eliminated. The SR 237 westbound off-ramp would instead be re-aligned to the intersection at Ferguson Drive and Middlefield Road.
- As identified in the *Valley Transportation Plan 2040*, Central Expressway is planned to be widened to six lanes between Lawrence Expressway and San Tomas Expressway. The eastbound and westbound legs at the Intersections on Central Expressway at Oakmead Parkway and at Bowers Avenue would be widened to three through lanes from the existing two through lanes.
- As documented in the 3333 Scott Boulevard Office Development Draft Supplemental EIR, published in April 2015, the 3333 Scott Boulevard project would construct a second eastbound left-turn lane at the intersection of Bowers Avenue and Scott Boulevard. This intersection improvement is assumed under the current GP conditions.
- As documented in the *Cupertino General Plan Amendment Draft EIR*, published in June 2014, the City of Cupertino assumed that the Apple Campus 2 project would implement a number of intersection improvements. The following intersection improvements were assumed under the current GP conditions:
 - Wolfe Road & I-280 Northbound Ramp: the I-280 northbound off-ramp would be widened to a total of 2 left-turn and 2 right-turn lanes.
 - I-280 Southbound Ramp & Stevens Creek Boulevard: the eastbound leg would be widened to include an exclusive right-turn lane.
 - De Anza Boulevard & Homestead Road: the southbound leg would be widened to include a dedicated right-turn lane.
 - Lawrence Expressway Northbound Ramp & Stevens Creek Boulevard: the northbound leg would be widened to a total of 2 left-turn lanes, 1 shared left-through lane, 1 shared throughright lane, and 1 exclusive right-turn lane.
 - Lawrence Expressway & I-280 Southbound Ramp: the eastbound leg would be widened to include a total of 1 shared left-through lane, 1 through lane, and 1 exclusive right-turn lane.

Lane configurations at all other study intersections under current GP conditions are assumed to be the same as under existing conditions. The intersection lane configurations under the current GP conditions are shown on Figure 14.





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City of Sunnyvale Land Use and Transportation Element Update TIA

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Intersection Levels of Service under Current GP Conditions

Intersection levels of service results under current GP conditions are presented in Table 9, and graphically shown on Figure 15. The level of service results show that the following intersections would operate at an unacceptable level of service:

- Lawrence Expressway & Tasman Drive (#11) PM Peak Hour (LOS F)
- Lawrence Expressway & Lakehaven Drive (#12) PM Peak Hour (LOS F)
- Lawrence Expressway & Oakmead Parkway (#15) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Arques Avenue (#16) PM Peak Hour (LOS F)
- Lawrence Expressway & Kifer Road (#17) AM Peak Hour (LOS F)
- Duane/Stewart & Duane Avenue (#19) AM Peak Hour (LOS F)
- Wolfe Road & Kifer Road (#24) PM Peak Hour (LOS F)
- Wolfe Road & Fremont Avenue (#29) AM & PM Peak Hours (LOS F)
- Fair Oaks Avenue & Arques Avenue (#31) AM & PM Peak Hours (LOS E+ & LOS F, respectively)
- Fair Oaks Avenue & El Camino Real (#34) PM Peak Hour (LOS F)
- Sunnyvale-Saratoga Road & Remington Drive (#40) PM Peak Hour (LOS F)
- Mary Avenue & Maude Avenue (#51) PM Peak Hour (LOS E+)
- Mary Avenue & Central Expressway (#52) AM & PM Peak Hours (LOS F)
- Mary Avenue & Fremont Avenue (#55) AM & PM Peak Hours (LOS F)
- SR 85 Northbound Ramp & Fremont Avenue (#59) AM Peak Hour (LOS E+)
- SR 85 Southbound Ramp & Fremont Avenue (#60) AM & PM Peak Hours (LOS E- & LOS F, respectively)
- Ellis Street & Middlefield Road (#63) PM Peak Hour (LOS F)
- Grant Road & El Camino Real (#67) AM Peak Hour (LOS F)
- Lawrence Expressway & Cabrillo Avenue (#82) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Benton Street (#84) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Homestead Road (#85) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Pruneridge Avenue (#86) AM Peak Hour (LOS F)
- Lawrence Expressway & I-280 Southbound Ramp (#90) AM & PM Peak Hour (LOS F and LOS E+, respectively)
- Oakmead Parkway & Central Expressway (#92) PM Peak Hour (LOS F)
- Bowers Avenue & Central Expressway (#95) AM & PM Peak Hours (LOS F)
- Bowers Avenue & Kifer Road (#96) PM Peak Hour (LOS F)
- Bowers Avenue & Monroe Street (#98) PM Peak Hour (LOS F)

The unacceptable levels of services at these intersections are due to a combination of both Sunnyvale and regional growth. Within the City of Sunnyvale, regional traffic contributes approximately 20 to 50 percent of total traffic on regional roadways such as Lawrence Expressway, Sunnyvale-Saratoga Road, and El Camino Real.

The intersections on Mathilda Avenue at the SR 237 ramps are proposed to be reconstructed under the current GP conditions. At the time of this report, the proposed intersection configurations have not been finalized. Therefore, this report assumes that the intersections at the Mathilda Avenue/SR 237 interchange will operate at an acceptable LOS D under the current GP conditions.



City of Sunnyvale Land Use and Transportation Element Update TIA





Table 9

Current GP Intersection Levels of Service Summary

			Peak	Count	Exist Avg. Delav	ting	Current G Avg. Delay	
#	Intersection	СМР	Hour	Date	(sec)	LOS	(sec)	LOS
1	Mathilda Ave & Java Dr	*	AM PM	01/00/15 10/01/14	26.6 28.0	С С	25.2 27.1	С С
2	Mathilda Ave & 5th Ave	+	AM PM	06/04/15	13.5 22.1	B C+	15.0 36.2	B D+
3	Mathilda Ave & Innovation Way	+	AM PM	06/04/15 06/04/15	18.5 19.8	В- В-	17.3 20.6	B C+
4	Mathilda Ave & SR 237 WB ¹	+	AM PM	06/04/15 06/04/15	-	E	-	D D
5	Mathilda Ave & SR 237 EB ¹	+	AM PM	06/04/15 06/04/15	-	E E	:	D D
6	Crossman Ave & Caribbean Dr	+	AM PM	05/14/15 05/14/15	10.3 36.0	B+ D+	23.6 18.7	C B-
7	Crossman Ave & Java Dr		AM PM	11/00/14 11/00/14	17.0 29.4	B C	24.6 41.9	C D
8	Fair Oaks Ave & Tasman Dr		AM PM	06/04/15 06/04/15	17.1 19.4	B B-	20.0 27.9	C+ C
9	Fair Oaks Ave & Weddell Dr		AM PM	06/04/15 06/04/15	19.0 13.8	B- B	24.6 12.5	C B
10	N Fair Oaks Ave & US 101 NB		AM PM	10/00/14 10/00/14	16.5 21.0	B C+	49.1 42.0	D
11	Lawrence Expwy & Tasman Dr	*	AM PM	05/18/15 05/18/15	40.2 64.8	DE	58.6 128.5	E+ F
12	Lawrence Expwy & Lakehaven Dr	+	AM PM	05/18/15 05/18/15	59.6 63.5	E+ E	72.3 155.3	E
13	Lawrence Expwy & US 101 NB	+	AM PM	05/22/15	21.7 24.4	C+ C	48.3 29.9	D C
14	Lawrence Expwy & US 101 SB	+	AM PM	05/18/15	15.1 43.1	B D	11.4 33.0	B+ C-
15	Lawrence Expwy & Oakmead Pkwy	+	AM PM	05/18/15	48.7	D F+	148.1 150.1	F
16	Lawrence Expwy & Arques Ave ²	*	AM	05/18/15	66.6 95.5	E	28.2 97 9	C F
17	Lawrence Expwy & Kifer Rd ²	+	AM	05/18/15	168.2 81.0	F F	83.5	F D
18	Lawrence Expwy & Reed Ave/Monroe St ²	*	AM PM	05/18/15 05/18/15	203.1 86.5	F F	48.7 28.4	D C

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. At the intersections at the Mathilda/SR 237 interchange, the calculated LOS does not reflect the unmet vehicle demand that cannot get through the intersections during the peak hours. The LOS reflect the micro-simulation analysis results using Synchro/Sim Traffic software. The Mathilda/SR 237 interchange is expected to be reconstructed under the current GP and 2035 proposed GP conditions. The proposed lane geometry at the intersections are not finalized at the time of this report. It is assumed that these two intersections would operate at an acceptable LOS D in year 2035.

2. The intersections of Lawrence/Arques, Lawrence/Kifer, and Lawrence/Reed-Monroe all assume grade separations for all future scenarios.

Current GP Intersection Levels of Service Summary

#	Intersection	СМР	Peak Hour	Count Date	Exist Avg. Delay (sec)	ting LOS	Currei Avg. Delay (sec)	nt GP LOS
19	Duane/Stewart & Duane Ave		AM PM	10/00/14 10/00/14	31.4 30.6	C C	110.1 32.7	F C-
20	N Fair Oaks Ave & Duane Ave		AM PM	10/00/14 10/00/14	26.3 32.1	C C-	32.5 43.0	C- D
21	Fair Oaks Ave & Maude Ave ¹		AM PM	N/A N/A	28.6 28.5	C C	32.5 36.3	C- D+
22	Wolfe Rd & Stewart Dr		AM PM	10/00/14 10/00/14	16.1 19.1	В В-	23.3 22.9	C C+
23	Wolfe Rd & Arques Ave		AM PM	10/00/14 10/00/14	24.8 28.4	C C	40.5 39.1	D D
24	Wolfe Rd & Kifer Rd		AM PM	05/00/14 05/00/14	21.1 26.8	C+ C	34.2 161.9	C- F
25	Wolfe Rd & Evelyn Ave		AM PM	05/00/14 05/00/14	26.0 24.6	C C	52.4 44.9	D- D
26	Wolfe Rd & Reed Ave		AM PM	05/00/14 05/00/14	28.8 28.8	C C	40.6 42.1	D D
27	Evelyn Ave & Reed Ave		AM PM	05/14/15 05/14/15	10.8 18.9	В+ В-	11.5 18.1	В+ В-
28	Wolfe Rd & El Camino Real	*	am Pm	05/00/14 09/19/14	49.8 55.1	D E+	56.4 79.5	E+ E-
29	Wolfe Rd & Fremont Ave		AM PM	05/00/14 05/00/14	48.9 49.8	D D	60.9 87.6	E F
30	Wolfe Rd & Homestead Rd		am Pm	05/00/14 05/00/14	30.9 31.9	C C	32.3 37.9	C- D+
31	Fair Oaks Ave & Arques Ave		am Pm	05/14/15 05/14/15	29.7 34.4	C C-	58.7 81.1	E+ F
32	N Fair Oaks Ave & Evelyn Ave		am Pm	05/14/15 05/14/15	28.1 26.7	C C	31.8 29.5	C C
33	N Fair Oaks Ave & Old San Francisco		AM PM	05/14/15 05/14/15	35.4 36.7	D+ D+	39.5 49.4	D D
34	Fair Oaks Ave & El Camino Real	*	AM PM	05/00/14 10/15/14	34.9 39.3	C- D	42.2 87.2	D F
35	Sunnyvale Ave & Evelyn Ave	+	AM PM	05/14/15 05/14/15	24.6 27.9	C C	33.6 36.0	C- D+
36	Sunnyvale Ave & Washington Ave	+	AM PM	05/14/15 05/14/15	17.7 20.3	B C+	14.1 23.8	B C

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. Existing volumes for the Fair Oaks/Maude intersection is extrapolated based on 2013 counts.

Current GP Intersection Levels of Service Summary

#	Intersection	СМР	Peak Hour	Count Date	Exist Avg. Delay (sec)	ting LOS	Curren Avg. Delay (sec)	nt GP
37	Sunnyvale Ave & McKinley Ave	+	AM	05/14/15	15.8	B	21.8	C+
38	Sunnyvale Ave & Iowa Ave	+	AM	05/14/15	12.8 16.0	B B B	12.1 18.4	B B-
39	Sunnyvale Ave & El Camino Real	+	AM PM	05/14/15 05/14/15	23.3 30.0	C C	28.6 40.2	C D
40	Sunnyvale-Saratoga Rd & Remington Dr	*	AM PM	05/14/15 09/19/14	42.2 45.8	D D	53.8 82.5	D- F
41	Sunnyvale-Saratoga Rd & Fremont Ave	*	AM PM	05/00/14 10/01/14	34.7 45.7	C- D	40.3 59.4	D E+
42	Mathilda Ave & Almanor Ave	+	AM PM	06/04/15 06/04/15	17.1 27.1	B C	23.9 42.7	C D
43	Mathilda Ave & Maude Ave	*	AM PM	06/04/15 09/18/14	39.0 40.4	D+ D	41.4 51.6	D D-
44	Mathilda Ave & Indio Way	+	AM PM	06/04/15 06/04/15	24.5 24.9	C C	34.4 26.9	C- C
45	Mathilda Ave & California	+	AM PM	06/04/15	19.9 25.3	B- C	29.4 41.2	C D
46	Mathilda Ave & McKinley Ave	+	AM PM	06/04/15	15.1 16.4	B	19.8 29.3	B- C
47	Mathilda Ave & Iowa Ave	+	AM PM	06/04/15	13.1 16.7	B	14.0 31.5	С С
48	Mathilda Ave & El Camino Real	Ŷ.	AM PM	06/04/15	44.0	D	74.6	E
49	Hollenbeck Ave & El Camino Real	+	AM PM	05/14/15	27.9 28.9	C C	38.7 67.2	D+ E
50	Hollenbeck Ave & Fremont Ave		PM	05/00/14	34.6 36.7	D+	39.0 42.7	D
51	Mary Ave & Maude Ave	*	PM	05/14/15	25.8 29.1	C	30.2 59.9	E+
52	Mary Ave & Central Expwy		PM	05/22/15	50.0 61.6	E	90.2 149.3	F
53	Mary Ave & Evelyn Ave	*	PM	05/14/15	30.0 30.3	C	38.6 34.7	D+ C-
54	Iviary Ave & El Camino Real		PM	09/19/14	37.3 37.8	D+ D+	45.0 78.6	E-

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

Current GP Intersection Levels of Service Summary

#	Intersection	СМР	Peak Hour	Count Date	Exist Avg. Delay (sec)	ting LOS	Currei Avg. Delay (sec)	nt GP LOS
55	Mary Ave & Fremont Ave		AM PM	05/00/14 05/00/14	41.8 42.0	D D	93.7 119.0	F F
56	Bernardo Ave & Evelyn Ave		AM PM	05/12/15 05/12/15	24.3 19.0	C B-	25.3 24.3	C C
57	Bernardo Ave & El Camino Real	+	AM PM	05/14/15 05/14/15	40.1 35.6	D D+	41.2 43.5	D D
58	Bernardo Ave & Fremont Ave		AM PM	05/00/14 05/00/14	26.6 22.6	C C+	28.4 26.6	C C
59	SR 85 NB & Fremont Ave		AM PM	05/00/14 05/00/14	30.3 26.6	C C	55.9 31.4	Е+ С
60	SR 85 SB & Fremont Ave		AM PM	05/00/14 05/00/14	37.5 31.6	D+ C	75.8 202.2	E- F
61	Mathilda Ave & San Aleso Ave	+	AM PM	06/04/15 06/04/15	12.6 17.3	B B	11.7 35.0	B+ D+
62	Ellis St & Fairchild Dr (MV)		AM PM	09/15/15 09/15/15	14.7 16.4	B B	15.6 20.2	B C+
63	Ellis St & Middlefield Rd (MV)		AM PM	09/15/15 09/15/15	16.7 18.0	B B	40.9 80.7	D F
64	Ferguson Dr & Middlefield Rd (MV)		AM PM	09/15/15 09/15/15	7.4 9.7	A A	50.5 33.7	D C-
65	Bernardo Avenue & Middlefield Rd (MV)		AM PM	09/15/15 09/15/15	9.7 15.4	A B	11.0 19.9	В+ В-
66	Sylvan Ave & El Camino Real (MV)		am Pm	N/A N/A	31.5 28.2	C C	33.8 34.6	C- C-
67	Grant Rd & El Camino Real (MV)	*	am Pm	N/A 09/23/14	51.0 58.3	D- E+	81.9 69.9	F E
68	SR 237 EB & Middlefield Rd (MV)		am Pm	09/15/15 09/15/15	21.8 16.6	C+ B	21.6 16.8	C+ B
69	SR 237 WB & Middlefield Rd (MV) ¹		am Pm	09/15/15 09/15/15	20.2 19.6	С+ В-	:	2
70	SR 237 Service Road & Maude Ave		AM PM	09/15/15 09/15/15	29.2 34.7	C C-	35.0 38.2	C- D+
71	Mathilda Ave & Olive Ave	+	AM PM	06/04/15 06/04/15	13.7 16.9	B B	19.4 30.6	B- C
72	Mathilda Ave & Washington Avenue	+	AM PM	06/04/15 06/04/15	32.2 32.0	C- C-	43.4 47.1	D D
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Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

MV indicates that the intersection is within the City of Mountain View.

1. The SR 237 WB off-ramp at Middlefield Road is assumed moved to be aligned with Ferguson Road. Therefore, intersection #69 SR 237 WB ramp & Middlefield Rd would not exist under either Current GP or 2035 Proposed GP conditions.



Current GP Intersection Levels of Service Summary

#	Intersection	СМР	Peak	Count	Exist Avg. Delay	ting	Currei Avg. Delay	nt GP
<i>#</i>			Tioui	Date	(360)	LOU	(360)	LOO
73	Sunnyvale-Saratoga Road & Homestead Road (CUP)	*	AM PM	05/05/15 09/18/14	34.9 34.2	C- C-	47.7 54.7	D D-
74	Hollenbeck Avenue & Homestead Road		AM PM	09/15/15 09/15/15	32.7 35.5	C- D+	34.2 38.9	C- D+
75	Mary Ave & Homestead Road		AM PM	09/15/15 09/15/15	25.5 24.8	C C	26.1 29.0	C C
76	Bernardo Avenue & Homestead Road		AM	09/15/15	15.5 13.7	B	17.7 13.6	B
77	SR 85 SB Ramp & Homestead Road		AM PM	09/15/15	15.4 18.0	B	32.9 25.1	C- C
78	De Anza Blvd & I-280 NB Ramps (CUP) ¹	*	AM	N/A 09/18/14	37.3	D+ C	42.4 43.0	D
79	De Anza Blvd & I-280 SB Ramps (CUP) ¹	*	AM	N/A	38.5	D+ C+	40.0	D
80	Wolfe Rd & I-280 NB Ramps (CUP) ¹	*	AM	N/A	12.4	B B+	13.3	B
81	Wolfe Rd & I-280 SB Ramps (CUP) ¹	*	AM	N/A	15.9	B	11.2	B+
82	Lawrence Expwy & Cabrillo Ave (SCL)	+	AM	09/19/13	75.9	E-	143.5	F
83	Lawrence Expwy Ramps & El Camino Real	*	AM	N/A	30.7	C	33.6	C-
	(SCL) '		PM	09/17/14	29.7	C	33.5	C-
84	Lawrence Expwy & Benton St (SCL)	+	AM PM	09/19/13 09/10/13	81.0 55.5	F E+	182.7 140.9	F
85	Lawrence Expwy & Homestead Road (SCL)	*	AM PM	09/19/13 09/10/13	84.5 80.3	F F	118.6 147.8	F F
86	Lawrence Expwy & Pruneridge Ave (SCL)	+	AM PM	09/19/13	67.3 36.6	E D+	111.5	F F-
87	Lawrence Expwy SB & Stevens Creek Blvd (SCL)	*	AM	05/07/15	20.6	C+	27.8	C
88	Lawrence Expwy NB & Stevens Creek Blvd (SCL)	*	AM	05/07/15	32.3	C-	30.1	C
89	I-280 SB Ramp & Stevens Creek Blvd (SCL)	*	AM	09/30/14	28.6	C	27.1 26.6	C
90	Lawrence Expwy & I-280 SB (SJ)	*	PM AM PM	10/09/14 09/19/13 09/17/13	30.3 63.4 35.6	С Е D+	42.4 121.3 59.3	D F E+

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

CUP indicates that the intersection is within the City of Cupertino.

SJ indicates that the intersection is within the City of San Jose. All intersections within the City of San

1. Existing AM volumes for the Wolfe/I-280 ramps, De Anza/I-280 ramps, and the Lawrence Ramps/El

Camino Real intersections are extrapolated based on 2011 counts.



Current GP Intersection Levels of Service Summary

#	Intersection	СМР	Peak Hour	Count Date	Exist Avg. Delay (sec)	ting LOS	Curren Avg. Delay (sec)	nt GP LOS
91	Oakmead Pkwy & Arques Ave		AM PM	09/15/15 09/15/15	21.2 23.9	C+ C	25.2 26.5	C C
92	Oakmead Pkwy & Central Expwy (SCL)	*	AM PM	09/26/13 09/10/13	35.6 43.9	D+ D	59.4 81.3	E+ F
93	Corvin Dr & Kifer Road (SCL)		AM PM	06/02/15 06/02/15	8.0 9.4	A A	13.2 10.4	B B+
94	Bowers Ave & Scott Blvd (SCL)	*	AM PM	08/19/14 09/17/14	29.9 30.8	C C	31.5 34.0	C C-
95	Bowers Ave & Central Expwy (SCL)	*	AM PM	09/19/13 09/19/13	63.4 63.0	E E	139.1 154.7	F F
96	Bowers Ave & Kifer Road (SCL)		AM PM	08/20/14 08/20/14	26.5 28.2	C C	31.6 84.4	C F
97	Calabazas Blvd & Monroe St (SCL)		AM PM	10/02/13 10/02/13	8.6 5.6	A A	9.2 4.2	A A
98	Bowers Ave & Monroe St (SCL)		AM PM	01/08/14 01/08/14	30.8 32.6	C C-	42.2 116.9	D F

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

4. 2035 Proposed GP Conditions

This chapter presents a summary of the traffic conditions that would occur with the 2035 proposed GP traffic volumes. The 2035 proposed GP scenario assumes the proposed 2035 General Plan, which consists of the Lawrence Station Area Plan (LSAP), the Peery Park Specific Plan (PPSP), the Land Use and Transportation Element (LUTE) of the proposed GP, and regional growth. Potential impacts related to the LUTE are analyzed within the context of the 2035 proposed GP conditions. The Sunnyvale Travel Demand Forecasting Model (STFM) for year 2035 was used to forecast the 2035 Proposed GP conditions are first compared to existing conditions to disclose cumulative impacts related to the LUTE, as part of the CEQA analysis. The 2035 proposed GP conditions for information purposes only.

Methodology for Determining Intersection Impacts

Intersection levels of service under the 2035 proposed GP conditions are evaluated relative to existing conditions to determine the potential significant impacts of the proposed GP. This set of impacts is denoted as the cumulative impacts, and is determined based on the intersection impact criteria discussed in Chapter 1.

The Sunnyvale Travel Demand Forecasting Model (STFM) was used to forecast the 2035 proposed traffic volumes. The STFM included three proposed land use changes within the City of Sunnyvale, the Lawrence Station Area Plan (LSAP), Peery Park Specific Plan (PPSP), and Land Use and Transportation Element (LUTE). In addition to growth within Sunnyvale, the STFM includes regional growth for cities within nine Counties. This regional growth is consistent with approved General Plans and regional transportation models.

Since other land uses besides the LUTE are included in the model, the 2035 traffic analysis included traffic volumes not only from the LUTE, but also from the PPSP, LSAP, and other cities. These are referred to as cumulative traffic volumes or results. If an intersection was identified to have a cumulative impact by all these land use changes, a separate analysis had to be completed to determine if the LUTE had a significant impact on its own. To accomplish this, LUTE traffic was segregated from all other traffic. Once the LUTE traffic was segregated, each cumulatively impacted intersection was analyzed to determine whether the LUTE traffic would cause an impact on its own by calculating the level of LUTE traffic volumes and the level of traffic volumes required to cause an impact.

This process was completed through a full technical analysis. The volumes attributable to each land use were estimated using the select zone analysis within the STFM. Regional traffic was defined as trips that have neither a trip origin nor destination within the City of Sunnyvale. The threshold for a significant contribution at each impacted intersection was calculated by determining the critical amount of traffic growth between the 2035 proposed GP and existing conditions that would generate a significant intersection impact. The LUTE caused a significant intersection impact if the Project-related traffic alone exceeded the threshold for a significant contribution, compared with existing conditions.



Traffic Volumes and Roadway Network

The 2035 forecasts of intersection turning movements, freeway traffic, ramp volumes, and vehicle miles traveled (shown on Table 17 below) were completed using the Sunnyvale Travel Demand Forecasting Model (STFM). Table 10 shows the total jobs and households attributable to each of the LSAP, PPSP, and LUTE that were input into the model for Sunnyvale for the 2035 Proposed General Plan scenario. Between the 2035 proposed GP and current GP scenarios, it is assumed that growth outside of Sunnyvale is constant. Tables 7 and 8 in Chapter 3 present growth outside of Sunnyvale between existing and current GP scenarios.

The LSAP and the PPSP study areas are managed by separate plans, and are thus not included in the proposed LUTE.

The LUTE as part of the 2035 proposed GP proposes no vehicular capacity improvements in addition to the roadway network changes assumed under the Current GP conditions. The LSAP proposes a road diet on Kifer Road within its study area. Kifer Road within the LSAP study area would be narrowed from the existing 5-lanes to 3-lanes (one lane in each direction and a two-way center left-turn lane). As part of the road diet, Kifer Road would receive enhanced bicycle and pedestrian facilities.

The forecasted intersection turning movement volumes were adjusted based on existing volumes to generate the 2035 proposed GP traffic volumes. The 2035 proposed GP traffic volumes are shown on Figure 16.

The intersection lane configurations under the 2035 proposed GP conditions are shown on Figure 17.



Table 10 2035 Proposed GP Model Inputs

		Sunnyvale		LS	LSAP Plan Area		PPSP Study Area			LUTE Study Area		
	2013 Existing	Current GP	2035 Propose d GP	2013 Existing	Current GP	2035 Propose d GP	2013 Existing	Current GP	2035 Propose d GP	2013 Existing	Current GP	2035 Propose d GP
Housing Units	57,000	66,750	72,100	2,141	2,741	4,591	108	108	323	54,751	63,901	67,186
Population	147,055	150,725	174,500	4,285	5,613	10,344	785	941	941	141,985	144,171	163,215
I/O/C Square Feet (million s.f.)	47.3	55.5	59.8	5.0	5.2	6.2	8.0	9.6	11.0	34.3	40.8	42.6
Jobs	82,000	109,600	124,410	8,002	8,314	10,497	14,153	17,376	20,391	59,845	83,910	93,522









C Hexagon







C HEXAGON







Figure 16 2035 Proposed GP Traffic Volumes



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Intersection Levels of Service under 2035 Proposed GP Conditions

The level of service results for the study intersections under the 2035 proposed GP conditions are summarized in Table 11 and graphically shown on Figure 18. The results show that several of the signalized intersections would operate at unacceptable levels of service under the 2035 proposed GP conditions:

- Lawrence Expressway & Tasman Drive (#11) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Lakehaven Drive (#12) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Oakmead Parkway (#15) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Arques Avenue (#16) PM Peak Hour (LOS F)
- Duane/Stewart & Duane Avenue (#19) AM Peak Hour (LOS F)
- Wolfe Road & Arques Avenue (#23) AM Peak Hour (LOS E)
- Wolfe Road & Kifer Road (#24) AM & PM Peak Hours (LOS F)
- Wolfe Road & Reed Avenue (#26) AM Peak Hour (LOS E+)
- Wolfe Road & Fremont Avenue (#29) AM & PM Peak Hours (LOS E & LOS F, respectively)
- Fair Oaks Avenue & Arques Avenue (#31) AM & PM Peak Hours (LOS F)
- Fair Oaks Avenue & El Camino Real (#34) PM Peak Hour (LOS F)
- Sunnyvale-Saratoga Road & Remington Drive (#40) PM Peak Hour (LOS F)
- Mathilda Avenue & El Camino Real (#48) PM Peak Hour (LOS F)
- Hollenbeck Avenue & El Camino Real (#49) PM Peak Hour (LOS F)
- Mary Avenue & Maude Avenue (#51) PM Peak Hour (LOS E-)
- Mary Avenue & Central Expressway (#52) AM & PM Peak Hours (LOS F)
- Mary Avenue & El Camino Real (#54) PM Peak Hour (LOS F)
- Mary Avenue & Fremont Avenue (#55) AM & PM Peak Hours (LOS F)
- SR 85 Northbound Ramp & Fremont Avenue (#59) AM Peak Hour (LOS E)
- SR 85 Southbound Ramp & Fremont Avenue (#60) AM & PM Peak Hours (LOS F)
- Ellis Street & Middlefield Road (#63) AM Peak Hour (LOS E+)
- Lawrence Expressway & Cabrillo Avenue (#82) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Benton Street (#84) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Homestead Road (#85) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & Pruneridge Avenue (#86) AM & PM Peak Hours (LOS F)
- Lawrence Expressway & I-280 Southbound Ramp (#90) AM & PM Peak Hours (LOS F and LOS E+, respectively)
- Bowers Avenue & Central Expressway (#95) AM & PM Peak Hours (LOS F)
- Bowers Avenue & Kifer Road (#96) PM Peak Hour (LOS E)
- Bowers Avenue & Monroe Street (#98) PM Peak Hour (LOS F)

Of the 29 intersections projected to operate at unacceptable levels of service under the 2035 proposed GP conditions, four of the intersections are already operating at unacceptable levels of service under existing conditions during at least one peak hour. Twenty of the intersections would be operating at unacceptable levels of service under current GP conditions during at least one peak hour. The remaining five intersections would be operating at acceptable levels of service under both existing and current GP conditions.

The intersections on Mathilda Avenue at the SR 237 ramps are proposed to be reconstructed under the current GP and the 2035 proposed GP conditions. At the time of this report, the proposed intersection configurations have not been finalized. Therefore, this report assumes that the intersections at the Mathilda Avenue/SR 237 interchange will operate at an acceptable LOS D under the 2035 proposed GP conditions.



City of Sunnyvale Land Use and Transportation Element Update TIA





Table 11

2035 Proposed GP Intersection Levels of Service Summary – Compared to Existing Conditions

					2035 Proposed G compared to Existi Existing Conditions			GP sting		
#	Intersection	СМР	Peak Hour	Count Date	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	In Crit. Delay (sec)	Incr. In Crit. V/C
1	Mathilda Ave & Java Dr	*	AM PM	01/00/15 10/01/14	26.6 28.0	C C	36.3 30.6	D+ C	13.6 9 9	0.609 0.367
2	Mathilda Ave & 5th Ave	+	AM PM	06/04/15 06/04/15	13.5 22.1	B C+	18.8 35.2	В- D+	8.7 20.6	0.285 0.266
3	Mathilda Ave & Innovation Way	+	AM PM	06/04/15 06/04/15	18.5 19.8	В- В-	18.1 21.1	В- С+	-1.9 0.0	0.108 0.055
4	Mathilda Ave & SR 237 WB ¹	+	AM PM	06/04/15 06/04/15	-	E E	-	D D	-	-
5	Mathilda Ave & SR 237 EB ¹	+	AM PM	06/04/15 06/04/15	-	E E	-	D D	-	-
6	Crossman Ave & Caribbean Dr	+	AM PM	05/14/15 05/14/15	10.3 36.0	B+ D+	13.2 16.0	B B	-5.5 -30.8	0.242 0.476
7	Crossman Ave & Java Dr		AM PM	11/00/14 11/00/14	17.0 29.4	B C	19.5 42.2	B- D	2.7 19.5	0.186 0.308
8	Fair Oaks Ave & Tasman Dr		AM PM	06/04/15 06/04/15	17.1 19.4	В В-	22.4 34.6	C+ C-	5.9 18.9	0.334 0.387
9	Fair Oaks Ave & Weddell Dr		AM PM	06/04/15 06/04/15	19.0 13.8	B- B	23.8 14.1	C B	4.2 0.8	0.126 0.182
10	N Fair Oaks Ave & US 101 NB		AM PM	10/00/14 10/00/14	16.5 21.0	B C+	54.2 53.7	D- D-	65.6 72.5	0.422 0.258
11	Lawrence Expwy & Tasman Dr	*	AM PM	05/18/15 05/18/15	40.2 64.8	D E	92.7 117.6	F	133.9 70.7	0.190
12	Lawrence Expwy & Lakehaven Dr	+	AM PM	05/18/15 05/18/15	59.6 63.5	E+ E	84.9 164.8	F	20.8 144.0	0.335
13	Lawrence Expwy & US 101 NB	+	AM PM	05/22/15	21.7 24.4	C+ C	67.9 28.4	E C	51.7 5.9	0.365
14	Lawrence Expwy & US 101 SB	+	AM PM	05/18/15	15.1 43.1	B D	20.5 34.9	C+ C-	9.1 -8.9	0.250
15	Lawrence Expwy & Oakmead Pkwy	+	AM PM	05/18/15	48.7	D F+	150.6	F	142.3 127.5	0.418
16	Lawrence Expwy & Arques Ave ²	*	AM	05/18/15	66.6 95.5	E	46.5	D F	-25.2	0.188
17	Lawrence Expwy & Kifer Rd ²	+	AM	05/18/15	168.2	F F	64.7 29.8	E	-82.0	0.199
18	Lawrence Expwy & Reed Ave/Monroe St ²	*	AM	05/18/15	203.1	F	51.7 29.4	D- C	-329.3	0.207
				50, 10, 10		-	_3.1		00.0	001

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. The Mathilda/SR 237 interchange is expected to be reconstructed under the current GP and 2035 proposed GP conditions. The proposed lane geometry at the intersections are not finalized at the time of this report. It is assumed that these two intersections would operate at an acceptable LOS D in year 2035.

2. The intersections of Lawrence/Arques, Lawrence/Kifer, and Lawrence/Reed-Monroe all assume grade

separations for all future scenarios.

BOLD indicates a substandard level of service



2035 Proposed GP Intersection Levels of Service Summary – Compared to Existing Conditions

					Exist	ing	203 com	5 Pro pareo Con	oposed d to Exi ditions	posed GP to Existing itions		
#	Intersection	СМР	Peak Hour	Count Date	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Incr. In Crit. Delay (sec)	Incr. In Crit. V/C		
19	Duane/Stewart & Duane Ave		AM PM	10/00/14	31.4 30.6	C C	113.3	F	120.3	0.396		
20	N Fair Oaks Ave & Duane Ave		AM PM	10/00/14 10/00/14 10/00/14	26.3 32.1	C C-	47.1 54.3	D D-	41.6 42.4	0.376 0.359		
21	Fair Oaks Ave & Maude Ave ¹		AM PM	N/A N/A	28.6 28.5	C C	34.9 37.5	C- D+	11.3 12.4	0.352 0.186		
22	Wolfe Rd & Stewart Dr		AM PM	10/00/14 10/00/14	16.1 19.1	В В-	26.2 25.7	C C	13.1 7.2	0.266 0.220		
23	Wolfe Rd & Arques Ave		AM PM	10/00/14 10/00/14	24.8 28.4	C C	70.5 49.8	E D	88.8 31.1	0.738 0.507		
24	Wolfe Rd & Kifer Rd		AM PM	05/00/14 05/00/14	21.1 26.8	C+ C	124.5 113.6	F	140.5 132.2	0.755		
25	Wolfe Rd & Evelyn Ave		AM PM	05/00/14 05/00/14	26.0 24.6	C C	44.5 51.6	D D-	25.2 36.0	0.470		
26	Wolfe Rd & Reed Ave		AM	05/00/14	28.8 28.8	C C	55.8	E+	41.6	0.526		
27	Evelyn Ave & Reed Ave		AM	05/14/15	10.8	B+ B-	12.3	B B-	1.1	0.139		
28	Wolfe Rd & El Camino Real	*	AM	05/00/14	49.8	D E+	60.2 78.0	E	23.3	0.312		
29	Wolfe Rd & Fremont Ave		AM	05/00/14	48.9	D	63.0 105.8	E	12.4	0.270		
30	Wolfe Rd & Homestead Rd		AM	05/00/14	49.0 30.9 31.0	C	33.6	C-	4.7	0.131		
31	Fair Oaks Ave & Arques Ave		AM PM	05/14/15	29.7 34.4	С С С-	42.5 101.1 97.5	F	126.3 81.8	0.751		
32	N Fair Oaks Ave & Evelyn Ave		AM PM	05/14/15 05/14/15	28.1 26.7	C C	33.1 31.7	C- C	8.1 8.8	0.228		
33	N Fair Oaks Ave & Old San Francisco		AM PM	05/14/15 05/14/15	35.4 36.7	D+ D+	40.2 52.2	D D-	7.6 17.9	0.191 0.234		
34	Fair Oaks Ave & El Camino Real	*	AM PM	05/00/14	34.9 39.3	C- D	47.0	D	18.6 132.5	0.294		
35	Sunnyvale Ave & Evelyn Ave	+	AM	05/14/15	24.6 27.9	C C	36.0	D+	14.2	0.251		
36	Sunnyvale Ave & Washington Ave	+	AM PM	05/14/15 05/14/15	17.7 20.3	B C+	17.1 22.6	B C+	5.5 3.7	0.314		

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. Existing volumes for the Fair Oaks/Maude intersection is extrapolated based on 2013 counts.

BOLD indicates a substandard level of service



2035 Proposed GP Intersection Levels of Service Summa	ary – Compared to Existing Conditions
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					Frist	tina	2035 Proposed GP compared to Existin Conditions			
			Peak	Count	Avg. Delay		Avg. Delay		Incr. In Crit. Delay	Incr. In Crit.
#	Intersection	СМР	Hour	Date	(sec)	LOS	(sec)	LOS	(sec)	V/C
37	Sunnyvale Ave & McKinley Ave	+	AM PM	05/14/15 05/14/15	15.8 16.1	B B	26.7 57.5	C E+	20.1 54.4	0.432 0.609
38	Sunnyvale Ave & Iowa Ave	+	AM PM	05/14/15 05/14/15	12.8 16.0	B B	13.7 23.9	B C	4.2 12.1	0.339 0.356
39	Sunnyvale Ave & El Camino Real	+	AM	05/14/15	23.3	C	32.0	C-	10.1	0.228
40	Sunnyvale-Saratoga Rd & Remington Dr	*	AM	05/14/15	42.2	D	58.8	<u>E+</u>	23.6	0.422
41	Sunnyvale-Saratoga Rd & Fremont Ave	*	PM AM	09/19/14	45.8 34.7	D C-	43.6	F D	101.2 11.9	0.395
42	Mathilda Ave & Almanor Ave	+	РМ AM РМ	10/01/14 06/04/15 06/04/15	45.7 17.1 27.1	D B C	63.9 27.8 46.8	C	24.8 17.7 32.2	0.213
43	Mathilda Ave & Maude Ave	*	AM PM	06/04/15	39.0 40.4	D+	44.5 55.4	D F+	7.8 23.0	0.066
44	Mathilda Ave & Indio Way	+	AM	06/04/15	24.5	C C	42.8	D C-	37.7 11.9	0.188
45	Mathilda Ave & California	+	AM	06/04/15	19.9 25.3	B- C	35.8 53.2	D+ D-	26.6 43.3	0.299
46	Mathilda Ave & McKinley Ave	+	AM	06/04/15	15.1 16.4	B	21.3 23.4	C+	8.8 11 3	0.241
47	Mathilda Ave & Iowa Ave	+	AM	06/04/15	13.1	B	14.8	B	2.2	0.153
48	Mathilda Ave & El Camino Real	*	AM	06/04/15	44.0	D	76.0	E-	49.3	0.299
49	Hollenbeck Ave & El Camino Real	+	AM	05/14/15	27.9	C	60.2	E	60.5	0.603
50	Hollenbeck Ave & Fremont Ave		AM	05/00/14	28.9 34.6	C-	41.9	D	118.9	0.289
51	Mary Ave & Maude Ave		AM	05/00/14	25.8	C C	44.6 32.1	C-	7.6	0.204
52	Mary Ave & Central Expwy	*	AM	05/14/15	29.1 50.0	D	78.6 86.3	F	70.3	0.580
53	Mary Ave & Evelyn Ave		AM	05/22/15	61.6 30.0	E C	44.7	D	150.5 25.1	0.293
54	Mary Ave & El Camino Real	*	PM AM	05/14/15 05/14/15	30.3 37.3	C D+	34.9 56.4	C- E+	6.3 29.1	0.166 0.288
			PM	09/19/14	37.8	D+	109.3	F	88.2	0.439
<u>Note</u> * De + De	<u>es</u> : notes CMP intersection (LOS E threshold) enotes an intersection on a CMP roadway (LOS E t	hresho	ld)							

BOLD indicates a substandard level of service



2035 Proposed GP Intersection Levels of Service Summar	ry – Compared to Existing Conditions
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					Exist	ing	2035 Proposed C compared to Exist Conditions			l GP sting
#	Intersection	СМР	Peak Hour	Count Date	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Incr. In Crit. Delay (sec)	Incr. In Crit. V/C
55	Mary Ave & Fremont Ave		AM PM	05/00/14 05/00/14	41.8 42.0	D D	129.8 151.5	F	134.9 173.9	0.626
56	Bernardo Ave & Evelyn Ave		AM PM	05/12/15 05/12/15	24.3 19.0	С В-	28.4 23.6	C C	6.9 2.5	0.171 0.162
57	Bernardo Ave & El Camino Real	+	AM PM	05/14/15 05/14/15	40.1 35.6	D D+	44.7 47.6	D D	8.5 13.6	0.114 0.229
58	Bernardo Ave & Fremont Ave		am Pm	05/00/14 05/00/14	26.6 22.6	C C+	30.1 28.5	C C	-1.5 10.4	0.055 0.245
59	SR 85 NB & Fremont Ave		AM PM	05/00/14 05/00/14	30.3 26.6	C C	60.6 32.5	Е С-	43.4 8.7	0.306 0.266
60	SR 85 SB & Fremont Ave		AM PM	05/00/14	37.5 31.6	D+ C	87.6 221.4	F	71.5 287.2	0.236
62	Filis St & Fairchild Dr (MA)	т	PM AM	06/04/15	12.0 17.3 14.7	B	46.7 15.7	D	39.3 3 1	0.029
63	Ellis St & Middlefield Rd (MV)		PM AM	09/15/15	16.4 16.7	B	19.6 56.4	B- E+	11.5 51.3	0.355
64	Ferguson Dr & Middlefield Rd (MV)		РМ АМ	09/15/15 09/15/15	18.0 7.4	B A	45.0 51.2	D D-	32.5 56.8	0.518 0.520
65	Bernardo Avenue & Middlefield Rd (MV)		PM AM	09/15/15 09/15/15	9.7 9.7	A A	35.7 12.1	D+ B	29.2 2.9	0.418 0.083
66	Sylvan Ave & El Camino Real (MV)		PM AM	09/15/15 N/A	15.4 31.5	B C	21.6 35.3	C+ D+	7.8 7.9	0.125 0.108
67	Grant Rd & El Camino Real (MV)	*	PM AM	N/A N/A	28.2 51.0	C D-	38.3 74.8	D+ E	10.7 55.5	0.207
68	SR 237 EB & Middlefield Rd (MV)		AM	09/23/14	21.8	C+ B	79.8 21.6	E- C+	32.2 0.3	0.164
69	SR 237 WB & Middlefield Rd (MV) ¹		AM	09/15/15	20.2 19.6	C+ B-	-	-	-	-
70	SR 237 Service Road & Maude Ave		AM PM	09/15/15	29.2 34.7	C C-	34.9 39.1	C- D	6.8 4.9	0.115 0.251
71	Mathilda Ave & Olive Ave	+	AM PM	06/04/15 06/04/15	13.7 16.9	B B	22.3 33.3	C+ C-	11.7 20.3	0.256 0.273
72	Mathilda Ave & Washington Avenue	+	AM PM	06/04/15 06/04/15	32.2 32.0	C- C-	52.1 53.0	D- D-	26.7 24.5	0.230 0.233
1										

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

MV indicates that the intersection is within the City of Mountain View.

1. The SR 237 WB off-ramp at Middlefield Road is assumed moved to be aligned with Ferguson Road. Therefore, intersection #69 SR 237 WB ramp & Middlefield Rd would not exist under either Current GP or 2035 Proposed GP conditions.

BOLD indicates a substandard level of service


Table 11 (Continued)

2035 Proposed GP Intersection Levels of Service Summar	ry – Compared to Existing Conditions
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					Exist	ing	2035 Proposed GF compared to Existin Conditions				
#	Intersection	СМР	Peak Hour	Count Date	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Incr. In Crit. Delay (sec)	Incr. In Crit. V/C	
73	Sunnyvale-Saratoga Road & Homestead Road	*	AM	05/05/15	34.9 34.2	C-	56.7	E+	34.1 30.5	0.233	
74	Hollenbeck Avenue & Homestead Road		AM PM	09/15/15 09/15/15	32.7 35.5	C- D+	33.9 46.3	C- D	2.2 24.5	0.088	
75	Mary Ave & Homestead Road		AM PM	09/15/15 09/15/15	25.5 24.8	C C	26.4 30.7	C C	4.7 11.2	0.156 0.248	
76	Bernardo Avenue & Homestead Road		AM PM	09/15/15 09/15/15	15.5 13.7	B B	19.0 14.2	B- B	6.2 3.4	0.374 0.152	
77	SR 85 SB Ramp & Homestead Road		AM PM	09/15/15 09/15/15	15.4 18.0	B B	37.5 28.2	D+ C	34.1 17.6	0.315 0.153	
78	De Anza Blvd & I-280 NB Ramps (CUP) 1	*	AM PM	N/A 09/18/14	37.3 31.3	D+ C	45.3 49.7	D D	29.2 74.1	0.121	
79	De Anza Blvd & I-280 SB Ramps (CUP) ¹	*	AM PM	N/A 09/18/14	38.5 20.1	D+ C+	39.2 23.4	D C	5.4 13.0	0.036	
80	Wolfe Rd & I-280 NB Ramps (CUP) ¹	*	AM	N/A 11/09/14	12.4	B B+	13.9	B	1.6	0.072	
81	Wolfe Rd & I-280 SB Ramps (CUP) ¹	*	AM	N/A	15.9	B	11.1	B+	5.0	0.249	
82	Lawrence Expwy & Cabrillo Ave (SCL)	+	AM	09/19/13	75.9	E-	161.8	F	124.4	0.411	
83	Lawrence Expwy Ramps & El Camino Real	*	AM	N/A	30.7	C	32.6	C-	4.4	0.160	
84	(SCL) Lawrence Expwy & Benton St (SCL)	+	PM AM	09/17/14 09/19/13	29.7 81.0	F	37.5 200.5	D+	12.0 161.2	0.219 0.489	
85	Lawrence Expwy & Homestead Road (SCL)	*	PM AM	09/10/13	55.5 84.5	E+ F	168.4 113.9	F	217.6 46.0	0.455	
86	Lawrence Expwy & Pruneridge Ave (SCL)	+	AM	09/10/13	67.3 36.6	E D+	91.5 85.1	F	44.3	0.631	
87	Lawrence Expwy SB & Stevens Creek Blvd (SCL)	*	AM PM	05/07/15	20.6 25.0	C+ C	26.5 33.5	C C-	7.2	0.116	
88	Lawrence Expwy NB & Stevens Creek Blvd (SCL)	*	AM PM	05/07/15 09/30/14	32.3 28.6	C- C	30.3 26.9	C C	0.3	0.026	
89	I-280 SB Ramp & Stevens Creek Blvd (SCL)	*	AM PM	05/07/15	24.4 30.3	C C	26.6 38.5	C D+	14.9 28.0	0.215	
90	Lawrence Expwy & I-280 SB (SJ)	*	AM PM	09/19/13 09/17/13	63.4 35.6	E D+	118.2 59.8	F E+	77.8	0.220	

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

CUP indicates that the intersection is within the City of Cupertino.

SJ indicates that the intersection is within the City of San Jose. All intersections within the City of San Jose has an LOS 1. Existing AM volumes for the Wolfe/I-280 ramps, De Anza/I-280 ramps, and the Lawrence Ramps/El Camino Real intersections are extrapolated based on 2011 counts.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact



Table 11 (Continued)

2035 Proposed GP Intersection Levels of Service Summa	ary – Compared to Existing Conditions
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					Exist	2035 Proposed GP compared to Existing sting Conditions				
#	Intersection	СМР	Peak Hour	Count Date	Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Incr. In Crit. Delay (sec)	Incr. In Crit. V/C
91	Oakmead Pkwy & Arques Ave		AM PM	09/15/15 09/15/15	21.2 23.9	C+ C	24.1 32.7	C C-	4.2 17.3	0.333 0.426
92	Oakmead Pkwy & Central Expwy (SCL)	*	AM PM	09/26/13 09/10/13	35.6 43.9	D+ D	54.3 62.6	D- E	52.0 20.2	-0.096 0.217
93	Corvin Dr & Kifer Road (SCL)		AM PM	06/02/15 06/02/15	8.0 9.4	A A	15.1 16.1	B B	7.8 10.0	0.176 0.434
94	Bowers Ave & Scott Blvd (SCL)	*	AM PM	08/19/14 09/17/14	29.9 30.8	C C	37.0 39.3	D+ D	11.2 13.2	0.274 0.334
95	Bowers Ave & Central Expwy (SCL)	*	AM PM	09/19/13 09/19/13	63.4 63.0	E E	102.5 147.3	F	66.5 98.3	0.385 0.251
96	Bowers Ave & Kifer Road (SCL)		AM PM	08/20/14 08/20/14	26.5 28.2	C C	29.6 65.2	С Е	7.7 59.2	0.210 0.453
97	Calabazas Blvd & Monroe St (SCL)		AM PM	10/02/13 10/02/13	8.6 5.6	A A	9.6 4.4	A A	1.6 -1.4	0.285
98	Bowers Ave & Monroe St (SCL)		AM PM	01/08/14 01/08/14	30.8 32.6	C C-	51.1 128.9	D- F	24.9 101.2	0.431 0.477

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact



CEQA Analysis – LUTE Intersection Impacts

For CEQA purposes, the 2035 proposed GP conditions are compared against existing conditions to determine LUTE impacts. The methodology for determining LUTE intersection impacts and cumulative intersection impacts for CEQA purposes are discussed at the beginning of this chapter.

Intersections with LUTE intersection impacts are shown on Table 12 and graphically shown on Figure 19.

Table 12

2035 Proposed GP Intersection Impact Summary – Compared to Existing Conditions

				2035 Proposed GP compared to Existing Conditions									
				Δνα		Incr.	Incr	Threshold					
			Peak	Delav		Delav	In Crit	for Sig	P	ercent C	ontributi	on ¹	
#	Intersection	СМР	Hour	(sec)	LOS	(sec)	V/C	Contribution	LUTE	PPSP	LSAP	Regional	
11	Lawrence Expwy & Tasman Dr	*	AM	92.7	F	133.9	0.190	80%	77%	8%	6%	9%	
10			PM	117.6		70.7	0.456	50%	75%	8%	3%	14%	
12	Lawrence Expwy & Lakehaven Dr	+	PM	84.9	F	20.8	0.335	90% 30%	80%	5% 5%	8% 5%	7% 13%	
15	Lawrence Expwy & Oakmead Pkwy	+	AM	150.6	F	142.3	0.418	40%	70%	6%	11%	13%	
			PM	147.8	F	127.5	0.292	30%	69%	5%	9%	17%	
16	Lawrence Expwy & Arques Ave ³	*	AM	46.5	D	-25.2	0.188		000/	00/	00/	000/	
10			PM	83.7	F	-3.6	0.160	90%	66%	6%	8%	20%	
19	Duane/Stewart & Duane Ave			32.6	<u> </u>	120.3	0.396	50%	10%	5%	0%	13%	
23	Wolfe Rd & Argues Ave		AM	70.5	E	88.8	0.738	80%	55%	7%	17%	21%	
			PM	49.8	D	31.1	0.507						
24	Wolfe Rd & Kifer Rd		AM	124.5	F	140.5	0.755	60%	38%	7%	39%	16%	
			PM	113.6	F	132.2	0.590	60%	53%	7%	30%	10%	
26	Wolfe Rd & Reed Ave		AM	55.8	<u>E+</u>	41.6	0.526	90%	51%	8%	21%	20%	
20	Walfa Dd & Framant Ava		PM	51.9	D-	37.0	0.373	5.0%	669/	E 0/	110/	100/	
29	Wolfe Rd & Fremont Ave		PM	105.8	F	104 7	0.270	50%	75%	5% 3%	0%	18%	
31	Fair Oaks Ave & Arques Ave		AM	101.1	F	126.3	0.751	60%	67%	9%	6%	18%	
			PM	97.5	F	81.8	0.431	60%	79%	9%	8%	4%	
34	Fair Oaks Ave & El Camino Real	*	AM	47.0	D	18.6	0.294						
			PM	135.2	F	132.5	0.512	60%	86%	3%	4%	7%	
40	Sunnyvale-Saratoga Rd & Remington Dr	*	AM	58.8	<u>E+</u>	23.6	0.213	1	070/	-		- ~ (
40	Mathilda Ava & El Canaira Da al	*	PM	105.4	F	101.2	0.395	70%	87%	4%	4%	5%	
48	Mathilda Ave & El Camino Real			104.0	E-	49.3	0.299	70%	81%	5%	3%	8%	
49	Hollenbeck Ave & El Camino Real	+	AM	60.2	E	60.5	0.603	1070	0470	570	070	070	
			PM	102.7	F	118.9	0.581	80%	78%	7%	3%	12%	
51	Mary Ave & Maude Ave		AM	32.1	C-	7.6	0.356						
			PM	78.6	E-	70.3	0.580	80%	47%	38%	2%	13%	
52	Mary Ave & Central Expwy	*	AM	86.3	<u> </u>	51.1	0.552	90%	38%	41%	10%	11%	
54	Manu Aug & El Canalina Da al	*	PM	149.9		150.5	0.293	30%	48%	31%	6%	15%	
54	iviary Ave & El Camino Real		PM	109.3	F	29.1 88.2	0.200	80%	77%	6%	3%	14%	
55	Mary Ave & Fremont Ave		AM	129.8	F	134.9	0.626	40%	77%	7%	5%	11%	
	,		PM	151.5	F	173.9	0.747	40%	80%	4%	3%	13%	

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

1. The percent contributions are calculated for all approaches (unweighted) and relate to LSAP, Proposed LUTE, PPSP Project Trips and regional future traffic.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact

Bold, boxed and greyed indicates a significant contribution to a cumulative impact



Table 12 (Continued)

2035 Proposed GP Intersection Impact Summary – Compared to Existing Conditions

				2035 Proposed GP compared to Existing Conditions												
						Incr.										
				Avg.		In Crit.	Incr.	Threshold								
			Peak	Delay		Delay	In Crit.	for Sig.	Percent Contribution ¹							
#	Intersection	CMP	Hour	(sec)	LOS	(sec)	V/C	Contribution	LUTE	PPSP	LSAP	Regional				
59	SR 85 NB & Fremont Ave		AM	60.6	Е	43.4	0.306	90%	75%	8%	5%	12%				
			PM	32.5	C-	8.7	0.266									
60	SR 85 SB & Fremont Ave		AM	87.6	F	71.5	0.236	40%	59%	15%	4%	22%				
			PM	221.4	F	287.2	0.837	20%	70%	4%	2%	24%				
63	Ellis St & Middlefield Rd (MV)		AM	56.4	E+	51.3	0.298	90%	21%	11%	7%	61%				
			PM	45.0	D	32.5	0.518			_						
82	Lawrence Expwy & Cabrillo Ave (SCL)	+	AM	161.8	F	124.4	0.411	1%	17%	10%	28%	45%				
			PM	128.4	F	95.3	0.400	1%	35%	7%	25%	33%				
84	Lawrence Expwy & Benton St (SCL)	+	AM	200.5	F	161.2	0.489	1%	20%	6%	12%	62%				
			PM	168.4	F	217.6	0.455	1%	23%	4%	12%	61%				
85	Lawrence Expwy & Homestead Road (SCL)	*	AM	113.9	F	46.0	0.142	5%	27%	5%	10%	58%				
			PM	144.7	F	135.6	0.651	1%	33%	2%	6%	59%				
86	Lawrence Expwy & Pruneridge Ave (SCL)	+	AM	91.5	F	44.3	0.214	1%	12%	5%	10%	73%				
			PM	85.1	F	72.6	0.629	60%	22%	2%	5%	71%				
90	Lawrence Expwy & I-280 SB (SJ)	*	AM	118.2	F	77.8	0.220	30%	10%	7%	11%	72%				
			PM	59.8	E+	41.5	0.030	80%	18%	3%	6%	73%				
95	Bowers Ave & Central Expwy (SCL)	*	AM	102.5	F	66.5	0.385	70%	42%	11%	13%	34%				
			PM	147.3	F	98.3	0.251	40%	44%	7%	13%	36%				
96	Bowers Ave & Kifer Road (SCL)		AM	29.6	С	7.7	0.210									
			PM	65.2	E	59.2	0.453	90%	35%	5%	6%	54%				
98	Bowers Ave & Monroe St (SCL)		AM	51.1	D-	24.9	0.431									
		_	PM	128.9	F	101.2	0.477	50%	31%	3%	13%	53%				

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

MV indicates that the intersection is within the City of Mountain View.

SCL indicates that the intersection is within the City of Santa Clara.

1. The percent contributions are calculated for all approaches (unweighted) and relate to LSAP, Proposed LUTE, PPSP Project Trips and regional future traffic.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact

Bold, boxed and greyed indicates a significant contribution to a cumulative impact



City of Sunnyvale Land Use and Transportation Element Update TIA





LUTE Intersection Impacts

Based on the methodology for determining LUTE intersection impacts, the LUTE would generate a significant intersection impact at the following study intersections:

- Lawrence Expressway & Tasman Drive (#11) PM Peak Hour
- Lawrence Expressway & Lakehaven Drive (#12) PM Peak Hour
- Lawrence Expressway & Oakmead Parkway (#15) AM & PM Peak Hours
- Duane Avenue/Stewart Drive & Duane Avenue (#19) AM Peak Hour
- Wolfe Road & Fremont Avenue (#29) AM & PM Peak Hours
- Fair Oaks Avenue & Arques Avenue (#31) AM & PM Peak Hours
- Fair Oaks Avenue & El Camino Real (#34) PM Peak Hour
- Sunnyvale-Saratoga Road & Remington Drive (#40) PM Peak Hour
- Mathilda Avenue & El Camino Real (#48) PM Peak Hour
- Mary Avenue & Central Expressway (#52) PM Peak Hour
- Mary Avenue & Fremont Avenue (#55) AM & PM Peak Hours
- SR 85 Southbound & Fremont Avenue (#60) AM & PM Peak Hours
- Lawrence Expressway & Cabrillo Avenue (#82) AM & PM Peak Hours
- Lawrence Expressway & Benton Street (#84) AM & PM Peak Hours
- Lawrence Expressway & Homestead Road (#85) AM & PM Peak Hours
- Lawrence Expressway & Pruneridge Avenue (#86) AM Peak Hour
- Bowers Avenue & Central Expressway (#95) PM Peak Hour

Potential mitigation strategies are discussed below.

CEQA Analysis - Potential Mitigation Strategies for LUTE Impacts

Improvement options were studied for each intersection experiencing LUTE intersection impacts under the 2035 proposed GP conditions when compared to existing conditions. A significant LUTE intersection impact can be satisfactorily mitigated by either reducing the LUTE contribution to the traffic increases below the threshold for a significant contribution, or by implementing measures that would restore intersection conditions to an average delay that eliminates the cumulative intersection impact.

First presented below is a discussion of potential mitigation measures to eliminate the LUTE intersection impacts through mitigating the cumulative intersection impacts. Then discussed is the effect of a potential transportation demand management (TDM) program in eliminating the LUTE intersection impacts by reducing the LUTE contribution to traffic increases.

The LOS results under the Mitigated 2035 Proposed GP conditions when compared to existing conditions are summarized in Table 13.



Table 13

2035 Proposed GP Intersection Impact Mitigation Summary – Compared to Existing Conditions

				Exist	ing	<u>20</u> 35 P	Propos	<u>ed</u> GP	<u>co</u> mpa	red to Exis	ting C	onditions
							Incr.			Mi	tigate	d
				Avg.		Avg.	Ir	n Crit.	Incr.	Avg.		
			Peak	Delay		Delay		Delay	In Crit.	Delay		
#	Intersection	СМР	Hour	(sec)	LOS	(sec)	LOS ((sec)	V/C	(sec)		LOS
11	Lawrence Expwy & Tasman Dr	*	AM	40.2	D	92.7	F 1	133.9	0.190		211	
			PM	64.8	Ē	117.6	F	70.7	0.456		SU	
12	Lawrence Expwy & Lakehaven Dr	+	AM	59.6	E+	84.9	F :	20.8	0.335		911	
			PM	63.5	Е	164.8	F 1	144.0	0.444		50	
15	Lawrence Expwy & Oakmead Pkwy	+	AM	48.7	D	150.6	F 1	142.3	0.418		SU	
			PM	57.5	E+	147.8	F 1	127.5	0.292			_
19	Duane/Stewart & Duane Ave		AM	31.4	С	113.3	F 1	120.3	0.396	33.3		C-
			PM	30.6	С	32.6	C-	1.7	0.175	33.0		C-
29	Wolfe Rd & Fremont Ave		AM	48.9	D	63.0	E	12.4	0.270	51.0		D-
0.1			PM	49.8	D	105.8	F 1	104.7	0.471	53.0		D-
31	Fair Oaks Ave & Arques Ave		AM	29.7	C	101.1	F 1	26.3	0.751		SU	
24		*	PIVI	34.4	C-	97.5		40.6	0.431			
34	Fair Oaks Ave & El Camino Real			34.9	С- П	47.0	1	10.0	0.294		SU	
40	Supporte Seratoga Pd & Pomington Dr	*		42.2	Л	58.8	F 1	23.6	0.213			
-10	Sullingvale-Salatoga Nu & Nennington Di		PM	45.8	D	105.4	F1	101.2	0.395		SU	
48	Mathilda Ave & El Camino Real	*	AM	44.0	D	76.0	E- 4	49.3	0.299			
			PM	48.4	D	104.0		91.9	0.398		SU	
52	Marv Ave & Central Expwy	*	AM	50.0	D	86.3	F	51.1	0.552		011	
			PM	61.6	Е	149.9	F 1	150.5	0.293		50	
55	Mary Ave & Fremont Ave		AM	41.8	D	129.8	F 1	134.9	0.626		011	
	,		PM	42.0	D	151.5	F 1	173.9	0.747		50	
60	SR 85 SB & Fremont Ave		AM	37.5	D+	87.6	F	71.5	0.236		SI 1	
			PM	31.6	С	221.4	F 2	287.2	0.837		30	
82	Lawrence Expwy & Cabrillo Ave (SCL)	+	AM	75.9	E-	161.8	F 1	124.4	0.411		SII	
			PM	60.2	Е	128.4	F	95.3	0.400		00	
84	Lawrence Expwy & Benton St (SCL)	+	AM	81.0	F	200.5	F 1	161.2	0.489		SU	
			PM	55.5	E+	168.4	F 2	217.6	0.455			
85	Lawrence Expwy & Homestead Road (SCL)	*	AM	84.5	F	113.9	<u> </u>	46.0	0.142		SU	
			PM	80.3	F	144.7	<u>F 1</u>	135.6	0.651			
86	Lawrence Expwy & Pruneridge Ave (SCL)	+	AM	67.3	E	91.5	F 4	44.3	0.214		SU	
05		*	PIVI	36.6	D+	85.1	F	12.6	0.629			
95	Bowers Ave & Central Expwy (SCL)			63.4	E	102.5	F	00.5	0.385		SU	
			PIVI	63.0	E	147.3	F 3	98.3	0.251			

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

SCL indicates that the intersection is within the City of Santa Clara.

SU indicates the intersection has no feasible mitigation and has a significant and unavoidable impact.

BOLD indicates a substandard level of service

BOLD and boxed indicates a significant cumulative impact

Bold, boxed and greyed indicates a significant contribution to a cumulative impact



Lawrence Expressway & Tasman Drive (#11) [CMP]

Under existing conditions, the LOS is an acceptable LOS D and LOS E during the AM and PM peak hours, respectively. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on VTA's CMP criteria.

The LUTE would create a significant intersection impact during the PM peak hour.

Potential At-Grade Mitigation: At this intersection, the August 2015 update of the *County of Santa Clara Expressway Plan 2040* has identified depressing the light rail tracks under the intersection as a Tier 3 project. At the time of this report, there exist no finalized intersection reconfiguration plans. It is assumed that the finalized reconfiguration plans would restore intersection operations to an acceptable LOS E. There exist no other feasible at-grade mitigations.

However, since the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure implementation of any mitigation measure. The timing of implementation as well as availability of funding for the identified mitigation measure are also uncertain. Therefore, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Lakehaven Drive (#12)

Under existing conditions, the LOS is an acceptable LOS E+ and LOS E during the AM and PM peak hours, respectively. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on Sunnyvale's criteria.

The LUTE would create a significant intersection impact during the PM peak hour.

Potential At-Grade Mitigation: At-grade mitigation would require widening the northbound leg to include a total of two left-turn lanes, four through lanes, and one right-turn lane. The southbound leg would need to be widened to two left-turn lanes, five through lanes, and one right-turn lane. The eastbound leg would need to be widened to two left-turn lanes, one shared through-right lane, and one right-turn lane. The westbound leg would require a third left-turn lane. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection because 1) the intersection is not within the City's jurisdiction and the County has no plans for at-grade improvements, 2) the required mitigation would displace homes and businesses, and 3) the required mitigation would lead to secondary pedestrian and bicycle impacts.

Potential Grade-Separation Mitigation: An interchange would eliminate the LUTE impact at this intersection. However, this intersection is within the County of Santa Clara jurisdiction, and the County currently has no plans to construct an interchange at this intersection.

Therefore, the LUTE intersection impact at this intersection would be *significant and unavoidable*.

Lawrence Expressway & Oakmead Parkway (#15)

Under existing conditions, the LOS is an acceptable LOS D and LOS E+ during the AM and PM peak hours, respectively. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on Sunnyvale's criteria.

The LUTE would create a significant intersection impact during both the AM and PM peak hours.



Proposed At-Grade Mitigation: At this intersection, the August 2015 update of the *County of Santa Clara Expressway Plan 2040* has identified a Tier 1 interim project of converting the southbound HOV lane to a mixed-flow lane. This interim project would only partially mitigate the intersection impact. The intersection impact could be further reduced (but not fully mitigated) by restriping the eastbound lane to include three left-turn lanes, one through lane, and one right-turn lane. There exists no feasible at-grade improvement that would fully mitigate the intersection impact.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. Therefore, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Duane Ave/Stewart Dr & Duane Avenue (#19)

Under existing conditions, the LOS is an acceptable LOS C during the AM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during the AM peak hour. Compared to existing conditions, the intersection would have a significant cumulative impact during the AM peak hour based on Sunnyvale's criteria.

The LUTE would create a significant intersection impact during the AM peak hour.

Proposed At-Grade Mitigation: Mitigation would require restriping the westbound leg to one left-turn lane, one shared through-right lane, and one right-turn lane. There would be street widening or modifications to signal phasing. Secondary impacts to pedestrian and bicyclists would also be minimal.

An alternative mitigation measure is to convert the intersection to a 2-lane roundabout. Right-of-way acquisition would be required mostly on the northeast, northwest, and southwest corners. Pedestrian crosswalks would be provided 20-40 feet back from the roundabout. However, there would be no protected pedestrian walk phases.

With implementation of either proposed mitigation measure, the intersection would operate at an acceptable LOS C (LOS A with roundabout) during the AM peak hour. With implementation of the proposed mitigation measure, the LUTE intersection impact at this intersection would be *less than significant*.

Wolfe Road & Fremont Avenue (#29)

Under existing conditions, the LOS is an acceptable LOS D during both the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS E and LOS F during the AM and PM peak hour. Compared to existing conditions, the intersection would have a significant cumulative impact during both peak hours based on Sunnyvale's criteria.

The LUTE would create a significant intersection impact during both peak hours.

Potential Mitigation: Mitigation would require construction of an exclusive southbound right-turn lane for the length of the segment. The northbound leg would also require a second left-turn lane. The eastbound inner left-turn lane would require restricting the U-turn movement to allow for a southbound overlap right-turn phase. Depending on the extent of the median on the north leg that could be removed, the north leg would be widened between 3 to 11 feet. The north leg would be realigned to accommodate the southbound right-turn. There is existing right-of-way on the northeast quadrant of the intersection. The second northbound left-turn lane would need to be the same length as the existing left-turn lane. Right-of-way acquisition would be required from the southwest quadrant. The south leg would need to be realigned. The south leg would be widened by 10 feet.



With the proposed mitigation, the intersection would operate at an acceptable LOS D during both the AM and PM peak hours. Secondary impacts associated with this mitigation on the pedestrian and bicycle facilities would not be significant. The increased exposure time ranges from approximately 1 to 3 seconds for pedestrians and 1 to 2 seconds for bicyclists. This increased exposure time is minimal. The required right-of-way acquisition would not displace businesses. Therefore, with the proposed mitigation measure, the LUTE intersection impact would be *less than significant*.

Fair Oaks Avenue & Arques Avenue (#31)

Under existing conditions, the LOS is an acceptable LOS C and C- during the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both the AM and PM peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on Sunnyvale's criteria.

The LUTE would create a significant intersection impact during both the AM and PM peak hours.

Potential Mitigation: Mitigation would require construction of dedicated right-turn pockets on the southbound, eastbound, and westbound legs. The southbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket would require additional right-of-way acquisition and displacement of business parking. The southbound right-turn pocket would also widen the north crosswalk by approximately 12 feet. The eastbound right-turn pocket would need to be approximately 150 feet long. The existing median on the eastbound leg could be shifted north to accommodate the right-turn pocket within the existing right-of-way. The westbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket could be accommodated through removing the inner east receiving lane for approximately 150 to 200 feet in length. The westbound lanes would all be shifted south by one lane to accommodate the right-turn pocket. Removing the inner eastbound receiving lane would not cause secondary impacts because the other three legs each have only one lane feeding into the eastbound through lane would require re-aligning. Since the westbound right-turn pocket can be accommodated within the existing right-of-way, there would be minimal secondary impacts to pedestrian and bicyclists.

With the proposed mitigation, the intersection would operate at LOS D during both the AM and PM peak hours. The eastbound and westbound right-turn pockets could be accommodated within the existing right-of-way, and would not cause secondary impacts to pedestrians and bicyclists. The southbound right-turn pocket would displace approximately half of the parking spaces for the business at the northwest corner of the intersection. There would also be secondary impacts associated with this right-turn pocket such as increased pedestrian and bicyclist exposure to traffic when crossing the intersection. The increased exposure time ranges from approximately 3 seconds for pedestrians and 2 seconds for bicyclists. This increased exposure time is minimal. It is uncertain whether the City of Sunnyvale would be able to acquire the required right-of-way for the southbound right-turn pocket. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Fair Oaks Avenue & El Camino Real (#34) [CMP]

Under existing conditions, the LOS is an acceptable LOS D during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during the PM peak hour. Compared to existing conditions, the intersection would have a significant cumulative impact during the PM peak hour based on VTA's CMP criteria.

The LUTE would create a significant intersection impact during the PM peak hour.



Potential Mitigation: Mitigation would require construction of a dedicated southbound right-turn pocket, a second eastbound left-turn lane, and a second westbound left-turn lane. The southbound right-turn pocket would need to be approximately 150 feet, ending at the southern end of the bike lane. The bike lane would need to be extended south to the stop-bar. The weaving section for bikes and right-turn vehicles should be maintained at 50 feet. The outer southbound through lane would require widening by approximately 12 feet to accommodate the right-turn pocket. The north crosswalk would not be widened. The second eastbound left-turn lane would need to be the same length as the existing left-turn lane. Right-of-way acquisition would be required for the second eastbound and westbound left-turn lanes. Depending on the extent of the median that could be removed, the east and west legs would both need to be widened between 4 to 11 feet. The east-west through lanes would also require re-alignment. Additional right-of-way acquisition would be required.

With the proposed mitigation, the intersection would operate at an acceptable LOS E during the PM peak hour. The required right-of-way acquisition to accommodate the second eastbound and westbound left-turn lanes would displace business parking and remove trees. It is uncertain whether the required right-of-way can be acquired. The intersection is also controlled by Caltrans, so the City cannot ensure the implementation of the mitigation measure. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Sunnyvale-Saratoga Road & Remington Drive (#40) [CMP]

Under existing conditions, the LOS is an acceptable LOS D during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during the PM peak hour. Compared to existing conditions, the intersection would have a significant cumulative impact during the PM peak hour based on VTA's CMP criteria.

The LUTE would create a significant intersection impact during the PM peak hour.

Potential Mitigation: Mitigation would require a dedicated right turn lane on the southbound leg. The westbound leg would require widening to include a second through lane. The southbound right-turn lane would need to be 200 feet in length, extending north to the beginning of the bike weaving area. The existing bike lane would be striped on the inner side of the right-turn lane. The north crosswalk would require lengthening by 12 feet. Additional right-of-way acquisition would be required. The second westbound through lane would need to be extended to Azure Street so the inner westbound through lane. Remington Drive would require realignment to accommodate the second westbound through lane. The east crosswalk would require lengthening by 12 feet. Additional right-of-way acquisition would be required.

With the proposed mitigation, the intersection would operate at an acceptable LOS E during the PM peak hour. The lengthened north and east crosswalks would increase traffic exposure time for pedestrians by 3 to 4 seconds, and 1 to 2 seconds for bicyclists. Existing bike lanes would be maintained. Secondary impacts to bicyclists and pedestrians would be minimal. The required right-of-way acquisition to accommodate the southbound right-turn lane and the second westbound through lane would displace homes and business parking, and remove trees. It is uncertain whether the required right-of-way can be acquired. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Mathilda Avenue & El Camino Real (#48) [CMP]

Under existing conditions, the LOS is an acceptable LOS D during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during the PM peak hour. Compared to existing conditions, the intersection would have a significant cumulative impact during the PM peak hour based on VTA's CMP criteria.

The LUTE would create a significant intersection impact during the PM peak hour.



Potential Mitigation: Mitigation would require dedicated right-turn lanes on the northbound and eastbound legs. The westbound leg would require a second left-turn lane. The northbound curb lane should be modified to allow right-turn vehicles to get by the northbound through vehicles. The curb lane should be widened for approximately 200 feet, south to the beginning of the existing bike weaving area. The northbound leg can be restriped to accommodate the widened right-turn lane within the existing right-of-way. The eastbound right-turn lane would need to be approximately 500 feet long. The required right-of-way would need to be acquired from the southwest quadrant of the intersection. The second westbound left-turn lane would need to be the same length as the existing westbound left-turn lane. The second left-turn lane can be accommodated within the existing right-of-way through removing most of the landscaped median, as well as restriping and realigning the westbound leg.

With the proposed mitigation, the intersection would operate at an acceptable LOS E during the PM peak hour. Only the west crosswalk would be lengthened. The increased traffic exposure time for pedestrians ranges from 3 to 4 seconds, and 1 to 2 seconds for bicyclists. Existing bike facilities would be maintained at all legs. Secondary impacts to bicyclists and pedestrians would be minimal. The required right-of-way acquisition to accommodate the eastbound right-turn lane would displace businesses. It is uncertain whether the required right-of-way can be acquired. The intersection is controlled by Caltrans, so the City cannot ensure the implementation of the mitigation measures. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Mary Avenue & Central Expressway (52) [CMP]

Under existing conditions, the LOS is an acceptable LOS D and LOS E during the AM and PM peak hours, respectively. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on VTA's CMP criteria.

The LUTE would create a significant intersection impact during the PM peak hour.

Potential At-Grade Mitigation: At this intersection, a third westbound left-turn lane is identified as a Tier 3 project as part of the August 2015 update of the *County of Santa Clara Expressway Plan 2040*. The third westbound left-turn lane can be accommodated within the existing right-of-way. There would be minimal secondary impacts to pedestrian and bicyclists. However, a third westbound left-turn lane would not be enough to mitigate the cumulative impact. No further at-grade improvements are feasible at this intersection. Therefore, as a partial mitigation, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned third westbound left-turn lane at this intersection.

Potential Grade-Separation Mitigation: An interchange would eliminate the LUTE impact at this intersection. However, the County of Santa Clara currently has no plans to construct an interchange at this intersection.

Because there exists no feasible mitigation at this intersection to fully mitigate the intersection impact, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Mary Avenue & Fremont Avenue (#55)

Under existing conditions, the LOS is an acceptable LOS D during both the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both the AM and PM peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on Sunnyvale's criteria.

The LUTE would create a significant intersection impact during both the AM and PM peak hours.



Potential Mitigation: Mitigation would require construction of dedicated right-turn pockets on the northbound, eastbound, and westbound legs. The southbound leg would require widening to include a total of one left-turn lane, one through lane, one shared through-right lane, and one right-turn lane. All of the northbound, eastbound, and westbound right-turn pockets would need to be approximately 100 feet long. The bike lanes on all three legs should be striped on the inner side of the right-turn lane. The southbound right-turn lane would need to be 300 feet long. Additional right-of-way acquisition would be required at all four quadrants of the intersection. All crosswalks would be lengthened by 12 feet.

With the proposed mitigation, the intersection would operate at an acceptable LOS D during both the AM and PM peak hours. At all four crosswalks, the increased traffic exposure time for pedestrians ranges from 3 to 4 seconds, and 1 to 2 seconds for bicyclists. Existing bike facilities would be maintained at all legs. The southbound dual right-turns could create potential safety issues for pedestrians and bicyclists. Secondary impacts to bicyclists would be significant. The required right-of-way acquisition would displace businesses at the southern quadrants, and displace business parking at the northern quadrants. It is uncertain whether the required right-of-way can be acquired. For these reasons, this proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

SR 85 Southbound Ramps & Fremont Avenue (#60)

Under existing conditions, the LOS is an acceptable LOS D+ and C respectively during the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both the AM and PM peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on Sunnyvale's criteria.

The LUTE would create a significant intersection impact during both the AM and PM peak hours.

Potential Mitigation: Mitigation would require widening the SR 85 off-ramp to include a left-turn lane, a shared left-through-right lane, and a right-turn lane. The eastbound leg would require restriping to include a bike box in advance of the stop-line to allow right-turn vehicles to bypass the through vehicles on the curb lane. The off-ramp would need to be widened to the proposed three lanes approximately 370 feet back from the intersection. The length of the north sidewalk would not be lengthened, but the pedestrian refuge island would be removed. The off-ramp would also need to be realigned with the SR 85 southbound on-ramp. Widening the off-ramp could be accommodated within the existing right-of-way. Within the existing right-of-way, the required eastbound right-turn lane could be achieved via providing a bike box east of the stop-line to allow bicyclists to clear the right-turn area. The westbound curb lane is 20 feet under existing conditions. With the bike box, right-turn vehicles would be able to bypass the through vehicles. The existing stop-line for the eastbound leg would need to be moved back by approximately 15 feet. Widening the SR 85 off-ramp and providing the bike box on the eastbound leg would fully mitigate the impact during the AM peak hour. During the PM peak hour, the proposed mitigation measures would only partially mitigate the intersection impact. There exists no other feasible mitigation measure at this intersection.

Because there exists no feasible mitigation at this intersection to fully mitigate the PM peak hour intersection impact, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Cabrillo Avenue (#82) – City of Santa Clara

Under existing conditions, the LOS is an acceptable LOS E during both the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both the AM and PM peak hours. Compared to existing conditions, the intersection would have a significant cumulative impact during both the AM and PM peak hours based on City of Santa Clara criteria.

The LUTE would create a significant intersection impact during both the AM and PM peak hours.

Potential At-Grade Mitigation: At-grade mitigation would require four mixed-flow lanes on Lawrence Expressway in both directions, as well as exclusive right-turn lanes on Cabrillo Avenue in both directions. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.



Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus the project mitigation would be to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible, and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Benton Street (#84) – City of Santa Clara

Under existing conditions, the LOS is an unacceptable LOS F during the AM peak hour. Under the 2035 proposed GP conditions, the intersection operations would remain at an unacceptable LOS F during the AM peak hour. Compared to existing conditions, the increase in both critical-movement delay and V/C ratio during the AM peak hour would meet the City of Santa Clara criteria for significant cumulative intersection impact. During the PM peak hour, the intersection would deteriorate from an acceptable LOS E under existing conditions to an unacceptable LOS F under the 2035 proposed GP conditions. Based on City of Santa Clara intersection impact criteria, the intersection would have a cumulative intersection impact in both the AM and PM peak hours.

The LUTE would create a significant intersection impact during both the AM and PM peak hours.

Potential At-Grade Mitigation: At-grade mitigation would require four mixed-flow lanes on Lawrence Expressway in both directions, a second southbound left-turn lane, exclusive right-turn lanes on Benton Street in both directions, and a second westbound left-turn lane. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Homestead Road (#85)[CMP] – City of Santa Clara

Under existing conditions, the LOS is an unacceptable LOS F during both the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would remain at an unacceptable LOS F during both peak hours. Compared against existing conditions, the increases in both critical-movement delay and V/C ratio during both peak hours meet the VTA's CMP criteria for significant cumulative intersection impact.

The LUTE would create a significant intersection impact during both the AM and PM peak hours.



Proposed At-Grade Mitigation: At-grade mitigation would require widening Lawrence Expressway to five mixed-flow lanes, and Homestead Road to three lanes. The northbound leg would require three left-turn lanes. The southbound leg would require two left-turn lanes. The southbound leg would require two left-turn lanes. The westbound leg would require three left-turn lanes. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Lawrence Expressway & Pruneridge Avenue (#86) – City of Santa Clara

Under existing conditions, the LOS is an acceptable LOS E and LOS D during the AM and PM peak hours, respectively. Under the 2035 proposed GP conditions, the intersection operations during both peak hours would deteriorate to an unacceptable LOS F. Compared to existing conditions, the intersection would have a cumulative intersection impact in both the AM and PM peak hours based on City of Santa Clara impact criteria.

The LUTE would create a significant intersection impact during the AM peak hour.

Proposed At-Grade Mitigation: At-grade mitigation would require widening Lawrence Expressway to four mixed-flow lanes. On Lawrence Expressway, the County of Santa Clara currently has no plans to add capacity. All components of the mitigation would require additional right-of-way acquisition and displacement of homes and businesses. Widening the intersection would also extend the pedestrian and bicycle exposure time to traffic, which could lead to secondary pedestrian and bicycle impacts. Therefore, there exists no feasible at-grade mitigation at this intersection.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus, a future project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. For these reasons, the proposed mitigation is infeasible and the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Bowers Avenue & Central Expressway (#95) [CMP] – City of Santa Clara

Under existing conditions, the LOS is an acceptable LOS E during both peak hours. Under the 2035 proposed GP conditions, the intersection operations during both peak hours would deteriorate to an unacceptable LOS F. Compared to existing conditions, the intersection would have a cumulative intersection impact in both the AM and PM peak hours based on City of Santa Clara impact criteria.

The LUTE would create a significant intersection impact during the PM peak hour.



Proposed At-Grade Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies a Tier 2 project to widen the eastbound leg to include a third left-turn lane. This identified mitigation measure would only partially mitigated the LUTE intersection impact. There exists no other feasible at-grade mitigation measure.

Potential Grade-Separation Mitigation: The August 2015 update of the *County of Santa Clara Expressway Plan 2040* identifies an interchange at this intersection as a Tier 3 project. At the time of this report, the interchange configurations have not been finalized. It is assumed that the final interchange configuration would restore the intersection operations to an acceptable LOS D. With the interchange, the LUTE impact at this intersection would be eliminated. Thus a project consistent with the proposed LUTE would be required to pay its fair share contribution towards the planned interchange.

However, because the intersection is controlled by the County of Santa Clara, the City of Sunnyvale cannot ensure the implementation. The timing of implementation as well as availability of funding of this interchange are also uncertain. Therefore, the LUTE intersection impact at this intersection is considered **significant and unavoidable**.

Transportation Demand Management Program

Transportation Demand Management (TDM) is a combination of services, incentives, facilities, and actions that reduce single-occupant vehicle (SOV) trips to help relieve traffic congestion, parking demand, and air pollution. The purpose of TDM is to promote more efficient utilization of existing transportation facilities, and to ensure that new developments are designed to maximize the potential for sustainable transportation usage.

The *Draft Land Use and Transportation Element* of the proposed Sunnyvale General Plan has outlined the following policies and actions relevant to TDM:

Policy 23 Action 1	Reduce peak hour and total daily single occupant vehicle trips by expanding the use of transportation demand management programs in the City.
Policy 24	Promote modes of travel and actions that provide safe access to City streets and reduce single occupant vehicle trips, and trip lengths locally and regionally. The order of consideration of transportation users shall be: 1) pedestrians, 2) non-automotive (bikes, three-wheeled bikes, scooters, etc.), 3) mass transit vehicles, 4) delivery vehicles, and 5) single-occupant automobiles.
Policy 25	Among motorized vehicles, priority in all services such as carpools shall be given to low emission, zero emission or environmentally friendly vehicles such as carpools in providing parking and planning for lane priority and other operations.
Policy 31 Action1	Pursue opportunities for user fees such as paid parking, paid parking permits at workplaces, and paid parking places for on street parking in residential neighborhoods, and promote corporate parking cash out programs.
Action 2	Manage City provided public parking through pricing and location strategies in order to match supply and demand, shift the market costs to users of vehicle parking, maintain mobility and access to Sunnyvale businesses, and reduce vehicle trips.
Policy 37	Parking is the temporary storage of transportation vehicles and shall not be considered a transport use of public streets.
Policy 78 Action 2	Support transportation demand management programs and other ride sharing programs county-wide.



Sunnyvale typically requires new development to achieve between a 20% and 35% trip reduction depending on the type and location. At the following intersections, a TDM program within this range would be sufficient to mitigate the LUTE intersection impact through reducing the LUTE's traffic increase below the threshold for significant contribution. With a TDM program, the LUTE intersection impact at the following intersections would be *less than significant*. The intersection-specific minimum percent trip reductions required to eliminate the LUTE intersection impacts are listed below.

- Lawrence Expressway & Tasman Drive (#11) 33% trip reduction
- Duane Ave/Stewart Dr & Duane Avenue (#19) 34% trip reduction
- Wolfe Road & Fremont Avenue (#29) 33% trip reduction
- Fair Oaks Avenue & Arques Avenue (#31) 24% trip reduction
- Fair Oaks Avenue & El Camino Real (#34) 30% trip reduction
- Sunnyvale-Saratoga Road & Remington Drive (#40) 20% trip reduction
- Mathilda Avenue & El Camino Real (#48) 17% trip reduction
- Bowers Avenue & Central Expressway (#95) 9% trip reduction

At the nine remaining intersections with a LUTE intersection impact, a TDM program would not be sufficient to mitigate the intersection impacts through reducing the LUTE's contribution below the threshold for significant contribution or reducing the overall intersection volumes to a level that eliminates significant cumulative impacts. The LUTE intersection impact at all nine remaining intersections are considered **significant and unavoidable**.

CEQA Analysis – LUTE Cumulative Freeway Impacts

In analyzing the freeway segments, the STFM was used to project the increase in traffic volumes between existing and the 2035 proposed GP conditions. VTA's CMP guidelines require freeway levels of service to be calculated based on density. However, congested freeway speed (used to measure density) cannot be accurately modeled. For the purpose of this study, freeway levels of service under the 2035 proposed GP conditions are instead calculated based on volume to capacity (V/C) ratio. A freeway segment is assumed to operate at LOS F under the 2035 proposed GP conditions if,

- The freeway segment already operates at LOS F under existing conditions, or
- The STFM forecasts the freeway segment to operate at a V/C ratio above 1 under the 2035 proposed GP conditions.

All Santa Clara County, San Mateo County, and Alameda County guidelines define that a project would cause a freeway impact if it deteriorates freeway levels of service from an acceptable level to an unacceptable level, or if the freeway already operates at an unacceptable level under existing conditions the project would add traffic exceeding 1% (3% in Alameda County) of the capacity. However, because the freeway volume increase between existing and the 2035 proposed GP conditions is caused by a combination of the LSAP, PPSP, the proposed LUTE, and regional traffic, for the purpose of this report, the LUTE would generate a cumulative freeway impact only if the freeway segment is projected to operate at an unacceptable level under the 2035 proposed GP conditions, and the increase in LUTE volume exceeds 1% (3% in Alameda County) of capacity.



Study freeway segments that would operate at LOS F under the 2035 proposed GP conditions are shown on Figures 20 to 23. As shown on Figures 20 and 21, the following mixed-flow segments would operate at LOS F under the 2035 proposed GP conditions:

Santa Clara County

- US 101, northbound from Silver Creek Valley Road to Mathilda Avenue, and from Moffett Boulevard to SR 85 AM Peak Hour
- US 101, northbound from SR 85 to Embarcadero Road AM & PM Peak Hours
- US 101, southbound from Embarcadero Road to Rengstorff Avenue, from Shoreline Boulevard to SR 237, and from Fair Oaks Avenue to Oakland Road PM Peak Hour
- SR 237, westbound from I-880 to First Street AM Peak Hour
- SR 237, westbound from First Street to Great America Parkway AM & PM Peak Hours
- SR 237, westbound from Fair Oaks Avenue to Mathilda Avenue, and from Maude Avenue to SR 85 PM Peak Hour
- SR 237, eastbound from Fair Oaks Avenue to Lawrence Expressway, and from Great America Parkway to First Street AM & PM Peak Hours
- SR 237, eastbound from US 101 to Fair Oaks Avenue, from Lawrence Expressway to Great America Parkway, from First Street to Zanker Road, and from McCarthy Road to I-880 – PM Peak Hour
- SR 85, northbound from Cottle Road to El Camino Real AM Peak Hour
- SR 85, southbound from US 101 to Fremont Avenue, from I-280 to Winchester Boulevard, and from SR 17 to Camden Avenue – PM Peak Hour
- SR 87, northbound from I-280 to US 101 AM Peak Hour
- SR 87, southbound from Skyport Drive to Taylor Street PM Peak Hour
- I-280, northbound from US 101 to SR 17, and from Winchester Boulevard to Foothill Expressway AM Peak Hour
- I-280, northbound from SR 17 to Winchester Boulevard AM & PM Peak Hours
- I-280, southbound from Page Mill Road to Magdalena Avenue, and from SR 85 to 10th Street PM Peak Hour
- I-880, northbound from I-280 to Stevens Creek Boulevard AM Peak Hour
- I-880, northbound from Stevens Creek Boulevard to Bascom Avenue, and from The Alameda to First Street – AM & PM Peak Hours
- I-880, northbound from Bascom Avenue to The Alameda, and from SR 237 to Dixon Landing Road PM Peak Hour
- I-880, southbound from Brokaw Road to Coleman Avenue AM & PM Peak Hours
- I-880, southbound from Montague Expressway to Brokaw Road, and from Coleman Avenue to Stevens Creek Boulevard – PM Peak Hour

San Mateo County

- US 101, between Embarcadero Road and SR 92 AM & PM Peak Hours
- I-280, between Alpine Road and SR 84 AM & PM Peak Hours

Alameda County

- I-880, northbound from Alvarado-Niles Road to Tennyson Road AM & PM Peak Hours
- I-880, northbound from Dixon Landing Road to Mission Boulevard PM Peak Hour
- I-880, southbound from SR 92 to Tennyson Road, from Industrial Boulevard to Whipple Road, and from Alvarado-Niles Road to Stevenson Boulevard – AM Peak Hour
- I-880, southbound from Tennyson Road to Industrial Boulevard, and from Whipple Road to Alvarado-Niles Road – AM & PM Peak Hours
- I-880, southbound from Mission Boulevard to Dixon Landing Road PM Peak Hour



As shown on Figures 22 and 23, the following HOV segments would operate at LOS F under the 2035 proposed GP conditions:

Santa Clara County

- US 101, northbound from Silver Creek Valley Road to Hellyer Avenue, from Capitol Expressway to Mathilda Avenue, from Ellis Street to Moffett Boulevard, and from Rengstorff Avenue to San Antonio Avenue – AM Peak Hour
- US 101, northbound from SR 85 to Rengstorff Avenue, and from San Antonio Avenue to Embarcadero Road – AM & PM Peak Hours
- US 101, southbound from Embarcadero Road to SR 85 AM & PM Peak Hours
- US 101, southbound from Ellis Street to SR 237, from Mathilda Avenue to I-280, and from Story Road to Tully Road – PM Peak Hour
- SR 237, westbound from I-880 to Mathilda Avenue AM Peak Hour
- SR 237, eastbound from Lawrence Expressway to I-880 PM Peak Hour
- SR 85, northbound from Blossom Hill Road to El Camino Real AM Peak Hour
- SR 85, southbound from SR 237 to Homestead Road, from I-280 to De Anza Boulevard, from Saratoga Road to Winchester Boulevard, from SR 17 to Union Avenue, and from Camden Avenue to Almaden Expressway – PM Peak Hour
- SR 87, northbound from Julian Street to US 101 AM Peak Hour
- I-280, northbound from Leigh Avenue to Winchester Boulevard, and from Saratoga Road to Lawrence Expressway – AM Peak Hour
- I-280, southbound from Winchester Boulevard to Leigh Avenue PM Peak hour
- I-880, northbound from SR 237 to Dixon Landing Road AM & PM Peak Hours
- I-880, southbound from Dixon Landing Road to SR 237, and from Brokaw Road to US 101 AM & PM Peak Hours
- I-880, southbound from Montague Expressway to Brokaw Road PM Peak Hour

San Mateo County

• US 101, between Embarcadero Road and Whipple Avenue – AM & PM Peak Hours

Alameda County

- I-880, northbound from Mission Boulevard to Fremont Boulevard (S), from Fremont Boulevard (N) to Alvarado-Niles Road, and from Tennyson Road to SR 92 – AM Peak Hour
- I-880, northbound from Decoto Road to Fremont Boulevard (N), and from Alvarado-Niles Road to Tennyson Road – AM & PM Peak Hours
- I-880, northbound from Dixon Landing Road to Mission Boulevard PM Peak Hour
- I-880, southbound from Stevenson Boulevard to Fremont Boulevard (S) AM Peak Hour
- I-880, southbound from Fremont Boulevard (S) to Mission Boulevard AM & PM Peak Hours
- I-880, southbound from Industrial Parkway to Fremont Boulevard (N) PM Peak Hour



LUTE - Significant Cumulative Freeway Impacts

A select zone analysis within the STFM was performed to estimate the increase in LUTE traffic volume between existing and the 2035 proposed GP conditions. Freeway segments that would experience a significant LUTE cumulative impact are shown on Figures 20 to 23. As shown on Figures 20 and 23, the LUTE would generate a significant cumulative impact on the following mixed-flow segments under the 2035 proposed GP conditions, compared against existing conditions:

Santa Clara County

- US 101, northbound from Tully Road to Mathilda Avenue, and from Moffett Boulevard to SR 85 AM Peak Hour
- US 101, northbound from SR 85 to Embarcadero Road AM & PM Peak Hours
- US 101, southbound from Embarcadero Road to Oregon Expressway, from Shoreline Boulevard to Moffett Boulevard, from Ellis Street to SR 237, and from Fair Oaks Avenue to Oakland Road – PM Peak Hour
- SR 237, westbound from I-880 to First Street AM Peak Hour
- SR 237, westbound from First Street to Great America Parkway AM & PM Peak Hours
- SR 237, westbound from Fair Oaks Avenue to Mathilda Avenue, and from Maude Avenue to SR 85 PM Peak Hour
- SR 237, eastbound from Fair Oaks Avenue to Lawrence Expressway, and from Great America Parkway to First Street AM & PM Peak Hours
- SR 237, eastbound from US 101 to Fair Oaks Avenue, from Lawrence Expressway to Great America Parkway, from First Street to Zanker Road, and from McCarthy Road to I-880 PM Peak Hour
- SR 85, northbound from Almaden Expressway to SR 17, and from Saratoga Road to El Camino Real AM Peak Hour
- SR 85, southbound from US 101 to Fremont Avenue, from I-280 to Winchester Boulevard, and from SR 17 to Camden Avenue – PM Peak Hour
- SR 87, southbound from Skyport Drive to Taylor Street PM Peak Hour
- I-280, northbound from US 101to SR 17, from Winchester Boulevard to De Anza Boulevard, and from SR 85 to Foothill Expressway – AM Peak Hour
- I-280, northbound from SR 17 to Winchester Boulevard AM & PM Peak Hours
- I-280, southbound from Page Mill Road to Magdalena Avenue, and from SR 85 to 10th Street PM Peak Hour
- I-880, northbound from Coleman Avenue to First Street AM & PM Peak Hours
- I-880, northbound from The Alameda to Coleman Avenue, and from SR 237 to Dixon Landing Road PM Peak Hour
- I-880, southbound from Brokaw Road to Old Bayshore Highway, and from US 101 to Stevens Creek Boulevard – PM Peak Hour

San Mateo County

- US 101, northbound from Embarcadero Road to Whipple Avenue AM & PM Peak Hours
- US 101, northbound from Whipple Avenue to Ralston Avenue PM Peak Hour
- US 101, southbound from SR 92 to Marsh Road, and from Willow Road to Embarcadero Road AM Peak Hour
- US 101, southbound from Marsh Road to Willow Road AM & PM Peak Hours
- I-280, between Alpine Road and SR 84 PM Peak Hour

Alameda County

- I-880, southbound from SR 92 to Whipple Road, and from Whipple Road to Stevenson Boulevard AM Peak Hour
- I-880, southbound from Whipple Road to Alvarado-Niles Road AM & PM Peak Hours



As shown on Figures 22 and 23, the LUTE would generate a significant cumulative impact on the following HOV segments under the 2035 proposed GP conditions, compared against existing conditions:

Santa Clara County

- US 101, northbound from Tully Road to Mathilda Avenue, and from Ellis Street to Moffett Boulevard AM Peak Hour
- US 101, northbound from SR 85 to Rengstorff Avenue, and from San Antonio Avenue to Embarcadero Road – PM Peak Hour
- US 101, southbound from Embarcadero Road to San Antonio Road AM Peak Hour
- US 101, southbound from San Antonio Road to SR 85 AM & PM Peak Hours
- US 101, southbound from Mathilda Avenue to I-280, and from Story Road to Tully Road PM Peak Hour
- SR 237, westbound from I-880 to Mathilda Avenue AM Peak Hour
- SR 237, eastbound from Lawrence Expressway to I-880 PM Peak Hour
- SR 85, northbound from Blossom Hill Road to SR 87, and from SR 17 to El Camino Real AM Peak Hour
- SR 85, southbound from SR 237 Homestead Road, and from I-280 to De Anza Boulevard PM Peak Hour
- SR 87, northbound from Julian Street to US 101 AM Peak Hour
- I-280, northbound from Leigh Avenue to Winchester Boulevard, and from Saratoga Road to Lawrence Expressway – AM Peak Hour
- I-280, southbound from Winchester Boulevard to Leigh Avenue PM Peak hour
- I-880, northbound from SR 237 to Dixon Landing Road AM & PM Peak Hours

San Mateo County

- US 101, northbound from Willow Road to Whipple Avenue AM & PM Peak Hours
- US 101, northbound from Embarcadero Road to Willow Road PM Peak Hour
- US 101, southbound from Whipple Avenue to Embarcadero Road AM Peak Hour

Alameda County

- I-880, northbound from Mission Boulevard to Fremont Boulevard (S) AM Peak Hour
- I-880, northbound from Decoto Road to Fremont Boulevard (N) AM & PM Peak Hours
- I-880, northbound from Alvarado-Niles Road to Whipple Road PM Peak Hour
- I-880, southbound from Stevenson Boulevard to Fremont Boulevard (S) AM Peak Hour
- I-880, southbound from Fremont Boulevard (S) to Mission Boulevard AM & PM Peak Hours
- I-880, southbound from Industrial Parkway to Fremont Boulevard (N) PM Peak Hour

The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along SR 237 between N. First Street and SR 85, along US 101 between Cochrane Road and Whipple Avenue, along I-280 between Leland Avenue and Magdalena Avenue, along I-880 between the Alameda County Line and US 101, and along all of SR 87 and SR 85. The Metropolitan Transportation Commission (MTC) plans to convert the existing HOV lanes into express lanes on I-880 between Marina Boulevard and Dixon Landing Road. On all identified freeway segments, the existing HOV lanes are proposed to be converted to express lanes. On US 101 and SR 85 along the identified segments, a second express lane is proposed to be implemented in each direction for a total of two express lanes.

On SR 237, I-280, I-880, and SR 87, the existing HOV lanes would already be operating over capacity under the 2035 proposed GP conditions. Converting the HOV lanes to express lanes would not mitigate the project impact. On US 101 and SR 85, converting the existing HOV lane to an express lane and adding an express lane in each direction would increase the capacity of the freeway and would fully mitigate the freeway impacts. Future projects consistent with the proposed LUTE should make a fair-share contribution toward the cost of the identified express lane program along US 101 and SR 85.

However, capacity improvements on freeways are beyond the capabilities of the City of Sunnyvale. Furthermore, freeways are under Caltrans jurisdiction. Therefore, the freeway impacts would be *significant and unavoidable*.







Figure 20 Proposed GP Freeway Levels of Service - Compared to Existing Conditions - AM Peak Hour









Figure 21 Proposed GP Freeway Levels of Service - Compared to Existing Conditions - PM Peak Hour









Figure 22 Proposed GP Freeway Levels of Service - Compared to Existing Conditions - HOV Lanes - AM Peak Hour









Figure 23 Proposed GP Freeway Levels of Service - Compared to Existing Conditions - HOV Lanes - PM Peak Hour





LUTE Intersection Deficiencies – Compared to Current GP Conditions

The 2035 proposed GP conditions are compared to current GP conditions to determine LUTE deficiencies. This analysis is not required by CEQA, and is for information only.

The methodology for determining LUTE intersection deficiencies and cumulative intersection deficiencies in this section is similar to the methodology for the CEQA analysis (discussed at the beginning of this chapter), except the percent contributions are derived by comparing volumes associated with only the LSAP, the PPSP, and the proposed LUTE between the 2035 proposed GP and the current GP conditions. Between the current GP and the 2035 proposed GP conditions, it is assumed that growth outside of Sunnyvale stays constant.

Intersections with LUTE intersection deficiencies when compared to current GP conditions are shown on Table 14 and graphically shown on Figure 24.

LUTE Intersection Deficiencies

Based on the methodology for determining LUTE intersection deficiencies, the LUTE would result in intersection deficiencies at the following study intersections when compared against the Current GP conditions:

- Lawrence Expressway & Tasman Drive (#11) AM Peak Hour
- Lawrence Expressway & Lakehaven Drive (#12) AM & PM Peak Hours
- Duane Ave/Stewart Dr & Duane Avenue (#19) AM Peak Hour
- Wolfe Road & Fremont Avenue (#29) PM Peak Hour
- Fair Oaks Avenue & Arques Avenue (#31) AM & PM Peak Hours
- Fair Oaks Avenue & El Camino Real (#34) PM Peak Hour
- Sunnyvale-Saratoga Road & Remington Drive (#40) PM Peak Hour
- Mathilda Avenue & El Camino Real (#48) PM Peak Hour
- Hollenbeck Avenue & El Camino Real (#49) PM Peak Hour
- Mary Avenue & Maude Avenue (#51) PM Peak Hour
- Mary Avenue & Central Expressway (#52) PM Peak Hours
- Mary Avenue & El Camino Real (#54) PM Peak Hour
- Mary Avenue & Fremont Avenue (#55) AM & PM Peak Hours
- SR 85 Southbound Ramps & Fremont Avenue (#60) AM & PM Peak Hours
- Lawrence Expressway & Cabrillo Avenue (#82) AM Peak Hour
- Lawrence Expressway & Benton Street (#84) AM & PM Peak Hours
- Lawrence Expressway & Pruneridge Avenue (#86) PM Peak Hour

Fourteen of the intersections with LUTE intersection deficiencies when compared to current GP conditions also have LUTE intersection impacts under the CEQA analysis (when compared to existing conditions). The intersections of Hollenbeck Avenue and El Camino Real, of Mary Avenue and Maude Avenue, and of Mary Avenue and El Camino Real would have LUTE intersection deficiencies when compared to current GP conditions, but would not have LUTE intersection impacts under the CEQA analysis. The intersections of Lawrence Expressway and Oakmead Parkway, of Lawrence Expressway Homestead Road, and of Bowers Avenue and Central Expressway would have LUTE intersection impacts under the CEQA analysis, but not when compared to the current GP conditions.

City of Sunnyvale Land Use and Transportation Element Update TIA





Table 14

2035 Proposed GP Intersection Deficiency Summary – Compared to Current GP Conditions

				2035 Proposed GP compared to Current GP Conditions							
				Incr. Threshold							
			Deele	Avg.		In Crit.	Incr.	for	D		
#	Intersection	CMD	Реак		00	Delay		Considerable	Percer	t Contri	
#	InterSection	CIVIP	Houi	(Sec) L	_03	(Sec)	V/C	Contribution	LUIE	FFSF	LJAP
11	Lawrence Expwy & Tasman Dr	*	AM	92.7	F	89.1	0.093	60%	66%	19%	15%
			PM	117.6	F	-40.4	0.163	80%	73%	15%	12%
12	Lawrence Expwy & Lakehaven Dr	+	AM	84.9	F	18.3	0.263	50%	65%	13%	22%
10	Duana/Stowart & Duana Ava			104.8	F	73	0.038	20%	68%	13%	19%
10	Dualle/Stewart & Dualle Ave		PM	32.6	<u>C-</u>	-1.2	0.003	0070	0070	1070	1070
23	Wolfe Rd & Argues Ave		AM	70.5	E	65.9	0.226	60%	44%	21%	35%
	•		PM	49.8	D	16.4	0.138				
24	Wolfe Rd & Kifer Rd		AM	124.5	F	125.9	0.334	30%	18%	15%	67%
20			PM	113.6	F	-71.2	-0.117	00%	0.00/	220/	4.40/
20	Wolfe Rd & Reed Ave		PM	51.0	<u>E+</u>	15.6	0.052	90%	23%	33%	44%
29	Wolfe Rd & Fremont Ave		AM	63.0	E	2.9	0.023				
			PM	105.8	F	31.9	0.063	10%	82%	6%	12%
31	Fair Oaks Ave & Arques Ave		AM	101.1	F	72.9	0.202	5%	61%	25%	14%
			PM	97.5	F	9.6	0.029	40%	73%	14%	13%
34	Fair Oaks Ave & El Camino Real	*	AM	47.0		7.8	0.066	F 0/	040/	C 0/	400/
40	Suppurelo Sorotogo Ed & Romington Dr	*		1 35.2	F +	5.6	0.155	5%	81%	6%	13%
-0	Sunnyvale-Saratoga Ru & Rennington Di		PM	105.4	F	40.0	0.042	10%	82%	9%	9%
48	Mathilda Ave & El Camino Real	*	AM	76.0	E-	-8.9	-0.022				
			PM	104.0	F	54.9	0.164	20%	83%	12%	5%
49	Hollenbeck Ave & El Camino Real	+	AM	60.2	E	41.5	0.217				
E 1	Manua Asia O Massala Asia		PM	102.7	F	53.1	0.126	40%	82%	14%	4%
51	Mary Ave & Maude Ave		PM	78.6	F-	28 7	0.124	10%	27%	68%	5%
52	Mary Ave & Central Expwy	*	AM	86.3	F	0.6	0.211	1070	2170	0070	070
			PM	149.9	F	-11.6	0.036	20%	42%	38%	20%
54	Mary Ave & El Camino Real	*	AM	56.4	E+	16.3	0.103				
			PM	109.3	F	41.6	0.105	5%	85%	9%	6%
55	Mary Ave & Fremont Ave		AM	129.8	F	56.7	0.139	5% 5%	72%	19%	9% 5%
60	SR 85 SR & Fremont Ave			87.6	F	40.0	0.112	20%	90% 63%	5% 31%	5% 6%
			PM	221.4	F	51.3	0.115	5%	86%	10%	4%
63	Ellis St & Middlefield Rd (MV)		AM	56.4	E+	18.5	0.061	90%	42%	38%	20%
			PM	45.0	D	-52.1	-0.154				
82	Lawrence Expwy & Cabrillo Ave (SCL)	+	AM	161.8	F	26.8	0.067	10%	21%	28%	51%
0.4			PM	128.4	F	7.6	0.010	90%	31%	4%	65%
84	Lawrence Expwy & Benton St (SCL)	+	PM	200.5	F	62.0	0.053	10%	34% 43%	21%	39% 54%
85	Lawrence Expwy & Homestead Road (SCL)	*	AM	113.9	F	-8.1	0.012	70%	47%	22%	31%
			PM	144.7	F	0.6	0.038			,	
86	Lawrence Expwy & Pruneridge Ave (SCL)	+	AM	91.5	F	-30.2	-0.011				
			PM	85.1	F	13.1	0.034	30%	45%	5%	50%
90	Lawrence Expwy & I-280 SB (SJ)	*	AM	118.2	F	-1.0	0.012	70%	22%	41%	37%
1			PIVI	59.0	C.	0.0	0.010				

Notes:

* Denotes CMP intersection (LOS E threshold)

+ Denotes an intersection on a CMP roadway (LOS E threshold)

MV indicates that the intersection is within the City of Mountain View.

SCL indicates that the intersection is within the City of Santa Clara.

1. The percent contributions are calculated for all approaches (unweighted) and relate to LSAP, Proposed LUTE, and PPSP Project Trips. **BOLD** indicates a substandard level of service

BOLD and boxed indicates a cumulative deficiency

Bold, boxed and greyed indicates a considerable contribution to a cumulative deficiency



Potential Improvement Strategies for LUTE Deficiencies – Compared to Current GP Conditions

Improvement options were studied for each intersection experiencing LUTE intersection deficiencies under the 2035 proposed GP conditions when compared to the current GP conditions. An intersection with LUTE deficiency can be improved by either reducing the LUTE contribution to the traffic increases below the threshold for a considerable contribution, or by implementing improvement measures that would restore intersection conditions to an average delay that eliminates the cumulative intersection deficiency.

At ten of the intersections with a LUTE deficiency, the improvement discussion is the same as under the CEQA analysis. These ten intersections are listed below:

- Lawrence Expressway & Tasman Drive (#11)
- Lawrence Expressway & Lakehaven Drive (#12)
- Duane Ave/Stewart Dr & Duane Avenue (#19)
- Fair Oaks Avenue & El Camino Real (#34)
- Sunnyvale-Saratoga Road & Remington Drive (#40)
- Mathilda Avenue & El Camino Real (#48)
- Mary Avenue & Central Expressway (#52)
- Lawrence Expressway & Cabrillo Avenue (#82)
- Lawrence Expressway & Benton Street (#84)
- Lawrence Expressway & Pruneridge Avenue (#86)

Discussed below are potential improvement measures for the remaining seven intersections with a LUTE deficiency. Four of the intersections were also identified with a LUTE intersection impact under the CEQA analysis, but the required improvement when compared to the current GP conditions is less than under the CEQA analysis. The remaining three intersections were not identified with a LUTE intersection impact under the CEQA analysis.

Wolfe Road & Fremont Avenue (#29)

Under current GP conditions, the LOS would be an unacceptable LOS F during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would further deteriorate.

Potential Improvement: Improvement would require construction of an exclusive southbound right-turn lane for the length of the segment. The eastbound inner left-turn lane would require restricting the U-turn movement to allow for a southbound overlap right-turn phase. Depending on the extent of the median on the north leg that could be removed, the north leg would be widened between 3 to 11 feet. The north leg would be realigned to accommodate the southbound right-turn. There is existing right-of-way on the northeast quadrant of the intersection.

With the proposed improvement, the intersection would operate at an unacceptable LOS E during the PM peak hour, but would not cause a deficiency when compared to the current GP conditions. Under the CEQA analysis, a second northbound left-turn lane would also be required to fully mitigate the LUTE intersection impact. The second northbound left-turn lane is not required to eliminate the LUTE intersection deficiency when compared to the current GP. Secondary impacts associated with this mitigation on the pedestrian and bicycle facilities would not be significant. The increased exposure time ranges from approximately 1 to 3 seconds for pedestrians and 1 to 2 seconds for bicyclists. This increased exposure time is minimal. The required right-of-way acquisition would be minimal and would not displace businesses.



Fair Oaks Avenue & Arques Avenue (#31)

Under current GP conditions, the LOS would be an unacceptable LOS E+ during the AM peak hour, and an unacceptable LOS F during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during both the AM and PM peak hours.

Potential Improvement: Improvement would require construction of dedicated right-turn pockets on the southbound and westbound legs. The southbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket would require additional right-of-way acquisition and displacement of business parking. The southbound right-turn pocket would also widen the north crosswalk by approximately 12 feet. The westbound right-turn pocket would need to be approximately 150 feet long. This right-turn pocket could be accommodated through removing the inner east receiving lane for approximately 150 to 200 feet in length. The westbound lanes would all be shifted south by lane to accommodate the right-turn pocket. Removing the inner east receiving lane would not cause secondary impacts because all other three legs only have one lane feeding into the east receiving lanes. The eastbound through lane would require re-aligning. Since the westbound right-turn pocket can be accommodated within the existing right-of-way, there would be minimal secondary impacts to pedestrians and bicyclists.

With the proposed improvement, the intersection would operate at an unacceptable LOS E during both the AM and PM peak hours, but would not cause a deficiency when compared to the current GP conditions. The eastbound right-turn pocket, which would be required as an improvement under the CEQA analysis, is not needed to eliminate the LUTE deficiency when compared to the current GP conditions. The westbound right-turn pocket could be accommodated within the existing right-of-way, and would not cause secondary deficiencies to pedestrians and bicyclists. The southbound right-turn pocket would displace approximately half of the parking spaces for the business at the northwest corner of the intersection. The increased exposure time to traffic ranges from approximately 3 seconds for pedestrians and 2 seconds for bicyclists, which is minimal. It is uncertain whether the City of Sunnyvale would be able to acquire the required right-of-way for the southbound right-turn pocket.

Hollenbeck Avenue & El Camino Real (#49) [CMP]

Under current GP conditions, the LOS would be an acceptable LOS E during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during the PM peak hour.

Potential Improvement: Improvement would require restriping the southbound leg to include two leftturn lanes, one through lane, and one shared through-right lane. Hollenbeck Avenue would require realignment for the through lanes. No additional right-of-way acquisition would be required.

With the proposed improvement, the intersection would operate at an acceptable LOS E during the PM peak hour. The existing pedestrian and bicycle facilities would be maintained. However, the intersection is controlled by Caltrans, so the City cannot ensure the implementation of the improvement measures.

Mary Avenue & Maude Avenue (#51)

Under current GP conditions, the LOS would be an unacceptable LOS E+ during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS E- during the PM peak hour.

Potential Improvement: Improvement would require construction of dedicated right-turn lanes on the southbound and eastbound legs. The southbound right-turn lane would need to be approximately 100 feet long. The eastbound right-turn lane would need to be approximately 300 feet long. Both right-turn lanes would need to be constructed on the right side of the bike lanes to minimize weaving with bicyclists. The west leg has a wide neck and the crosswalk would not require widening to accommodate the eastbound right-turn lane. The north crosswalk would require widening by approximately 12 feet to accommodate the southbound right-turn lane. Additional right-of-way acquisition would be required.



With the proposed improvement, the intersection would operate at an acceptable LOS D during the PM peak hour. Secondary deficiencies to bicyclists could be minimized if the weaving section between the right-turn vehicles and bicyclists were maintained at the existing length. Secondary deficiencies to pedestrians would include increased pedestrian exposure time to traffic of approximately 4 seconds on the north crosswalk. The required right-of-way acquisition would not displace business or parking spaces, but would require the removal of three trees as well as removing most of the landscaping buffer for the detached sidewalk on the west leg, which would be in conflict with the PPSP planned street framework on Maude Avenue.

Mary Avenue & El Camino Real (#54) [CMP]

Under current GP conditions, the LOS would be an acceptable LOS E- during the PM peak hour. Under the 2035 proposed GP conditions, the intersection operations would deteriorate to an unacceptable LOS F during the PM peak hour.

Potential Improvement: Improvement would require construction of dedicated right-turn lanes on the southbound and eastbound legs. The southbound right-turn lane would need to be approximately 200 feet long. The north leg would need to be widened by 10 feet to accommodate the right-turn lane. The eastbound right-turn lane would need to be approximately 350 feet long. The west leg would need to be widened by 5 feet to accommodate the right-turn lane. The north and west legs both have wide necks, so the crosswalks would not require widening. Additional right-of-way acquisition would be required.

With the proposed improvement, the intersection would operate at an acceptable LOS E during the PM peak hour. Secondary deficiencies to bicyclists would be minimal. The proposed right-turn lanes would remove all of the landscape buffers between the business parking spaces and the sidewalk. Business parking spaces may need to be displaced to maintain the existing sidewalk buffer zone. Moreover, the intersection is controlled by Caltrans, so the City cannot ensure the implementation of the improvements

Mary Avenue & Fremont Avenue (#55)

Under current GP conditions, the LOS would be an unacceptable LOS F during both the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would further deteriorate.

Potential Improvement: Improvement would require construction of a second southbound left-turn lane. Both left-turn lanes would need to be 350 feet long. The north leg crosswalk would need to be widened by 12 feet. Additional right-of-way acquisition would be required.

With the proposed improvement, the intersection would operate at LOS E during the AM peak hour, and LOS F during the PM peak hour, but would not cause a deficiency when compared to the current GP conditions. Under the CEQA analysis, the intersection also required dedicated right-turn lanes on all legs. These improvements are not required to eliminate the LUTE intersection deficiency when compared against the current GP conditions. Pedestrian and bicyclist exposure time to traffic while crossing the north leg would be increased by 3 to 4 seconds. This secondary impact would be minimal. However, the required right-of-way acquisition would displace business parking spaces and remove trees. It is uncertain whether the City can acquire the required right-of-way.

SR 85 Southbound Ramps & Fremont Avenue (#60)

Under current GP conditions, the LOS would be an unacceptable LOS E- and LOS F respectively during the AM and PM peak hours. Under the 2035 proposed GP conditions, the intersection operations would further deteriorate.

Potential Improvement: Improvement would require widening the SR 85 off-ramp to include a left-turn lane, a shared left-through-right lane, and a right-turn lane. The off-ramp would need to be widened to the proposed three lanes approximately 370 feet back from the intersection. The length of the north sidewalk would not be lengthened, but the pedestrian refuge island would be removed. The off-ramp would also need to be realigned with the SR 85 southbound on-ramp. Widening the off-ramp could be accommodated within the existing right-of-way.

With the proposed improvement, the intersection would operate at LOS E during the AM peak hour and LOS F during the PM peak hour. Under the CEQA analysis, the intersection also required a bike box on the eastbound



leg. This improvement is not required to eliminate the LUTE intersection deficiency when compared to the current GP conditions. Widening the SR 85 off-ramp would not require additional acquisition of right-of-way, and would have minimal deficiencies to pedestrians and bicyclists. However, the SR 85 southbound ramp is not within City jurisdiction, so the City cannot ensure the implementation of any improvement measures.

LUTE Cumulative Freeway Traffic – Compared to Current GP Conditions

The methodology used to identify LUTE cumulative freeway added traffic when compared to the current GP conditions assumes the same as the methodology under the CEQA analysis (when compared against existing conditions), except the increase in LUTE traffic volume is estimated between the current GP and the 2035 proposed GP conditions.

Figures 25 to 28 show the freeway segments that would have a LUTE freeway deficiency when compared to current GP conditions. As shown on Figures 25 and 26, the LUTE would cause deficiencies on the following mixed-flow freeway segments compared against the current GP conditions:

Santa Clara County

- US 101, northbound from Tully Road to Story Road, and from I-280 to Mathilda Avenue AM Peak Hour
- US 101, northbound from SR 85 to Embarcadero Road AM & PM Peak Hours
- US 101, southbound from Shoreline Boulevard to Moffett Boulevard, from Ellis Street to SR 237, and from Fair Oaks Avenue to San Tomas Expressway PM Peak Hour
- SR 237, westbound from I-880 to Great America Parkway AM Peak Hour
- SR 237, westbound from Fair Oaks Avenue to Mathilda Avenue, and from Maude Avenue to SR 85 PM Peak Hour
- SR 237, eastbound from Fair Oaks Avenue to Lawrence Expressway, and from Great America Parkway to First Street AM & PM Peak Hours
- SR 237, eastbound from US 101 to Fair Oaks Avenue, from Lawrence Expressway to Great America Parkway, from First Street to Zanker Road, and from McCarthy Road to I-880 PM Peak Hour
- SR 85, northbound from Saratoga Road to El Camino Real AM Peak Hour
- SR 85, southbound from US 101 to Fremont Avenue, and from I-280 to Saratoga Road PM Peak Hour
- I-280, northbound from 10th Street to Meridian Avenue, and from Saratoga Road to De Anza Boulevard AM Peak Hour
- I-280, southbound from Page Mill Road to Magdalena Avenue, and from SR 85 to Wolfe Road PM Peak Hour
- I-880, northbound from Coleman Avenue to First Street PM Peak Hour

San Mateo County

- US 101, northbound from Embarcadero Road to Willow Road AM & PM Peak Hours
- US 101, southbound from Ralston Avenue to Embarcadero Road AM Peak Hour

All freeway mixed-flow segments with a LUTE cumulative deficiency when compared against the current GP conditions are also identified under the CEQA analysis.



As shown on Figures 27 and 28, the LUTE would cause deficiencies on the following HOV segments under the 2035 proposed GP conditions, compared against existing conditions:

Santa Clara County

- US 101, northbound from I-880 to Mathilda Avenue AM Peak Hour
- US 101, northbound from SR 85 to Rengstorff Avenue, and from San Antonio Avenue to Embarcadero Road PM Peak Hour
- US 101, southbound from Embarcadero Road to San Antonio Road AM Peak Hour
- US 101, southbound from San Antonio Road to SR 85 AM & PM Peak Hours
- US 101, southbound from Mathilda Avenue to I-280, and from Story Road to Tully Road PM Peak Hour
- SR 237, westbound from I-880 to Mathilda Avenue AM Peak Hour
- SR 237, eastbound from Lawrence Expressway to I-880 PM Peak Hour
- SR 85, northbound from SR 17 to El Camino Real AM Peak Hour
- SR 85, southbound from SR 237 Homestead Road, and from I-280 to De Anza Boulevard PM Peak Hour
- SR 87, northbound from Julian Street to US 101 AM Peak Hour
- I-280, northbound from I-880 to Winchester Boulevard, and from Saratoga Road to Lawrence Expressway – AM Peak Hour
- I-880, northbound from SR 237 to Dixon Landing Road PM Peak Hour

San Mateo County

- US 101, northbound from Embarcadero Road to Marsh Road PM Peak Hour
- US 101, southbound from Whipple Avenue to Embarcadero Road AM Peak Hour

All freeway HOV segments with a LUTE cumulative freeway deficiency when compared against the current GP conditions are also identified under the CEQA analysis.

The VTA's Valley Transportation Plan (VTP) 2040 identifies freeway express lane projects along SR 237 between N. First Street and SR 85, along US 101 between Cochrane Road and Whipple Avenue, along I-280 between Leland Avenue and Magdalena Avenue, along I-880 between the Alameda County Line and US 101, and along all of SR 87 and SR 85. The Metropolitan Transportation Commission (MTC) plans to convert the existing HOV lanes into express lanes on I-880 between Marina Boulevard and Dixon Landing Road. On all identified freeway segments, the existing HOV lanes are proposed to be converted to express lanes. On US 101 and SR 85 along the identified segments, a second express lane is proposed to be implemented in each direction for a total of two express lanes.

On SR 237, I-280, I-880, and SR 87, the existing HOV lanes would already be operating over capacity under the 2035 proposed GP conditions. Converting the HOV lanes to express lanes would not eliminate the LUTE cumulative freeway deficiency. On US 101 and SR 85, converting the existing HOV lane to an express lane and adding an express lane in each direction would increase the capacity of the freeway and would eliminate the LUTE cumulative freeway deficiency. Future projects consistent with the proposed LUTE should make a fair-share contribution toward the cost of the identified express lane program along US 101 and SR 85.







Figure 25 Proposed GP Freeway Levels of Service - Compared to Current GP Conditions - AM Peak Hour









Figure 26 Proposed GP Freeway Levels of Service - Compared to Current GP Conditions - PM Peak Hour









Figure 27 Proposed GP Freeway Levels of Service - Compared to Current GP Conditions - HOV Lanes - AM Peak Hour








Figure 28 Proposed GP Freeway Levels of Service - Compared to Current GP Conditions - HOV Lanes - PM Peak Hour





2035 Proposed GP Freeway Ramp Capacity Analysis

Under the 2035 proposed GP conditions, the SR 237/Mathilda Avenue and US 101/Mathilda Avenue interchanges are proposed for reconfiguration. These interchange improvements are identified in the Valley Transportation Plan 2040 (project H33). At the time of this report, the proposed configurations at these interchanges are still not finalized. The two interchange improvement alternatives being studied (documented in the *Notice of Preparation of an Environmental Impact Report*, released on August 18, 2015) are different at only the SR 237/Mathilda Avenue interchange (diamond interchange versus diverging diamond interchange). The alternatives would differ from an operational perspective, but would not differ from a demand forecasting perspective. At the US 101/Mathilda Avenue interchange, the interchange would be reconfigured to a partial cloverleaf interchange. The US 101 northbound and southbound off-ramps would be improved to allow full access onto Mathilda Avenue. The existing US 101 northbound off-ramp to southbound Mathilda Avenue would be demolished. This study assumes the configuration proposed under the *Notice of Preparation of an Environmental Impact Report*, released on August 18, 2015 (see Figure 29).

At the interchange of SR 237/Middlefield Road, the SR 237 westbound off-ramp is proposed to be realigned with Ferguson Drive to the west. The existing SR 237 westbound on-ramp would have access restricted to only eastbound Middlefield Road. As part of the same improvement project, a new loop on-ramp is proposed to connect westbound Middlefield Road to westbound SR 237. This interchange improvement is identified in the VTP 2040 (project H32). This interchange reconfiguration is assumed under the 2035 proposed GP conditions.

The 2035 proposed GP conditions freeway ramp volumes were forecasted using the STFM and adjusted based on existing ramp volumes, where applicable. All interchange improvements listed above are assumed completed. Table 15 shows the peak hour ramp volumes.

The ramp analysis showed that under the 2035 proposed GP conditions, all ramps would continue to operate below capacity.





Hexagon

US 101 / Mathilda Avenue Interchange Improvement Concept Plan



Table 15

2035 Proposed GP Ramp Capacity Analysis – Compared to Existing Conditions

				Existing		2035 Proposed GP Conditions					
					Peak			Peak		LUTE	Trips
Interchange	Ramp	Туре	Peak	Capacity ¹	Volume ²	V/C	Capacity	Volume	V/C	Volume	V/C
SR 237/Lawrence Expwy	EB on-ramp from NB Lawrence Expwy	Diagonal	AM	2900	1513	0.52	2900	1538	0.53	78	2.7%
			PM	1800	1206	0.67	1800	1279	0.71	30	1.7%
	WB on-ramp from NB Lawrence Expwy	Loop	AM	1800	228	0.13	1800	301	0.17	73	4.1%
			PM	1800	253	0.14	1800	254	0.14	1	0.1%
	WB on-ramp from SB Lawrence Expwy	Diagonal	AM	2000	245	0.12	2000	245	0.12	0	0.0%
			PM	2000	312	0.16	2000	315	0.16	3	0.2%
	EB on-ramp from SB Lawrence Expwy	Loop	AM	1800	120	0.07	1800	313	0.17	159	8.8%
			PM	1800	733	0.41	1800	905	0.50	64	3.6%
	EB off-ramp to SB Lawrence Expwy	Diagonal	AM	2000	190	0.10	2000	428	0.21	148	7.4%
			PM	2000	252	0.13	2000	392	0.20	59	3.0%
	EB off-ramp to NB Lawrence Expwy	Loop	AM	1800	127	0.07	1800	200	0.11	73	4.1%
			PM	1800	81	0.05	1800	82	0.05	1	0.1%
	WB off-ramp to NB Lawrence Expwy	Diagonal	AM	2000	950	0.48	2000	1231	0.62	186	9.3%
			PM	2000	499	0.25	2000	578	0.29	49	2.5%
	WB off-ramp to SB Lawrence Expwy	Loop	AM	1800	709	0.39	1800	709	0.39	-66	-3.7%
			PM	1800	732	0.41	1800	732	0.41	-49	-2.7%
SR 237/Mathilda Ave	EB off-ramp to Mathilda Ave	Diamond	AM	2000	866	0.43	2000	1308	0.65	371	18.6%
			PM	2000	254	0.13	2000	342	0.17	-1	-0.1%
	EB on-ramp from Mathilda Ave	Diamond	AM	900	864	0.96	900	867	0.96	99	11.0%
			PM	2000	970	0.49	2000	1058	0.53	112	5.6%
	WB off-ramp to Mathilda Ave *	Diamond	AM	2000	1166	0.58	3800	2630	0.69	1018	26.8%
			PM	2000	828	0.41	3800	1886	0.50	791	20.8%
	WB on-ramp from Mathilda Ave	Diamond	AM	2000	155	0.08	2000	195	0.10	53	2.7%
			PM	2000	369	0.18	2000	377	0.19	-56	-2.8%
SR 237/Maude Ave	EB on-ramp from Maude Ave	Diamond	AM	2000	424	0.21	2000	424	0.21	30	1.5%
	·		PM	2000	702	0.35	2000	750	0.38	51	2.6%
	WB off-ramp to Maude Ave	Diamond	AM	2000	1075	0.54	2000	1151	0.58	53	2.7%
			PM	2000	529	0.26	2000	604	0.30	170	8.5%
SR 237/Middlefield Rd	EB off-ramp to Middlefield Rd	Diamond	AM	2000	686	0.34	2000	970	0.49	113	5.7%
	·		PM	2000	376	0.19	2000	436	0.22	44	2.2%
	WB on-ramp from Middlefield Rd	Diamond	AM	2000	282	0.14	2000	96	0.05	-62	-3.1%
			PM	2000	665	0.33	2000	207	0.10	-64	-3.2%
	WB on-ramp from WB Middlefield Rd *	Loop	AM			-	1800	47	0.03	29	1.6%
			PM			-	1800	265	0.15	89	4.9%

Notes:

* indicates that the ramp would either be modified or newly constructed under year 2035.

1. Ramp capacities were obtained from the Highway Capacity Manual 2000, and considered the free-flow speed, the number of lanes on the ramp, and ramp metering.

2. Existing peak hour volumes are obtained through personal communication with Caltrans staff Jordan Chan on August 11, 2015.



Table 15 (Continued) 2035 Proposed GP Ramp Capacity Analysis – Compared to Existing Conditions

					Existing			2035 Proposed GP Conditions				
					Peak			Peak		LUTE 1	Trips	
Interchange	Ramp	Туре	Peak	Capacity ¹	Volume ²	V/C	Capacity	Volume	V/C	Volume	V/C	
US 101/Lawrence Expwy	SB on-ramp from NB Lawrence Expwy	Diagonal	AM	4700	857	0.18	4700	1390	0.30	411	8.7%	
			PM	2500	607	0.24	2500	1468	0.59	572	22.9%	
	NB on-ramp from NB Lawrence Expwy	Loop	AM	1800	599	0.33	1800	789	0.44	-36	-2.0%	
			PM	2700	428	0.16	2700	647	0.24	83	3.1%	
	NB off-ramp to Lawrence Expwy	Diagonal	AM	3800	1188	0.31	3800	2336	0.61	908	23.9%	
			PM	3800	1344	0.35	3800	1748	0.46	187	4.9%	
	NB on-ramp from SB Lawrence Expwy	Diagonal	AM	1800	420	0.23	1800	816	0.45	199	11.1%	
			PM	2900	322	0.11	2900	891	0.31	410	14.1%	
	SB on-ramp from SB Lawrence Expwy	Loop	AM	2700	297	0.11	2700	501	0.19	193	7.1%	
			PM	2700	321	0.12	2700	495	0.18	136	5.0%	
	SB off-ramp to Lawrence Expwy	Diagonal	AM	3800	649	0.17	3800	819	0.22	150	3.9%	
			PM	3800	1347	0.35	3800	1347	0.35	-22	-0.6%	
US 101/Fair Oaks Ave	SB on-ramp from NB Fair Oaks Ave	Diagonal	AM	2900	407	0.14	2900	407	0.14	-71	-2.4%	
			PM	2900	253	0.09	2900	487	0.17	204	7.0%	
	SB off-ramp to NB Fair Oaks Ave	Loop	AM	1800	126	0.07	1800	192	0.11	60	3.3%	
			PM	1800	171	0.10	1800	274	0.15	99	5.5%	
	NB off-ramp to Fair Oaks Ave	Diagonal	AM	2000	739	0.37	2000	1177	0.59	283	14.2%	
			PM	2000	853	0.43	2000	999	0.50	145	7.3%	
	NB on-ramp from Fair Oaks Ave	Diagonal	AM	1800	608	0.34	1800	1004	0.56	199	11.1%	
	CD off many to CD Fair Oaks Are	Disease	PM	2900	402	0.14	2900	971	0.33	410	14.1%	
	SB off-ramp to SB Fair Oaks Ave	Diagonal		2000	240	0.12	2000	093	0.35	283	14.2%	
	SP on romn from SP Eair Oako Avo	Loon		2000	215	0.34	2000	903	0.45	113	0.7% 15.7%	
		LOOP	PM	1800	430	0.12	1800	647	0.36	113	6.3%	
US 101/Mathilda Ave	SB on-ramp from NB Mathilda Ave	Diagonal	AM	2900	554	0.19	2900	653	0.23	31	1.1%	
		•	PM	2900	488	0.17	2900	849	0.29	38	1.3%	
	NB on-ramp from Mathilda Ave	Loop	AM	1800	314	0.17	1800	1068	0.59	171	9.5%	
			PM	2700	247	0.09	2700	981	0.36	311	11.5%	
	NB off-ramp to Mathilda Ave *	Diagonal	AM			-	3800	1410	0.37	-36	-0.9%	
	·	Ū	PM			-	3800	926	0.24	-85	-2.2%	
	SB on-ramp from SB Mathilda Ave	Loop	AM	2700	111	0.04	2700	284	0.11	56	2.1%	
	·	•	PM	1800	1059	0.59	1800	1059	0.59	-57	-3.2%	
	SB off-ramp to Mathilda Ave *	Diagonal	AM	2000	337	0.17	2000	1224	0.61	301	15.1%	
	·	5	PM	2000	442	0.22	2000	1246	0.62	124	6.2%	

Notes:

* indicates that the ramp would either be modified or newly constructed under year 2035.

1. Ramp capacities were obtained from the Highway Capacity Manual 2000, and considered the free-flow speed, the number of lanes on the ramp, and ramp metering.

2. Existing peak hour volumes are obtained through personal communication with Caltrans staff Jordan Chan on August 11, 2015.



Mode Split

Mode split refers to the percentage of trips made by each of the primary modes of transportation: auto, transit, bicycling, and walking. The 2035 travel demand model calculates the mode split based on input factors taken from survey data or other validated sources. For example, the factors for calculating the transit mode share include residential development density, proximity to transit, household income, the cost of using transit versus auto, and travel times for transit versus auto. Table 16 separately presents the total number of daily person-trips within the LUTE study areas made under existing, current GP, and the 2035 proposed GP conditions. The table includes all trips beginning and/or ending within the study areas: trips that begin and end within study areas, trips that begin within and end outside of the study areas, and trips that begin outside of and end within the study areas.

Since mode split is based on person-trips rather than vehicle trips, the auto mode includes both single-occupant vehicle trips and multi-occupant vehicle trips, including carpooling and vanpooling. If, for example, there are three people in a car, the mode split table will show three person-trips made by automobile.

As shown on Table 16, within the LUTE study area, the mode share for automobiles is expected to be reduced from existing (91.4%) to current GP (90.6%) to the 2035 proposed GP conditions (90.1%). Mode share for transit within the LUTE study area would increase from existing (2.2%) to current GP (3.2%) to the 2035 proposed GP conditions (3.6%). Mode share for biking within the LUTE study area would remain relatively constant at 1.2%. Mode share for walking within the study area would also remain relatively constant from existing (5.2%) to current GP (4.9%) to the 2035 proposed GP (5.1%).

Daily Vehicle Miles Traveled

For the purpose of looking at additional characteristics of trip making, daily vehicles miles traveled (VMT) by trip orientation and VMT per capita were analyzed. VMT is a metric that provides an indication of the usage level of the automobile and truck transportation system within the city. A greater number of vehicle miles traveled generally means more noise and more air pollution. Daily vehicle miles traveled refers to daily trips multiplied by the trip distances. Trips were defined as all trips that begin and/or end within the LUTE study area:

- Internal-External: trips that begin within and end outside of the study area
- External-Internal: trips that begin outside of and end within the study area
- Internal-Internal: trips that begin and end within the study area

For the purpose of this study, trips with both trip ends within the study area is counted as one trip, while trips with only one trip end in the study area were counted as half a trip. This is standard practice, because, for trips with an origin or destination outside of the study area, half of the "responsibility" for the trip lies outside the study area for air quality and greenhouse gas (GHG) analyses. Daily VMT data for all existing, current GP, and 2035 proposed GP scenarios were calculated using outputs from the STFM. Table 17 separately provides within the LUTE study area the total VMT, the total number of vehicles generating those vehicle miles, the average trip length, and VMT per capita. VMT per capita is calculated by dividing the total VMT by the sum of population and jobs within each study area. Also provided is the VMT data for the Santa Clara County, as calculated by the STFM

As shown on Table 17, the LUTE study area would generate a greater amount of VMT under the 2035 proposed GP scenario (3,082,098) compared to the existing scenario (2,142,494), which is because of the greater amount of land-use growth. The 2035 average trip lengths (5.14) would be slightly less than existing conditions (5.2). Overall VMT per capita would increase slightly from 10.62 under existing conditions to 12 under the 2035 proposed GP conditions. The slight increase in VMT per capita within the LUTE study area would be due to the increase in external-internal trips.



Table 16Mode Choice Summary

			LUTE	Area					
	Exis	ting	Curre	ent GP	2035 Pro	2035 Proposed GP			
Mode	Sum	% Share	Sum	% Share	Sum	% Share			
Auto	518,424	91.4%	687,779	90.6%	752,492	90.1%			
Transit	12,503	2.2%	24,518	3.2%	29,708	3.6%			
Bike	6,859	1.2%	9,307	1.2%	10,311	1.2%			
Walk	29,546	5.2%	37,171	4.9%	42,243	5.1%			
Total	567,332		758,775		834,754				

Table 17 Daily VMT Summary

	Sar	nta Clara Cou	nty	LUTE Area					
			2035			2035			
	Existing	Current GP	Proposed	Existing	Current GP	Proposed			
Total VMT	31,466,492	38,011,140	38,360,794	2,142,494	2,804,752	3,082,098			
Internal-Internal ¹	20,137,511	24,206,055	24,444,498	167,830	230,753	264,305			
Internal-External ²	4,769,729	6,077,919	5,967,235	968,804	1,113,624	1,148,219			
External-Internal ³	6,559,252	7,727,166	7,949,061	1,005,860	1,460,375	1,669,574			
Total Vehicles	3,537,070	4,320,305	4,363,488	412,168	547,660	599,332			
Internal-Internal	2,697,673	3,315,344	3,350,199	65,869	90,862	102,913			
Internal-External	350,060	446,502	440,588	192,175	221,552	231,117			
External-Internal	489,337	558,459	572,701	154,124	235,246	265,302			
Average Trip Length [Miles]	8.90	8.80	8.79	5.20	5.12	5.14			
Internal-Internal	7.46	7.30	7.30	2.55	2.54	2.57			
Internal-External	13.63	13.61	13.54	5.04	5.03	4.97			
External-Internal	13.40	13.84	13.88	6.53	6.21	6.29			
Total Population	1,829,083	2,278,007	2,301,782	141,985	144,171	163,215			
Total Jobs	976,576	1,226,122	1,240,932	59,845	83,910	93,522			
VMT per Capita	11.22	10.85	10.83	10.62	12.30	12.00			
Internal-Internal	7.18	6.91	6.90	0.83	1.01	1.03			
Internal-External	1.70	1.73	1.68	4.80	4.88	4.47			
External-Internal	2.34	2.21	2.24	4.98	6.40	6.50			

Footnotes:

1 "Internal-External" refers to VMT generated by vehicle trips that start in and end outside the study area

2 "External-Internal" refers to VMT generated by vehicle trips that start outside and end in the study area.

3 "Internal-Internal" refers to VMT generated by vehicle trips that start and end in the study area.



SB 743

To further the state's commitment to the goals of SB 375, AB 32, and AB 1358, Governor Brown signed SB 743 on September 27, 2013. SB 743 requires the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines (Title 14 of the California Code of Regulations sections and following) to provide an alternative to LOS for evaluating transportation impacts. Once the CEQA Guidelines are amended to include those alternative criteria, auto delay will no longer be considered a significant impact under CEQA. Measurements of transportation impacts may include "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated."

Pursuant to SB 743, OPR released a *Draft of Updates to the CEQA Guidelines* in August 2014. OPR's *Draft of Updates* proposes VMT as the replacement metric for LOS in the context of CEQA. While OPR emphasizes that a lead agency has the discretionary authority to establish thresholds of significance, the *Draft of Updates* suggest criteria that indicate when a project may have a significant, or less than significant, transportation impact on the environment. For instance, a project that results in VMTs greater than the regional average for the land use type (e.g. residential, employment, commercial) may indicate a significant impact. Alternatively, a project may have a less than significant impact if it is located within 0.5 mile of an existing major transit stop, or results in a net decrease in VMTs compared to existing conditions.

The public comment period on OPR's *Draft of Updates* ended in November 2014, and on May 1, 2015 OPR released the *Summary of Feedback*. It is anticipated that further revisions to the *Draft of Updates* will be forthcoming prior to adoption of amendments to the CEQA Guidelines. The revised CEQA guidelines are still in draft form and it is anticipated that they will undergo further changes as a result of significant public input. Since OPR has not yet adopted new CEQA Guidelines for the alternative criteria to LOS, the adopted significance criteria for the City of Sunnyvale, City of Mountain View, City of Santa Clara, City of Cupertino, City of San Jose, and VTA's CMP still remain applicable to the proposed project. It is anticipated that the agencies will revisit the adopted significance criteria once new CEQA guidelines are adopted by the State.

The draft LUTE document includes Policy 23 that addresses the shift in CEQA requirements due to SB 743. Policy 23 is listed below:

Policy 23:	Follow California Environmental Quality Act requirements, Congestion Management Program requirements, and additional City requirements when analyzing transportation impacts of proposed projects and assessing the need for offsetting transportation system improvements or limiting transportation demand.
Action 1:	Reduce peak hour and total daily single-occupant vehicle trips by expanding the use of transportation demand management programs in the City.
Action 2:	 As part of a future update to the City's Transportation Impact Assessment Guidelines, establish and monitor development based transportation goals and indicators for the following: Vehicle miles traveled in the City per service population (population + jobs)
Action 3:	As part of a future update to the City's Transportation Impact Assessment Guidelines, consider establishing additional development-based transportation goals and indicators for the following:
	Vehicle trips
	 Service population within walking distance to bicycle facilities and transit stations
	 Service population within walking distance to daily destinations for services, amenities, and entertainment



LUTE Cumulative Impacts to Transit Facilities

Impacts to Transit Travel Times

Traffic from the LUTE buildout under the 2035 proposed GP conditions would have a significant impact at seventeen intersections when compared to existing conditions. Currently, all but the SR 85 SB ramps and Fremont Avenue intersection are on one or more bus routes. The intersection delays at sixteen impacted intersections would significantly impact transit travel times. As discussed above, there exist feasible mitigations at only the intersections of Duane Ave/Stewart Dr and Duane Avenue, and of Wolfe Road and Fremont Avenue. A TDM program with a 20% to 35% trip reduction target would eliminate the intersection impacts at six more intersections. With the proposed mitigation measures, the LUTE cumulative impact to transit travel times at these eight intersections would be *less than significant.* For the remaining eight impacted intersections, the LUTE cumulative impact to transit travel times would be **significant and unavoidable**.

Impacts to Transit Facilities

Existing transit lines provide services in the City of Sunnyvale mainly with a 30- to 60-minute headway during the AM and PM peak hours. In conjunction with the TDM policies (with a trip reduction target of 20-35%), it is expected that the LUTE would increase transit demand that may not be accommodated by the existing transit services. It is recommended that the City work with VTA to increase transit services within the City of Sunnyvale.

The draft LUTE document identifies various policies and actions to improve the transit network within the City of Sunnyvale. The relevant policies are listed below:

Policy 46 Action 2	Advocate expansion and enhancement to bus, light rail, commuter rail and shuttle
	services within Sunnyvale, consistent with adopted service level standards and
	incorporating a certainty of ongoing investment.

- Action 4 Work in coordination with the Santa Clara Valley Transportation Authority (VTA) to ensure that the City creates streets that are transit-friendly, including bus signal preemption, adequate street and transit stop furniture, and appropriate lighting for nighttime riders.
- Policy 48: Support regional and cross-regional transportation improvements and corridors while minimizing impacts to community form and intracity travel.
 - Action 1 Continue to improve north/south transit routes and facilities that connect to areas in Sunnyvale and through destinations such as transit stations, jobs centers, mixed-use areas, and retail/entertainment centers.
 - Action 2 Continue to support First-Last-Mile transit, bicycle, and pedestrian improvements that connect to regional-serving transit.
 - Action 3 Explore public and private opportunities to provide transportation and Complete Street improvements near regional-serving transit.

It is expected that the LUTE would increase the number of Caltrain riders. Caltrain has plans to increase the number of trains serving the Sunnyvale Caltrain Station from the existing 62 trains per day to 84 trains per day during weekdays, and increase service at Lawrence Station from the existing 56 trains per day to 66 trains per day during weekdays. It is assumed that the planned increase in service will be sufficient to meet the demand.

With the implementation of these policies, the LUTE impact to transit facilities would be less than significant.



LUTE Cumulative Impacts to Pedestrian and Bicycle Facilities

The draft LUTE document identifies various policies and plans to improve pedestrian and bicycle facilities within the City of Sunnyvale. The relevant policies are listed below:

Policy 40	Action 2	Evaluate bicycle and pedestrian retrofit projects based on the merits of each project in the context of engineering and planning criteria.
	Action 4	Implement road diet as a means of adding or enhancing bicycle and pedestrian facilities, increasing traffic safety, and enhancing street character.
Policy 41	Action 1	Provide clear, safe, and convenient links between all modes of travel, including access to transit stations/stops and connections between work, home, commercial sites and public/quasi-public uses.
Policy 44		Support proliferation of multi-use trails within Sunnyvale, and their connection to regional trails, in order to provide enhanced access to open space, to promote alternative transportation options, and to increase recreational opportunities, while balancing those needs with preservation of natural habitat, public safety, and quality of life in residential neighborhoods.
Policy 69	Action 1	Develop complete streets principles to accommodate all users including pedestrians, bicyclists, skaters, and wheelchairs along with motor vehicles in transportation corridors.
	Action 2	Enhance connectivity by removing barriers and improving travel time between streets, trails, transit stops and other pedestrian thoroughfares.
	Action 3	Support traffic calming to slow down vehicles in order to promote safety for non-motorists.
	Action 4	Promote separation of streets and sidewalks with planter strips and widened sidewalks, especially on streets with no parking lane.
	Action 5	Install and connect sidewalks and install safe crosswalks in industrial and office areas.
	Action 6	Maintain and implement a citywide bicycle plan that supports bicycling through planning, engineering, education, encouragement, and enforcement.
	Action 7	Support streetscape standards for vegetation, trees, and art installations to enhance the aesthetics of walking and biking.

The implementation of these policies would close existing sidewalk gaps, build new pedestrian connections, enhance pedestrian intersection crossings, and enhance pedestrian comfort level on sidewalks. Connectivity and safety for the bicycle network would also be improved. Therefore, the LUTE cumulative impact on pedestrian and bicycle facilities would be *less than significant*.



City of Sunnyvale Land Use and Transportation Element Update TIA Technical Appendices

Appendix A

Intersection Counts

Appendix B

Intersection Level of Service Calculations

APPENDIX D – NOISE DATA

































TRAFFIC NOISE LEVELS

Project Number: 1A

Project Name: Sunnyvale LUTE

Background Information

Model Description:	FHWA Highway Noise	Prediction M	lodel (FHV	VA-RD-77	-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s):	Existing				
Source of Traffic Volumes:	Hexagon				
Community Noise Descriptor:	L	dn: X	CNEL:		
Assumed 24-Hour Traffic Distribution:		Day	Evening	Night	
Total ADT Volumes		77.70%	12.70%	9.60%	
Medium-Duty Trucks		87.43%	5.05%	7.52%	

89.10% 2.84%

Traffic Noise Levels

Heavy-Duty Trucks

				Peak		Design	Dist. from		Barrier	Vehic	le Mix	Peak Hou	24-Hour
Analysis Condition Roadway Segment	landlise	Lanes	Median Width	Hour Volume	ADT Volume	Speed	Center to Receptor	Alpha Factor	Attn. dB(A)	Medium Trucks	Heavy Trucks	dB(A)	dB(A)
		Earles	Width	Volume	Volume	(mpn)		1 40101	GB(71)	TTUOKO	THUCKO	-eq	Lan
US 101													
Mathilda Ave to Fair Oaks Ave	R, C, W	8	0	15,004	120,032	60	125	0	0	1.8%	0.7%	79.6	77.4
State Route 237													
Mathilda Ave to Fair Oaks Ave	R, I	6	0	9,379	75,032	60	125	0	0	1.8%	0.7%	77.4	75.2
Interstate 280													
East of SR 85 Interchange	R	10	0	14,336	114,688	60	125	0	0	1.8%	0.7%	79.6	77.4
West of Wolfe Rd Interchange	R	10	0	14,367	114,936	60	125	0	0	1.8%	0.7%	79.6	77.4
State Route 85													
Fremont Ave to Homestead Rd	R, E	6	0	10,785	86,280	60	125	0	0	1.8%	0.7%	78.0	75.8
Arques Avenue													
Lawrence Expressway to Wolfe Rd	C, HS	4	0	1,811	14,488	35	75	0	0	1.8%	0.7%	66.4	64.3
Bernardo Avenue													
El Camino Real to Remington Ave	R,C,E	2	0	593	4,744	35	75	0	0	1.8%	0.7%	61.5	59.4
Evelyn Ave to El Camino Real	R,C, I	2	0	952	7,616	35	75	0	0	1.8%	0.7%	63.5	61.4
Central Expressway													
Just west of Lawrence Expressway	C, I	4	0	4,468	35,744	50	75	0	0	1.8%	0.7%	74.3	72.2
Mary Ave to Mathilda Ave	R, C, O	4	0	4,437	35,496	50	75	0	0	1.8%	0.7%	74.3	72.1
Duane Avenue													
Mathilda Ave to Fair Oaks Ave	R	4	0	693	5,568	35	75	0	0	1.8%	0.7%	62.3	60.2

8.06%

Existing Traffic Noise Levels

El Camino Real													
Southeast of Fair Oaks Ave	С	6	0	2,908	23,240	50	75	0	0	1.8%	0.7%	72.7	70.5
Wolfe Rd to Lawrence Expressway	С	6	0	3,955	31,640	50	75	0	0	1.8%	0.7%	74.0	71.9
Evelyn Ave													
Reed Ave to Wolfe Ave	R	2	0	1,001	8,008	35	75	0	0	1.8%	0.7%	63.8	61.6
Fair Oaks Ave													
Central Expressway to Kifer Rd	R, C	4	0	2,049	16,392	35	75	0	0	1.8%	0.7%	67.0	64.9
Tasman Dr to SR 237	R, C	4	0	1,852	14,816	35	75	0	0	1.8%	0.7%	66.5	64.4
Fremont Avenue													
Bernardo Ave to Mary Ave	R, C	4	0	1,836	14,688	35	75	0	0	1.8%	0.7%	66.5	64.4
Sunnyvale Ave to Wolfe Rd	R, C	4	0	1,873	14,984	35	75	0	0	1.8%	0.7%	66.6	64.5
Hollenbeck Road													
El Camino Real to Remington Ave	R, C	2	0	836	6,688	35	75	0	0	1.8%	0.7%	63.0	60.9
Evelyn Ave to El Camino Real	R, P, IN	2	0	914	7,312	35	75	0	0	1.8%	0.7%	63.4	61.2
Fremont Ave to Homestead Rd	R, E, C	2	0	1,423	11,384	35	75	0	0	1.8%	0.7%	65.3	63.2
Homestead Road													
Wolfe Rd to Lawrence Expressway	R, C, HS	4	0	2,217	17,736	35	75	0	0	1.8%	0.7%	67.3	65.2
Mary Ave to Hollenbeck Rd	R, E, C	4	0	2,570	20,560	35	75	0	0	1.8%	0.7%	68.0	65.8
Java Drive													
Mathilda Ave to SR 237	C, O	4	0	1,328	10,624	35	75	0	0	1.8%	0.7%	65.1	63.0
Kifer Road													
Mathilda Ave to SR 237	O, I	4	0	1,179	9,432	35	75	0	0	1.8%	0.7%	64.6	62.5
Lawrence Expressway													
Reed Ave to El Camino Real	R, C	8	0	4,959	39,672	50	75	0	0	1.8%	0.7%	75.4	73.3
Tasman Dr to SR 237	R, C, I	8	0	3,234	25,872	50	75	0	0	1.8%	0.7%	73.6	71.4
Mary Ave													
El Camino Real to Remington Ave	R, E, C	4	0	1,364	10,912	35	75	0	0	1.8%	0.7%	65.2	63.1
Evelyn Ave to El Camino Real	R, E, C	4	0	2,582	20,656	35	75	0	0	1.8%	0.7%	68.0	65.9
Fremont Ave to Homestead Rd	R, E	4	0	873	6,984	35	75	0	0	1.8%	0.7%	63.3	61.2
Mathilda Ave													
Evelyn Ave to El Camino Real	R, C	6	0	3,409	27,272	35	75	0	0	1.8%	0.7%	69.4	67.3
Java Dr to SR 237	C, I	6	0	2,361	18,888	35	75	0	0	1.8%	0.7%	67.9	65.7
Maude Avenue													
Mary Ave to Mathilda Ave	O, I	4	0	1,919	15,352	35	75	0	0	1.8%	0.7%	66.7	64.6
Reed Avenue													
Lawrence Expressway to Evelyn	R, C	2	0	2,218	17,744	35	75	0	0	1.8%	0.7%	67.2	65.1
Remington Avenue													
Hollenbeck Ave to Sunnyvale Ave	R, C	4	0	1,010	8,080	35	75	0	0	1.8%	0.7%	63.9	61.8
Sunnyvale Avenue													
Fremont Ave to Homestead Rd	R, C	4	0	4,708	37,664	35	75	0	0	1.8%	0.7%	70.6	68.5
El Camino Real to Remington Ave	R, C	4	0	3,319	26,552	35	75	0	0	1.8%	0.7%	69.1	67.0
Evelyn Ave to Reed Ave	R, C	4	0	1,156	9,248	35	75	0	0	1.8%	0.7%	64.5	62.4
Tasman Drive													
Java Dr to Lawrence Expressway	R	4	0	1,291	10,328	35	75	0	0	1.8%	0.7%	65.0	62.9

Existing Traffic Noise Levels

Wolfe Road													
Homestead Rd to Fremont Ave	R, C	4	0	2,406	19,248	35	75	0	0	1.8%	0.7%	67.7	65.6
Arques Ave to Stewart Ave	R, C	4	0	1,577	12,616	35	75	0	0	1.8%	0.7%	65.8	63.7

R = Residential; C = Commercial; I = Industrial; IN = Institutional; P = Parkland; E = Educational; HS = Health Services

¹ Distance is from the centerline of the roadway segment to the receptor location.

TRAFFIC NOISE LEVELS

Project Number: 1B

Project Name: Sunnyvale LUTE

Background Information

Model Description:	FHWA Highway Noi	se Prediction N	/lodel (FHV	VA-RD-77	-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s):	LUTE Buildout				
Source of Traffic Volumes:	Hexagon				
Community Noise Descriptor:		L _{dn} : x	CNEL:		
Assumed 24-Hour Traffic Distribution:		Day	Evening	Night	
Total ADT Volumes		77.70%	12.70%	9.60%	

Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Traffic Noise Levels

			Peak			Design Dist. from		Barrier	Vehicle Mix		Peak Hou 24-Hour		
Analysis Condition Roadway Segment	Land Use	Lanes	Median Width	Hour Volume	ADT Volume	Speed (mph)	Center to Receptor	Alpha Factor	Attn. dB(A)	Medium Trucks	Heavy Trucks	dB(A) L _{ea}	dB(A) Ldn
						,			. ,				
US 101													
Mathilda Ave to Fair Oaks Ave	R, C, W	8	0	16,350	130,800	60	125	0	0	1.8%	0.7%	79.9	77.8
State Route 237													
Mathilda Ave to Fair Oaks Ave	R, I	6	0	13,444	107,552	60	125	0	0	1.8%	0.7%	79.0	76.8
Interstate 280													
East of SR 85 Interchange	R	10	0	15,708	125,664	60	125	0	0	1.8%	0.7%	80.0	77.8
West of Wolfe Rd Interchange	R	10	0	15,624	124,992	60	125	0	0	1.8%	0.7%	79.9	77.8
State Route 85													
Fremont Ave to Homestead Rd	R, E	6	0	12,979	103,832	60	125	0	0	1.8%	0.7%	78.8	76.7
Arques Avenue													
Lawrence Expressway to Wolfe Rd	C, HS	4	0	3,629	29,032	35	75	0	0	1.8%	0.7%	69.5	67.3
Bernardo Avenue													
El Camino Real to Remington Ave	R,C,E	2	0	1,002	8,016	35	75	0	0	1.8%	0.7%	63.8	61.6
Evelyn Ave to El Camino Real	R,C, I	2	0	1,126	9,008	35	75	0	0	1.8%	0.7%	64.3	62.1
Central Expressway													
Just west of Lawrence Expressway	C, I	4	0	7,365	58,920	50	75	0	0	1.8%	0.7%	76.5	74.3
Mary Ave to Mathilda Ave	R, C, O	4	0	6,025	48,200	50	75	0	0	1.8%	0.7%	75.6	73.4
Duane Avenue													
Mathilda Ave to Fair Oaks Ave	R	4	0	752	6,016	35	75	0	0	1.8%	0.7%	62.6	60.5
LUTE Buildout Traffic Noise Levels

El Camino Real													
Southeast of Fair Oaks Ave	С	6	0	5,123	40,984	50	75	0	0	1.8%	0.7%	75.1	73.0
Wolfe Rd to Lawrence Expressway	С	6	0	5,695	45,560	50	75	0	0	1.8%	0.7%	75.6	73.5
Evelyn Ave													
Reed Ave to Wolfe Ave	R	2	0	1,338	10,704	35	75	0	0	1.8%	0.7%	65.0	62.9
Fair Oaks Ave													
Central Expressway to Kifer Rd	R, C	4	0	3,206	25,648	35	75	0	0	1.8%	0.7%	68.9	66.8
Tasman Dr to SR 237	R, C	4	0	2,741	21,928	35	75	0	0	1.8%	0.7%	68.2	66.1
Fremont Avenue													
Bernardo Ave to Mary Ave	R, C	4	0	3,647	29,176	35	75	0	0	1.8%	0.7%	69.5	67.4
Sunnyvale Ave to Wolfe Rd	R, C	4	0	3,330	26,640	35	75	0	0	1.8%	0.7%	69.1	67.0
Hollenbeck Road													
El Camino Real to Remington Ave	R, C	2	0	1,644	13,152	35	75	0	0	1.8%	0.7%	65.9	63.8
Evelyn Ave to El Camino Real	R, P, IN	2	0	2,007	16,056	35	75	0	0	1.8%	0.7%	66.8	64.7
Fremont Ave to Homestead Rd	R, E, C	2	0	1,573	12,584	35	75	0	0	1.8%	0.7%	65.7	63.6
Homestead Road				,	,								
Wolfe Rd to Lawrence Expressway	R, C, HS	4	0	3,552	28,416	35	75	0	0	1.8%	0.7%	69.4	67.2
Mary Ave to Hollenbeck Rd	R, E, C	4	0	3,017	24,136	35	75	0	0	1.8%	0.7%	68.7	66.5
Java Drive				,	,								
Mathilda Ave to SR 237	C, O	4	0	1,882	15,056	35	75	0	0	1.8%	0.7%	66.6	64.5
Kifer Road													
Mathilda Ave to SR 237	O, I	4	0	2,082	16,656	35	75	0	0	1.8%	0.7%	67.1	64.9
Lawrence Expressway	·												
Reed Ave to El Camino Real	R, C	8	0	6,495	51,960	50	75	0	0	1.8%	0.7%	76.6	74.5
Tasman Dr to SR 237	R, C, I	8	0	4,706	37,648	50	75	0	0	1.8%	0.7%	75.2	73.1
Mary Ave				,	,								
El Camino Real to Remington Ave	R, E, C	4	0	2,630	21,040	35	75	0	0	1.8%	0.7%	68.1	65.9
Evelyn Ave to El Camino Real	R, E, C	4	0	3,012	24,096	35	75	0	0	1.8%	0.7%	68.7	66.5
Fremont Ave to Homestead Rd	R.E	4	0	1.514	12.112	35	75	0	0	1.8%	0.7%	65.7	63.5
Mathilda Ave	, _		-	.,	,			•	-				
Evelyn Ave to El Camino Real	R, C	6	0	4,496	35,968	35	75	0	0	1.8%	0.7%	70.6	68.5
Java Dr to SR 237	C, I	6	0	3,475	27,800	35	75	0	0	1.8%	0.7%	69.5	67.4
Maude Avenue	,			,	,								
Mary Ave to Mathilda Ave	O. I	4	0	2.926	23.408	35	75	0	0	1.8%	0.7%	68.5	66.4
Reed Avenue	,			,	,								
Lawrence Expressway to Evelyn	R, C	2	0	3,354	26,832	35	75	0	0	1.8%	0.7%	69.0	66.9
Remington Avenue	,			,	,								
Hollenbeck Ave to Sunnvvale Ave	R. C	4	0	2.512	20.096	35	75	0	0	1.8%	0.7%	67.9	65.7
Sunnvvale Avenue	,			,	,								
Fremont Ave to Homestead Rd	R. C	4	0	5.445	43.560	35	75	0	0	1.8%	0.7%	71.2	69.1
El Camino Real to Remington Ave	R, C	4	0	4,461	35,688	35	75	0	0	1.8%	0.7%	70.4	68.2
Evelvn Ave to Reed Ave	R.C	4	0	1.892	15.136	35	75	0	0	1.8%	0.7%	66.6	64.5
Tasman Drive	, -	-	-	,	-,		-	-	-				
Java Dr to Lawrence Expressway	R	4	0	2,397	19,176	35	75	0	0	1.8%	0.7%	67.7	65.5
1 - 5													

LUTE Buildout Traffic Noise Levels

Wolfe Road													
Homestead Rd to Fremont Ave	R, C	4	0	3,538	28,304	35	75	0	0	1.8%	0.7%	69.4	67.2
Arques Ave to Stewart Ave	R, C	4	0	2,571	20,568	35	75	0	0	1.8%	0.7%	68.0	65.8

R = Residential; C = Commercial; I = Industrial; IN = Institutional; P = Parkland; E = Educational; HS = Health Services

¹ Distance is from the centerline of the roadway segment to the receptor location.

APPENDIX E – WATER SUPPLY ASSESSMENT



California Senate Bill 610

Water Supply Assessment

Sunnyvale General Plan – Land Use and Transportation Element (LUTE)

Prepared for The City of Sunnyvale

by:



November 2015

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City of Sunnyvale Draft LUTE Water Supply Assessment

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ACRONYMS and ABBREVIATIONS

AB	Assembly Bill
ACT	Urban Water Management Planning Act of 1983
AF	Acre Feet
AFY	Acre Feet per Year
AWPF	Advanced Water Purification Facilities
BARDP	Bay Area Regional Desalination Project
BAWSCA	Bay Area Water Supply and Conservation Agency
BMP	Best Management Practices
CA	California
CALFED	California and Federal Bay-Delta Program
CALSIM	California Water Allocation and Reservoir Operations Model
CCF	Hundred Cubic Feet
CEQA	California Environmental Quality Act
	Commercial Industrial and Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Program
CPTP	Coastal Pumping Transfer Program
CRA	Colorado River Aqueduct
	California Urban Water Conservation Council
	California Department of Public Health
CVP	Central Valley Project
	Disinfection Byproducts
	Domand Management Measure
	Demand Management Measure
	Department of Water Peseurces
	Department of Water Resources
	Environmental Impact Penert
	Environmental impact Report
	Environmental Protection Agency
	Environmental Protection Agency
	Evapoli anspiration Concret Plon
GF	College Der Dev
gpu	Callons Per Day
gpi	College Der Minute
gpm	Gallons Per Minute
	Industrial/Onice/Commercial
	Interim Agricultural Water Program
	Integrated Resources Plan
	Integrated Regional Water Management
	Industrial to Residential
	Lond Line and Transportation Floment
	Land Use and Transportation Element
	Lawrence Station Area Plan
	Local Resources Program
MAF	
Max	Maximum
MCL	Maximum Contaminant Level
	Million Gallons per Day
mg/L	
IVIIN	iviinimum Maasaanaa duusaa filla daraataa di
MOU	iviemorandum of Understanding
КP	Regional Plant

RWIP	Recycled Water Implementation Plan
RWQCB	Regional Water Quality Control Board
RWS	Regional Water System
SB	Senate Bill
SCADA	Supervisory Control Data Acquisition System
SCVWD	Santa Clara Valley Water District
SF	Square Feet
SFPUC	San Francisco Public Utilities Commission
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TIN	Total Inorganic Nitrogen
TMDL	Total Maximum Daily Load
USBR	U.S. Bureau of Reclamation
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compounds
WSA	Water Supply Assessment
WSDM	Water Surplus and Drought Management
WTP	Water Treatment Plant
WUMP	Water Utility Master Plan

EXECUTIVE SUMMARY

The City of Sunnyvale consolidated the current General Plan under one cover in July 2011. The consolidation General Plan was assembled from 22 different General Plan elements and subelements, each of which had been developed and adopted at different times. The City is currently reviewing and updating the Land Use and Transportation Element (Chapter 3), which was adopted in 1997, to establish goals and policies that will move the City towards a *Complete Community*.

The City's update of the Land Use and Transportation Element (LUTE), currently in draft status, proposes to increase the land use within the City limits from that which is identified in the current General Plan. Senate Bill 610 (SB 610), requires that a water supply assessment (WSA), based on specific criteria, be prepared to document the sufficiency of available water supply for the City and the proposed project. WSA's are typically prepared for specific development projects. In this particular case, the LUTE update incorporates multiple development projects and growth areas within the City. The WSA identifies water supply and reliability to the City, now and into the future, and makes a determination regarding water supply sufficiency for the Project. **The WSA does not, nor is it intended to, identify infrastructure needs for service distribution for the proposed projects.**

The WSA is considered at a point in time when known future projects are considered. It is also understood that new and innovative programs and projects in concept are yet to be designed. Therefore, WSAs are a part of the ongoing planning efforts of the City to optimize its water resource program.

The WSA includes a discussion of the relevant legislation requiring the WSA, an overview of the proposed Project, analysis of water demands for the City's existing service area and the Project over a 20+ year planning period, and an analysis of reliability of the City's water supplies. This WSA includes discussion of the potential impacts each agency that supplies water to the region has on the City, and concludes with a sufficiency analysis of water supply during normal, single-dry, and multiple dry years over a 20-year planning period.

The purpose of the LUTE is to help move Sunnyvale towards a complete community, which promotes a sustainable place to live that is encouraging to less automobiles. The LUTE objectives are listed below:

- Complete Community
- Regional Planning Coordination
- Neighborhood and Transit-Oriented Place-Making
- Economic Development
- Multi-Modal Transportation
- Health Living
- Attractive Design
- Special and Unique Land Uses
- Diverse Housing Opportunities
- Neighborhood Preservation

The LUTE also outlines the planned and existing projects. Two Projects that will be significantly affected by the upcoming change to the general plan are the Peery Park Specific Plan (PPSP) and Lawrence Station Area Plan (LSAP). PPSP and LSAP are both in the future plan to develop future plans to guide land use and development to create complete communities.

The PPSP area is an approximately 446 net acre study area composed of existing industrial business park and is delineated as a future specific plan. The project area has roughly 7 million square feet (sf) of existing development and about 0.5 million sf construction and a remaining build out, under current zoning, of roughly 9 million sf. The PPSP, as currently recommended, would allow an additional sf increase (over the existing general plan) of 1.3 sf for a total of 9.7 sf within the district at project build out. The purpose of the project is to guide the proposed project in the location, intensity, and design of industrial and commercial buildings to create a cutting-edge workplace district. The PPSP would allow replacement of some of the existing one and two story buildings with maximum four to six story buildings with functional open space and adequate parking.. The PPSP will also include new streetscape and roadway improvements as well as increased bicycle and pedestrian amenities.

Similar to LSAP is a planned project focused on redeveloping an existing area to into a more usable community. Lawrence Station is currently a Caltrain Station that is infrequently used in comparison to the other Caltrain stations. Lawrence Station is part of a large study area to increase circulation and coordination of systems between land uses and cities. Lawrence station total build out will result in approximately 3,500 residential units, 3.6 million square feet of office/R&D development, approximately 217,000 square feet of retail space, and 26,500 square feet of industrial space. These values include all existing residential which will remain and be protected.

Water Supply

As described in the City's 2010 Urban Water Management Plan (UWMP) update, the City of Sunnyvale relies on four sources for its long-term water supply -- City-produced local groundwater from wells, imported water from San Francisco's Regional Water System (SFPUC), imported water from Santa Clara Valley Water District (SCVWD), and recycled water.

- The City of Sunnyvale has groundwater supplied by 6 wells. The groundwater wells are used as a supplemental source to the imported water. Local groundwater from Santa Clara Subbasin supplies about half of the county's water supply during typical years. SCVWD also provides the City with groundwater.
- The City receives water from the City and County of San Francisco's Regional Water System which is operated by SFPUC. This business relationship started in July 2009 and was largely defined by the "Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County" (WSA). The City has an Individual Supply Guarantee of 12.58 MGD (14,100 AFY) and a minimum purchase amount of 8.93 MGD (10,003 AFY).
- The City has a 75 year term contract with Santa Clara Valley Water District (SCVWD) which started in 1976. SCVWD has a contract for 100,000 AFY from the State Water Project and 152,500 AFY from the Central Valley Project (CVP), however typically significantly less than these contractual amounts are able to be delivered.
- In 1991 a wastewater reclamation program was developed to reuse 20% to 30% of the high-quality effluent from the Sunnyvale Water Pollution Plant. This recycled wastewater program serves parks, golf courses, and landscaping needs. The goal of this project is to use the Plant to its full capacity and reuse 10 MGD for treatment of wastewater. The current amount of wastewater that meets recycled water standard is about 811 AFY and the goal in 2035 is about 2,298 AFY.

Water Demand

The City's current estimated average total potable and recycled demand is 21,973 AFY. The City's 2010 UWMP accounted for build-out of the General Plan by year 2030. However the Draft LUTE update is proposing additional development within the City. The Draft LUTE water demand is estimated to add 2,274 AFY to the system by 2035 beyond the existing General Plan and LUTE. Combined with the build-out of the rest of the City, total City water demand is anticipated to increase to 30,701 AFY by 2035 under normal water year conditions (drought years would see reduced water demands as a result of conservation measures).

Demand and Supply Projections

The City of Sunnyvale will meet its future water demands, including the demands for the Project, from existing supply sources as well as sources that are currently being planned, developed and implemented. Future sources include an expanded service area for recycled water and water conservation. Supplies of imported water are expected to remain relatively stable throughout the forecast period. Enhanced water conservation and increased local well production are anticipated to provide for the balance of needed supplies.

Analysis of water demand and supply projections for the City demonstrate that the City has water supply contracts with SFPUC and SCVWD that can satisfy demand through the year 2035 (LUTE build out).

Reliability

Reliability of future water supplies to the region is based on implementation of the regional projects, implementation of local agency programs, and combined efforts and programs among agencies, including all water retailers, and the SFPUC, SCVWD, Regional Water Quality Control Board (RWQCB) and BAWSCA.

Prevailing drought conditions throughout California and the Colorado River Basin, coupled with environmental issues affecting deliveries of SWP and CVP water through the Sacramento – San Joaquin Delta, have resulted in diminished imported surface water supplies throughout California. SFPUC and SCVWD continually re-evaluate their plans and programs for effectiveness in consideration of changing conditions. Their plans describe a progressive series of actions, including tapping into stored water reserves and, if necessary, reductions in deliveries. This WSA demonstrates that possible reductions in imported water deliveries due to drought conditions do not prevent the City from satisfying its anticipated demands.

Conclusion

The information included in this WSA identifies a sufficient program of water supply for the City, now and into the future, including a sufficient water supply for the proposed LUTE changes.

1.0 INTRODUCTION

The City of Sunnyvale consolidated the current General Plan under one cover in July 2011. The consolidation General Plan was assembled from 22 different General Plan elements and subelements, each of which had been developed and adopted at different times. The City is currently reviewing and updating the Land Use and Transportation Element (Chapter 3), which was adopted in 1997, to establish goals and policies that will move the City towards a *Complete Community*.

The overall focus of the Sunnyvale General Plan is to guide the physical development of the City. The Land Use and Transportation Element (LUTE) establishes the fundamental framework of how the City will be laid out (streets and buildings) and how various land uses, developments and transportation facilities will function together. The LUTE and accompanying policies have been developed to help guide the City's land use and transportation decisions for an approximate 25 year horizon – a timeframe that is referred to as *Horizon 2035*. The framework is based on a concept of a *Complete Community* – an attractive, green, sustainable place that is accessible for all residents.

In general, the transportation policies guide how the roadways and streets will function and how space on the roadways will be utilized by multi-modes of transportation with attention to the pedestrian and bicycle network. Both land use and transportation sections include policies that address preserving the qualities of the community that are favorable to the residents and businesses and contribute to the City's unique identity. Policies also provide guidance on the visual quality and character of new development.

The planning area for Sunnyvale includes all the land within the city limits plus a portion of the Moffett Federal Airfield. The land use policies provide direction for how much the city will change and grow and where the growth will take place. The LUTE presents a long-term growth scenario for Sunnyvale that includes additional mixed use residential/commercial growth in key transit-oriented areas and in transformed Village Centers. Areas for additional business (or industrial) growth are also identified. The plan lays out a new path for the City's future that is responsive to the needs of Sunnyvale's diverse population.

The City's update of the LUTE, currently in draft status, proposes to increase the land use within the City limits from that which is identified in the current General Plan. Senate Bill 610 (SB 610), requires that a water supply assessment (WSA), based on specific criteria, be prepared to document the sufficiency of available water supply for the City and the proposed project. WSA's are typically prepared for specific development projects. In this particular case, the draft LUTE incorporates multiple development projects and growth areas within the City. The WSA identifies water supply and reliability to the City, now and into the future, and makes a determination regarding water supply sufficiency for the Project. **The WSA does not, nor is it intended to, identify infrastructure needs for service distribution for the proposed projects.** The proposed location of the changed conditions in the City is shown in **Exhibit 1**.

The specific growth elements contained within the draft LUTE are discussed in more detail in Section 3 of this WSA. For the purposes of this WSA, the proposed total increase in all land use types will be referred to as the "Project." The proposed Project includes an increase of approximately 4,362,600 square feet of industrial/office/commercial building space and the addition of 5,525 residential units over build-out under the existing General Plan and LUTE.

The WSA includes a discussion of the Senate Bill 610 legislation, an overview of the proposed land use changes identified in the draft LUTE, analysis of water demands for the City's existing

service area and the Project and other development projects over a 20-year planning period. The WSA also includes an analysis of reliability of the City's water supplies and water quality, and concludes with an analysis describing water supply during normal, single-dry, and multiple dry years over a 20-year planning period.

1.1 REFERENCES

The following documents were used as reference information in the development of this WSA:

- 1. City of Sunnyvale, 2010 Urban Water Management Plan, June 2011
- 2. City of Sunnyvale, Water Utility Master Plan, November 2010
- 3. Peery Park Specific Plan, Final Initial Study
- 4. Lawrence Station Area Plan, Draft Station Area Plan
- 5. City of Sunnyvale, General Plan, consolidated July 2011
- 6. DRAFT Land Use and Transportation Element (LUTE) Update
- 7. SVWD Drought 2015 Monthly Status Report, August 2015



CHANGING CONDITIONS 2010-2035

sphere

ofInfluence

CHARACTER OF CHANGE

PRESERVE. Area is expected to experience minimal infill and upgrades. Fundamental purpose, form and character stay the same.

ENHANCE. Area is expected to experience minor infill, improvements and redevelopment. Form may change, but will stay consistent with the current character.

TRANSFORM. Area is expected to experience major improvements and redevelopment. Form and character will change significantly through intensification in residential density or nonresidential floor area, and/or change in use



TASMAN

The illustration to the right dentifies the relative amount of change that is expected to occur through 2035. This is a simplified diagram and the boundaries depicted do not coincide with actual property line boundaries.

> Preserve Enhance

Transform - *Residential*

Transform - *Office/Industrial*

Transform - *Mixed*-Use

IN NO. OF A LOCAL DALE AND A LOCAL DALE

MAUDE

CENTRAL EXPRESSWAV

ARQUES

LAWRI

US-101



2.0 LEGISLATION

2.1 SB 610 – Costa – Water Supply Planning

Senate Bill (SB) 610 was implemented January 2002. SB 610 requires a development that qualifies as a "Project" under Water Code 10912 to be supported with a Water Supply Assessment report drafted to specifically identify the public water system that shall supply water to the project and analyze the availability and reliability of water supply to the development. The Water Supply Assessment is to include the following if applicable to the supply conditions:

- 1. Discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses.
- 2. Identification of existing water supply entitlements, water rights, or water service contracts secured by the purveying agency and water received in prior years pursuant to those entitlements, rights, and contracts.
- 3. Description of the quantities of water received in prior years by the public water system under the existing water supply entitlements, water rights or water service contracts.
- 4. Water supply entitlements, water rights or water service contracts shall be demonstrated by supporting documentation such as the following:
 - a. Written contracts or other proof of entitlement to an identified water supply.
 - b. Copies of capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.
 - c. Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.
 - d. Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.
- 5. Identification of other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system.
- 6. If groundwater is included for the supply for a proposed project, the following additional information is required:
 - a. Description of groundwater basin(s) from which the proposed project will be supplied. Adjudicated basins must have a copy of the court order or decree adopted and a description of the amount of groundwater the public water system has the legal right to pump. For non-adjudicated basins, information on whether the DWR has identified the basin as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of DWR that characterizes the condition of the basin, and a detailed description of the efforts being undertaken in the basin to eliminate the long-term overdraft condition.
 - b. Description and analysis of the amount and location of groundwater pumped by the public water system for the past five (5) years from any groundwater basin from which the proposed project will be supplied. Analysis should be based on information that is reasonably available, including, but not limited to, historic use records.
 - c. Description and analysis of the amount and location of groundwater projected to be pumped by the public water system from any groundwater basin from which the

proposed project will be supplied. Analysis should be based on information that is reasonably available, including, but not limited to, historic use records.

- d. Analysis of sufficiency of the groundwater from the basin(s) from which the proposed project will be supplied.
- 7. The water supply assessment shall be included in any environmental document prepared for the project.
- 8. The assessment may include an evaluation of any information included in that environmental document. A determination shall be made whether the projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses.

2.2 SBx7-7 and EO B-29-15

The Water Conservation Act of 2009 (SBx7-7) requires all California urban water agencies to set and meet certain demand reduction targets in order to assist the State in reducing urban water use by 20 percent by 2020. The Act also requires each agency to monitor its progress toward its targets. This was implemented for the purpose of meeting the mandate to reduce per capita urban water consumption by 20 percent statewide. SBx7-7 describes the overall process by which the City of Sunnyvale is to comply with the requirements. It specifically identifies methods for establishing urban water use targets. These requirements and the City of Sunnyvale's specific Compliance Plan are outlined in the 2010 UWMP.

The Governor issued a State of Emergency and Continued State of Emergency in 2014 in response to the persistent state-wide drought. Most recently, Executive Order B-29-15 was issued by the Governor in April 2015 which essentially increases the water use reduction goal to 25 percent as compared to 2013 usage throughout the State. The EO outlines specific water use reduction orders designed to heighten the urgency to reduce water consumption and facilitate the ability of local agencies to implement and enforce water conservation requirements. It addresses facilitating funding for projects designed to increase local water supplies and improve water supply reliability. It also orders more frequent reporting and modifications to the State's Model Water Efficient Landscape Ordinance; mandates Agricultural water suppliers to prepare their Agricultural Water Management Plans by specific dates; and orders the State to coordinate their water conservation related goals with other State departments like Fish and Wildlife, Forestry and Fire Protection, and the Energy Commission.

Additionally, the State Water Resources Control Board on May 5, 2015, adopted regulations implementing Executive Order B-29-15. A copy of this regulation and other related matters are located at the SWRCB's website here:

http://www.swrcb.ca.gov/waterrights/water_issues/programs/drought/emergency_mandatory_regulations.shtml

Under this SWRCB regulation the City of Sunnyvale is required to reduce its total potable water production by 16 percent for each month as compared to the amount used in the same month in 2013.

3.0 GENERAL PLAN – LAND USE AND TRANSPORTATION ELEMENT (LUTE)

3.1 **Project Description**

For the purposes of this WSA, the entire draft Land Use and Transportation Element (LUTE) will be referred to as the "Project." The proposed Project includes changes to several growth areas within the City that were previously identified in the adopted General Plan. These growth areas, and their proposed land use changes, are summarized in Table 3-1. In total, the growth areas will increase the I/O/C square footage by 4,362,600 SF and increase the total number of residential units by 5,525 units within the City limits. The Project land uses are summarized in Table 3-1, and shown in **Exhibit 2**.

Table 3-1

Summary of Land Use Changes

Horizon 2035 LUTE Growth w/2014 BASELINE											
	Adopted	Adopted GP Growth Horizon 2035 Growth Net Change									
	Housing	I/O/C	Housing	I/O/C	Housing	I/O/C					
2014 Existing Condition	57,000	47,300,000	57,000	47,300,000	n/a	n/a					
Growth Areas (2014 to 2035)											
Downtown	1,600	600,000	1,600	600,000	0	0					
Moffett Park	0	7,600,000	0	7,600,000	0	0					
The Woods	0	0	0	308,000	0	308,000					
Peery Park	0	1,550,000	215	3,000,000	215	1,450,000					
ITR Sites	3,770	0	4,000	1,713,000	230	1,713,000					
Neighborhood Villages	0	0	900	-184,000	900	-184,000					
Lawrence Station Area	600	150,000	2,450	1,225,600	1,850	1,075,600					
El Camino Real	1,500	0	4,200	0	2,700	0					
Other Areas	2,100	-1,700,000	1,730	-1,700,000	-370	0					
Total Growth (2014 to 2035)	9,570	8,200,000	15,095	12,562,600	5,525	4,362,600					
Total at Buildout (2035)	66,570	55,500,000	72,095	59,862,600	5,525	4,362,600					

Two of the larger proposed development (or redevelopment) projects included within the LUTE are the PPSP and LSAP. The project description provided in the PPSP Intial Study identified the proposed land uses to include 4-6 story office building and light industrial structures.

The Lawrence Area Station Plan (LASP) Vision Plan describes the area as a "new urban neighborhood in Sunnyvale with a mix of both employment and residential uses at a variety of densities." The residential densities will vary, however it is assumed that a majority of the growth will contain high-density options, located close to Lawrence Station and employment opportunities. The Area Plans are shown on **Exhibit 3**.





3.2 LUTE (Project) Water Demand Projections

The land use changes proposed as a part of the LUTE update will result in increased water demands. Water demands for the land use changes were calculated based on the water duty factors developed and recommended in the City's Water Utility Master Plan (November 2010). Water duty factors in the Water Utility Master Plan (WUMP) were developed for several land use zoning classifications. The Draft LUTE update recommends land use designations that vary slightly from those identified in the WUMP. For the purposes of this report, the land use designations identified in the Draft LUTE update will be utilized for consistency. Table 3-2 summarizes the land use designations and the corresponding water duty factors to be used in the demand calculations.

Table 3-2

Summary of Water Duty Factors

		Water Duty Factor [1]	
WUMP Zoning Classification	Draft LUTE Land Use Designation	(gpd/du)	(gpd/ksf)
Low Density Residential	Low Density Residential (0-7 DU/AC)	310-375	
Low-Med Density Residential	Low Density Residential (7-14 DU/AC)	220-320	
Medium Density Residential	Medium Density Residential (15-24 DU/AC)	170	
High Density Residential	High Density Residential (25-68 DU/AC)	170	
Mobile Home Residential	Mobile Home Residential (0-12 DU/AC)	180	
Commercial	Commercial		270
Industrial	Industrial		130
Moffett Park TOD	Moffett Park Specific Plan (MPSP)		210
Administration - Office	Office		210
Public Facility	Public Facilities		270

[1] Reference: Table 4-5, City of Sunnyvale Water Utility Master Plan

It is noted that the Draft LUTE update includes further land use designations for Mixed-Use areas and specific "Area Plans."

Utilizing the water duty factors from the WUMP, the total project water demand increase was calculated, as shown in Table 3-3. Specific details of the proposed land uses are not yet available, so assumptions were made based on available documents and project descriptions. Unless otherwise noted, residential densities were assumed to be medium and high-densities and non-residential areas were assumed to be commercial (see Table 3-2).

Table 3-3

	Proposed	d Growth ^[1]	Water Duty	Factors ^[2]	Demand Increase					
	Housing	I/O/C	Residential	I/O/C	Resid	Residential I/O/C		′C		
Growth Areas	(du)	(sf)	(gpd/du)	(gpd/ksf)	(gpd)	(AFY)	(gpd)	(AFY)		
Downtown	0	0	n/a	n/a	0	0	0	0		
Moffett Park	0	0	n/a	n/a	0	0	0	0		
The Woods	0	308,000	n/a	270	0	0	83,160	93		
Peery Park	215	1,450,000	170	210	36,550	41	304,500	341		
ITR Sites	230	1,713,000	170	270	39,100	44	462,510	518		
Neighborhood Villages	900	-184,000	170	270	153,000	171	-49,680	-56		
Lawrence Station Area	1,850	1,075,600	170	270	314,500	352	290,412	325		
El Camino Real	2,700	0	170	n/a	459,000	514	0	0		
Other Areas	-370	0	170	n/a	-62,900	-70	0	0		
Total	5,525	4,362,600	n/a	n/a	939,250	1,052	1,090,902	1,222		

Water Demand Increase

[1] Per Table 3-1.

[2] Per Table 3-2.

[3] Demand factors were assigned if specific land use information was available. In cases where specific land use information was not available, conservative factors were assigned.

Based upon the proposed land use changes, the total average increase in water demand is estimated at approximately 2,030,152 gallons per day (gpd) or 2,274 AFY. The demands are assumed to increase linearly over the 20-year planning horizon, with ultimate buildout in year 2035, as shown on Table 3-4. The calculations do not separate recycled water to be used for outdoor landscape irrigation.

Table 3-4

LUTE Water Demand Growth Projection (AFY)

	2015	2020	2025	2030	2035
LUTE Water Demand	0	568	1,137	1,705	2,274

For comparative purposes, the estimated water demand increase per the population projections are included in Section 4.

4.0 CITY OF SUNNYVALE WATER DEMAND AND SUPPLIES

The City of Sunnyvale owns, operates, and maintains a water distribution system that provides retail potable and non-potable water service to a majority of the residents and businesses within the City limits (California Water Service Company provides retail potable water service to pocket areas within the City). The City has an approximate area of 24 square miles.

The City has three sources of potable water supply: purchased surface water from the San Francisco Public Utilities Commission (SFPUC), purchased treated surface water from Santa Clara Valley Water District (SCVWD), and groundwater from seven, City-owned and operated wells. One additional well remains on stand-by for emergencies. An additional source of non-potable water comes from the City's Water Pollution Control Plant in the form of recycled water. The City also has distribution system inter-ties to the cities of Cupertino, Mountain View, and Santa Clara as well as to California Water Service Company through service connections located within city boundaries that are reserved for use in case of an emergency.

The City's potable water distribution system is a closed network consisting of three different pressure zones. Sunnyvale's elevation varies from sea level at the northern end of town to approximately 300 feet above sea level at the southwest corner of town. Zone I extends roughly from El Camino Real northward to the San Francisco Bay and is supplied primarily by SFPUC water. Zone II consists of everything south of Zone I with the exception of the southwest corner of the City and is served by a supply mixture of SFPUC water, City groundwater wells, and SCVWD treated water. Zone III serves the southwest section of town with Hollenbeck Avenue on the east side and Fremont Avenue on the north side and is served by a combination of SCVWD treated water and City well water. The conveyance system extends over 300 miles in length, with pipe diameters ranging from 4 inches to 36 inches.

There are ten potable water storage reservoirs at five different locations throughout the City with a total storage capacity of 27.5 million gallons. There is also one recycled water reservoir with a storage capacity of two million gallons. This volume of water can meet at least one day of average water demand during the summer and up to two days of average water demand during the winter for the entire City.

Refer to **Exhibit 4** for an overview of the City's service area and location of supply connections and sources.

EXHIBIT 4

CITY OF SUNNYVALE 2010 URBAN WATER MANAGEMENT PLAN SECTION 2 – SYSTEM DESCRIPTION PAGE 2-5

Figure 2-1: City of Sunnyvale Service Area Map



4.1 Water Demand

Historical and Present Use

Table 4-1 depicts City of Sunnyvale water production for the years 1993 through 2014. Since 2001, water production has generally been on the decline.

Table 4-1

Historical Water Production (AFY)

Veer	SEDUC	SCUMP	Local	Recycled	Total Water
rear	SFPUC	SCVWD	weils	water	Production
1993	8,690	10,866	3,786	0	23,343
1994	11,451	9,360	2,867	0	23,679
1995	12,552	9,491	1,132	0	23,176
1996	12,216	12,915	616	0	25,747
1997	12,372	13,389	630	0	26,391
1998	11,916	12,378	667	0	24,962
1999	11,058	13,577	713	639	25,987
2000	11,192	12,372	1,649	437	25,649
2001	10,730	12,773	1,189	1,317	26,008
2002	10,096	13,094	1,367	1,296	25,852
2003	11,195	10,773	1,521	1,823	25,311
2004	9,927	11,916	1,395	1,783	25,021
2005	10,868	10,232	1,631	1,851	24,582
2006	10,322	10,524	1,113	1,928	23,887
2007	10,723	9,587	2,696	1,874	24,879
2008	12,675	9,675	1,006	1,576	24,932
2009	11,720	8,176	1,231	1,486	22,613
2010	8,982	9,331	1,629	1,523	21,465
2011	9,930	8,572	467	697	19,665
2012	9,705	10,672	143	0	20,519
2013	11,031	10,417	123	0	21,571
2014	8,454	8,491	2,064	0	19,008

Years 1993-2010, Source: Sunnyvale 2010 UWMP

Years 2011-2014, Source: City of Sunnyvale staff

The City of Sunnyvale categorizes its water accounts into five broad customer categories: singlefamily, multi-family, commercial (incorporating industrial and institutional), irrigation, and fire services. The commercial sector includes all non-residential accounts that are not classified as irrigation. Past and current water use in the City are summarized by classification of the water delivered to all customers in Table 4-2, and by source in Table 4-3.

Table 4-2

Past and Current Potable Water Use by Customer Type (AFY)

Customer Type	2005	2010	2015
Single Family Residential	8,264	7,023	6,555
Multi-Family Residential	6,047	8,309	7,755
Commercial	9,035	4,261	4,507
Irrigation	642	970	905
Other (Firelines)	946	911	850
Total Potable	24,934	21,474	20,573

Source: Sunnyvale 2010 UWMP

Table 4-3

Past and Current Potable Demand by Supply Source

Supply Source	2005	2010	2015	2015 [1]
SFPUC	10,868	8,982	10,003	8,586
SCVWD	10,232	9,331	9,570	7,237
Groundwater Wells	1,631	1,629	1,000	142
Total	24,582	21,464	20,573	15,965

Source: Sunnyvale 2010 UWMP

[1] Projection based on trending of actual usage measured through July 2015.

The decrease in demand from 2005 to 2015 can be attributed to the economic downturn as well as demand conservation due to the extended drought in California. It should be noted the 2015 water use listed in Tables 4-2 and 4-3 are projections prepared in 2011. Current water use trends indicate the actual 2015 water use will be approximately 22% below the 2010 UWMP projections.

Water loss within the City's distribution system can occur from various causes such as leaks, breaks, malfunctioning valves and the difference between the actual and measured quantities from water meter inaccuracies. Other losses come from legitimate uses such as water/sewer main and hydrant flushing, tests of fire suppression systems and street cleaning. The system losses experienced by Sunnyvale's water distribution system have historically been between 4% and 8%. The system loss projections and total demand projections assume a future system loss percentage of approximately 6%, which was recommended by the City in the 2010 UWMP.

Table 4-4 provides all other water uses and losses that are not accounted for in the past and current demands associated with user demand. Saline water intrusion barriers, groundwater recharge, and conjunctive use are not shown below since these uses are managed by SCVWD and are reflected in SCVWD's UWMP for the entire County.

Table 4-4

Additional Water Uses and Losses (AFY)

Water Use	2005	2010	2015	2015 ^[1]
Recycled Water	1,851	1,523	1,400	0
System Losses	1,496	1,288	1,234	1,234
Total	3,347	2,811	2,634	1,234

Source: Sunnyvale 2010 UWMP

[1] Projection based on trending of actual usage measured through July 2015.

SBx7-7 Baseline Water Demand and Water Use Targets

The Water Conservation Act of 2009 (SBx7-7) requires all California urban water agencies to set and meet certain demand reduction targets in order to assist the State in reducing urban water use by 20 percent by 2020. The Act also requires each agency to monitor its progress toward its targets, achieving a 10 percent reduction by 2015. This was implemented for the purpose of meeting the mandate to reduce per capita urban water consumption by 20 percent statewide. SBx7-7 describes the overall process by which the City of Sunnyvale is to comply with the requirements. It specifically identifies methods for establishing urban water use targets. These requirements and the City of Sunnyvale's specific Compliance Plan are outlined in the 2010 UWMP.

The baseline per capita water use for the 10-year period of 1995-2004 is 174 gpcd. Baseline per capita water use during the 5-year compliance period is calculated to be 165 gpcd. Because the 5-year baseline per capita water use is greater than 100 gpcd, the minimum water use reduction requirement must also be calculated. The calculation is used to determine whether the City's 2015 and 2020 water use targets meet the minimum water use reduction requirement (per Section 10608.22 of the California Water Code). The City's calculated per capita water use target is 157 gpcd.

Demand Projections

Population estimates as shown in Table 4-5 were calculated using the DWR methodology 2, Category 1 since the City's service area overlaps the City boundaries by more than 95%. The population estimates are from the May, 2010 data provided by the State Department of Finance (DOF).

Table 4-5

City Population Projections

Year	2010	2015	2020	2025	2030	2035 [1]
City Population	141,099	141,700	147,300	152,000	157,900	174,600

Source: Sunnyvale 2010 UWMP

^[1] Year 2035 is the assumed build-out year under the draft LUTE. This population estimate is based on City projections.

Based on the City's 2015 and 2020 SBx7-7 goal of 157 gpcd, the City's maximum allowable water demand for 2015 and 2020 are 24,916 AFY and 25,901 AFY, respectively. Under the SB x7-7 requirements, the maximum allowable potable water demand generated within the City is 30,701 AFY.

Per the 2010 UWMP and City staff estimates of draft LUTE demands, the present and projected water demands for the City are shown in Table 4-6. It is noted that in Table 4-6, the 2015 projections are referenced from the 2010 UWMP and do not account for any actual 2015 data.

Table 4-6

Current and Projected Potable Water Use by Customer Type (AFY)

Customer Type	2015 ^[1]	2015	2020	2025	2030
Single Family Residential	n/a	6,555	6,393	6,341	6,378
Multi-Family Residential	n/a	7,755	7,563	7,502	7,545
Commercial	n/a	4,507	5,334	6,485	8,100
Irrigation	n/a	905	883	876	881
Other (Firelines)	n/a	850	829	823	827
Total Potable	15,965	20,573	21,002	22,026	23,731

Source: Sunnyvale 2010 UWMP

The demand projections per water supply source is identified in Table 4-7. It is noted that the actual 2015 water usage numbers are trending 22% below the 2010 UWMP projections.

Table 4-7

Current and Projected Demand by Supply Source without Draft LUTE

Supply Source	2015 ^[1]	2015	2020	2025	2030	2035
SFPUC	8,586	10,003	10,003	10,003	10,003	10,003
SCVWD ^[2]	7,237	9,570	9,999	11,023	12,728	12,728
Groundwater Wells	142	1,000	1,000	1,000	1,000	1,000
Total	15,965	20,573	21,002	22,026	23,731	23,731

Table 4-7

Current and Projected Potable Demand by Supply Source (AFY)

Supply Source	2015 ^[1]	2015	2020	2025	2030	2035
SFPUC	8,586	10,003	10,003	10,003	10,003	10,003
SCVWD ^[2]	7,237	9,570	9,999	11,023	12,728	12,728
Groundwater Wells	142	1,000	1,000	1,000	1,000	1,000
Total	15,965	20,573	21,002	22,026	23,731	23,731

Source: Sunnyvale 2010 UWMP

[1] Projection based on trending of actual usage measured through July 2015.

[2] The City obtains water from SCVWD through a requested 3-year delivery. The City has obtained a maximum of 13,577 AFY from SCVWD.

Source: Sunnyvale 2010 UWMP

[1] Projection based on trending of actual usage measured through July 2015.

[2] The City obtains water from SCVWD through a requested 3-year delivery. The City has obtained a maximum of 13,577 AFY from SCVWD.

The additional water uses and expected losses are identified in Table 4-8.

Table 4-8 Current and Projected Additional Water Uses and Loses (AFY)

Water Use	2015 ^[1]	2015	2020	2025	2030
Recycled Water [2]	0	1,400	1,525	1,650	2,298
System Losses	1,234	1,234	1,260	1,321	1,423
Total	1,234	2,634	2,785	2,971	3,721

Source: Sunnyvale 2010 UWMP

[1] Projection based on trending of actual water usage measured through July 2015

[2] Based on Table 4-6 of the 2010 UWMP.

Under normal conditions, the potable water demand with the LUTE Update is projected to be 26,005 AFY in year 2035. Including recycled water, the projected water demand is 27,780 AFY. Build out (year 2035) under the draft LUTE would consist of a water demand of 30,701 AFY under normal year conditions, which is close to SCVWD 2010 UWMP estimate of 29,800 acre-feet annually for 2035 for Sunnyvale. See Table 4-9 for the assumed rate of growth in water demand.

	2015 [1]	2015	2020	2025	2030	2035 ^[2]
Potable Demand (without Draft LUTE)	15,965	20,573	21,002	22,026	23,208	26,129
Draft LUTE Increase	0	0	568	1,137	1,705	2,274
Sub-Total	15,965	20,573	21,570	23,163	25,436	28,926
Recycled Water [3]	0	1,400	1,525	1,650	2,298	2,298
Total	15,965	21,973	23,095	24,813	27,211	30,701

Current and Projected Demand w/ Draft LUTE (AFY)

[1] Projection based on trending of actual water usage measured through July 2015

[2] Based on water duty factors in Table 3-2

[3] Based on Table 4-6 of the 2010 UWMP.

4.2 Water Supply

Table 4-9

The City has three sources of potable water supply: purchased surface water from SFPUC, purchased treated surface water from SCVWD, and groundwater from six, City-owned and operated wells. One additional well remains on stand-by for emergencies. An additional source of non-potable water comes from the City's Water Pollution Control Plant in the form of recycled water. The City also has distribution system inter-ties to the cities of Cupertino, Mountain View, and Santa Clara as well as to California Water Service Company through service connections located within city boundaries that are reserved for use in case of an emergency.

4.2.1 Groundwater

The City of Sunnyvale has six operating wells and one well on stand-by for emergencies. The seven wells are used by the City as a supplemental source to the imported water supplies. The City's current wells are listed in Table 4-10.

Table 4-10

Existing Well Information

		Average Discharge	Average	Total
weir Name		Head	Flow	HGL (ft)

	Ground Elevation (ft)	Average Well Level (ft)	(psi)	(ft)	Rate (gpm)	
Hamilton Well No. 2	201	125	48	110	600	311
Hamilton Well No. 3	201	125	48	110	800	311
Ortega Well	172	98	65	150	1,400	322
Raynor Well	130	60	87	200	1,900	330
Serra Well	200	126	56	130	650	330
Westmoor Well	239	160	61	140	500	379
Losse Well (Emergency Only)	170	100	61	141	400	311

Source: Sunnyvale 2010 Water Utility Master Plan, Table 3-3.

In addition to supplying the City with groundwater, the SCVWD provides the City with basinwide groundwater and conservation planning assistance. Local groundwater supplies up to half of the county's water supply during normal years. The groundwater basin in Santa Clara County is not adjudicated and has not been identified or projected to be in overdraft by DWR.

Conjunctive use management is a practice by which the groundwater basin is pumped more in drier years and then replenished (or recharged) during wet and average years. Groundwater is replenished naturally from rainfall and augmented by SCVWD-operated recharge operations. Conjunctive use helps protect the groundwater basin from overdraft, land subsidence, and saltwater intrusion and provides critical groundwater storage reserves.

Within Santa Clara County, SCVWD manages two groundwater subbasins that transmit, filter, and store water: the Santa Clara Subbasin (DWR Subbasin 2-9.02) and the Llagas Subbasin (DWR Subbasin 3.301). In its water supply planning, the District frequently splits the Santa Clara Subbasin into two subareas, the Santa Clara Plain and the Coyote Valley. Although part of the same subbasin, these two subareas have different groundwater management challenges and opportunities and are in different groundwater charge zones.

These subbasins contain young alluvial fill formation and the older Santa Clara Formation. Both formations are similar in character and consist of gravel, sandy gravel, gravel and clay, sand, and silt and clay. The coarser materials are usually deposited along the elevated lateral edges of the subbasins, while the flat subbasin interiors are predominantly thick silt and clay sections interbedded with smaller beds of clean sand and gravel. The City's groundwater comes from the Santa Clara Plain subarea of the Santa Clara Subbasin. A general discussion of this subarea is provided below.

Santa Clara Plain

The Santa Clara Plain is part of the Santa Clara Subbasin, located in a structural trough that is bounded by the Santa Cruz Mountains to the west and the Diablo Range to the east. The Plain, which is approximately 22 miles long, narrows from a width of 15 miles near the county's northern boundary to about half a mile wide at the Coyote Narrows, where the two ranges nearly converge. The Plain has a surface area of 225 square miles. The Santa Clara Plain is approximately 15 square miles smaller than the Santa Clara Subbasin (Basin 2-9.02) as defined by the DWR in Bulletin 118, Update 2003 since it does not include the Coyote Valley portion of the Santa Clara Subbasin. Although hydraulically connected, SCVWD refers to the Coyote Valley separately since it is in a different groundwater charge zone and has fewer water supply options than the Santa Clara Plain. The Plain underlies the northern portion of Santa Clara County and includes the majority of the streams and recharge facilities operated by SCVWD (SCVWD UWMP, 2010).

In April of each year, when the quantity of imported water available to SCVWD by contract and

the local water yield can be estimated somewhat accurately, SCVWD estimates the carryover storage. Based on the calculated carryover capacity and anticipated customer demand, SCVWD reviews and modifies its groundwater management strategy in order to maintain adequate water in the basin and avoid subsidence.

Groundwater is extracted by way of wells, either owned or operated by area retailers or private property owners. The allowable withdrawal of groundwater by the City depends on a number of factors, including withdrawals by other water agencies, the quantity of water recharged and carryover storage from the previous year. Table 4-11 shows historic metered groundwater pumping data for the City in 2010, 2014 and the current trends for 2015. The table also includes the projected pumping through year 2035 based on the 2010 UWMP.

Table 4-11

Historic and Projected Amount of Groundwater Pumping from the Santa Clara Plain Basin (AFY)

Historic			Projections [1]						
2010	2014	2015 [2]	2015	2020	2025	2030	2035		
1,629	2,064	142	1,000	1,000	1,000	1,000	1,000		

[1] Source: Sunnyvale 2010 UWMP

[2] Projection based on trending of actual water usage measured through July 2015

Although the City has historically called upon groundwater to meet between 4 and 11 percent of its total demand (approximately 1,000 - 2,700 AFY), the City wells have the production capacity to produce approximately 8,000 AFY.

4.2.2 Imported Water (Surface Water)

The City purchases imported water from two sources: the City and County of San Francisco (via the SFPUC), and the Santa Clara Valley Water District (SCVWD).

SFPUC

The City receives imported water from the City and County of San Francisco's Regional Water System (RWS), operated by SFPUC. This supply is predominantly from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts, but also includes treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties.

The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to ensure ongoing reliability of its water supplies.

The SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from Hetch Hetchy. The local watershed facilities are operated to capture local runoff. The business relationship between the SFPUC and its wholesale customers is largely defined by the "Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County" (WSA) entered into in July 2009 (WSA). This 25-year WSA replaced the Settlement Agreement and Master Water Sales Contract that expired in June 2009. The WSA

addresses the rate-making methodology used by the SFPUC in setting wholesale water rates for its customers in addition to addressing water supply and water shortages for the RWS.

The WSA is supplemented by an individual Water Supply Contract between SFPUC and each individual retailer, also entered into in July 2009 (see Appendix A). These contracts also expire in 25 years. The City of Sunnyvale has an Individual Supply Guarantee (ISG) of 12.58 MGD (or approximately 14,100 acre feet per year). Although the WSA and accompanying Water Supply Contract expire in 2034, the ISG (which quantifies San Francisco's obligation to supply water to its individual wholesale customers) survives their expiration and continues indefinitely. The Sunnyvale contract also includes a minimum purchase amount of 8.93 MGD (10,003 AFY), which Sunnyvale agrees to buy, regardless of whether sales drop below this level. As previously stated, the WSA provides for a 184 million gallon per day (MGD, expressed on an annual average basis) Supply Assurance to the SFPUC's wholesale customers. This Assurance is subject to reduction, to the extent and for the period made necessary by reason of water shortage, due to drought, emergencies, or by malfunctioning or rehabilitation of the regional water system. The WSA does not guarantee that San Francisco will meet peak daily or hourly customer demands when their annual usage exceeds the Supply Assurance. The SFPUC's wholesale customers have agreed to the allocation of the 184 MGD Supply Assurance among themselves, with each entity's share of the Supply Assurance set forth on Attachment C to the WSA.

The Water Shortage Allocation Plan between the SFPUC and its wholesale customers, adopted as part of the WSA in July 2009, addresses shortages of up to 20% of system-wide use. The Tier 1 Shortage Plan allocates water from the RWS between San Francisco retail and the wholesale customers during system-wide shortages of 20% or less. The WSA also anticipated a Tier 2 Shortage Plan adopted by the wholesale customers which would allocate the available water from the RWS among the wholesale customers. The Tier 2 agreement was completed and approved by all the wholesale customers in March, 2011.

SFPUC deliveries to the City reached a maximum of 12,675 AFY in 2008. The 2014 deliveries were 8,454 AFY, and the 2015 deliveries are estimated to be 8,586 AFY (based on actual usage through July).

SCVWD

SCVWD supplies the City of Sunnyvale with treated surface water through an entitlement of imported Central Valley Project (CVP) water and the State Water Project (SWP), as well as surface water from local reservoirs. The current contractual agreement between the City and SCVWD sunsets in 2051. It was effective in 1976 with a 75 year term.

SCVWD's imported water is conveyed through the Sacramento-San Joaquin Delta then pumped and delivered to the county through three main pipelines: the South Bay Aqueduct, which carries water from the SWP, and the Santa Clara Conduit and Pacheco Conduit, which bring water from the federal CVP.

SCVWD has a contract for 100,000 AFY from the SWP, and nearly all of this supply is used for municipal and industrial (M&I) needs. The CVP contract amount is 152,500 AFY. However, the actual amount of water delivered is typically significantly less than these contractual amounts and depends on hydrology, conveyance limitations, and environmental regulations. On a long-term average basis, 83% of the CVP supply is delivered for M&I use, and 17% is delivered for irrigation use. Actual deliveries from imported sources vary significantly depending on hydrology, regulatory constraints to protect water quality as well as fish and wildlife, and other factors. SCVWD routinely acquires supplemental imported water to meet the county's needs from the water transfer market, water exchanges, and groundwater banking activities. Local runoff is captured in local reservoirs for recharge into the groundwater basin or treatment at one of SCVWD's three water treatment

plants. The total storage capacity of the District reservoirs is approximately 170,000 AF without the Department of Safety of Dams (DSOD) restrictions. Water stored in local reservoirs provides up to 25% of Santa Clara County's water supply. Reservoir operations are coordinated with imported Bay-Delta water received from the SWP and the CVP.

The quantity of water available to the City is based upon a requested 3-year delivery schedule submitted by the City and approved by the District (see Appendix B). The request for each year in the 3-year delivery schedule may not be less than 95 percent of the maximum amount requested in the 3-year period. District deliveries to the City reached a maximum of 13,577 AFY in 1999. The 2014 deliveries were 8,491 AFY, and the 2015 deliveries are estimated to be 7,237 AFY (based on actual usage through July).

Per the City's 2010 UWMP, the City plans to increase water supply from SCVWD in years ahead to meet the increase in demands.

4.2.3 Recycled Water

The City of Sunnyvale has developed a recycled water program which today serves parks, golf courses and the landscaping needs of diverse industries. A wastewater reclamation program was developed in 1991 when the City first identified short-term goals of recycling wastewater of 20% to 30% of high-quality effluent from the Sunnyvale Water Pollution Control Plant (Plant). The long-term goal of the City is to reuse 100% of all wastewater (15 MGD) generated from the Plant to reduce all flows to the bay, as stated in the 2000 Recycled Water Master Plan. This goal, if attained, would involve the export of water to a location or agency outside the City limits. The Plant has a design flow capacity of 10 MGD for treatment of wastewater from the City.

The City has completed Phases I and II of the 2000 Recycled Water Master Plan, which now serves Baylands Park, Lockheed/Martin Area, the Sunnyvale Municipal Golf Course, and other parks and industrial areas in the northern part of the City. A storage tank was built in the Year 2000 to allow for more recycled water to be developed and stored in order to keep up with demand on the system once the area is built out. In September 2013, the City Council approved the Recycled Water Feasibility Study that identifies possible extensions of the recycled water system. Possible extensions to serve the south end of Sunnyvale along Wolfe road are currently under way. Possible extensions to serve the south end of the City and also Cupertino and Los Altos may be evaluated in the future.

Table 4-12

Current and Projected Recycled Water Use within the City (AFY)

	2015 [2]	2015 [1]	2020 [1]	2025 [1]	2030 ^[3]	2035 ^[3]
Total Recycled Water Use	0	1,400	1,525	1,650	2,298	2,298

[1] Source: Sunnyvale 2010 UWMP.

[2] Recycled water production has been halted in recent years due to operational constriants.

[3] Based on 201 UWMP Table 4-6, 2,298 acre-feet of recycled water would be available after 2030.

In recent years, the City has not been producing recycled water due to discharge requirements to the bay, as well as operational limitations. The City is currently undergoing a project at the wastewater treatment plant that will allow the City to regularly produce recycled water again in 2016.
4.2.4 Desalinated Water

Both SFPUC and SCVWD are working together with the East Bay Municipal Utilities District, Contra Costa Water District, and the Zone 7 Water Agency as the Bay Area Regional Desalination Project (BARDP). BARDP may consist of one or more desalination facilities that would remove salt from seawater or other brackish water sources, with an ultimate total combined capacity of up to 80 MGD. Desalination would provide a potential potable water supply for municipal and industrial use. The goals are to:

- Increase supply reliability by providing water supply when needed from a regional facility.
- Provide additional source of water during emergencies such as earthquakes or levee failures.
- Provide a supplemental water supply source during extended droughts.
- Allow other major facilities, such as treatment plants, water pipelines, and pump stations, to be taken out of service for maintenance or repairs.

Pre-feasibility studies and pilot testing have been completed. Additional details regarding desalinated water opportunities can be found in the SFPUC and SCVWD UWMPs.

A summary of the city's historical and available water supply are referenced in Table 4-13. The city's water supply projections, as identified in the 2010 UWMP are summarized in Table 4-14.

Contractual / Operational Limits Historical Actual Minimum **2015**^[1] Minimum Maximum Supply Source Maximum 2010 2014 SFPUC 10,003 8,454 12,675 8,982 8,454 5,009 14,100 [2] SCVWD 8,176 13,577 9,331 8,491 4,221 0 13,577 123 3,786 2,064 83 0 8,000 Groundwater 1,629 [3] 0 1,523 0 2,298 [4] **Recycled Water** 1,928 0 0 16,753 31,966 21,465 19,008 9,313 10,003 37,975 Total

Table 4-13

Water Supply

[1] Through July 2015

[2] Per SFPUC contract values.

[3] Per Section 5.3.3 of 2010 Water Utility Master Plan,

and updated with recent improvements.

[4] Per Table 4-6 of Sunnyvale UWMP, city will be able to produce recycled water at a maximum of 2,298 AFY by 2030

Table 4-14

Water Supply Projections in a Normal Year (per 2010 UWMP)

	Projections ^[1]					
Supply Source	2015 2020 2025 2030					
SFPUC	10,003	10,003	10,003	10,003		

SCVWD	9,570	9,999	11,023	12,728
Groundwater	1,000	1,000	1,000	1,000
Recycled Water	1,400	1,525	1,765	1,775
Total	21,973	22,527	23,791	25,506

[1] Per Sunnyvale 2010 UWMP.

5.0 WATER SUPPLY RELIABILITY

On January 28, 2014, the Santa Clara Valley Water District's (District) Board of Directors (Board) received the initial 2014 water supply outlook and set a preliminary 2014 water use reduction target equal to 10 percent of 2013 countywide water use. On February 25, 2014, the Board approved a resolution setting a countywide water use reduction target equal to 20 percent of 2013 water use through December 31, 2014, and recommended that retail water agencies, local municipalities and the County of Santa Clara (County) implement mandatory measures as needed to achieve the 20 percent water use reduction target. The call for 20 percent reductions was extended on November 25, 2014, to be in place through June 30, 2015. These actions were based on the District's Water Shortage Contingency Plan and estimated 2014 water supply conditions that showed groundwater reserves would reach the Stage 3 ("Severe") level by the end of the calendar year if water use reduction measures were not implemented.

In early 2015, the statewide drought condition was still in the severe to exceptional stage. Furthermore, local surface water and groundwater supplies were well below average and imported water allocations for 2015 were very low (25% or less). In consideration of the continued severity of the drought and worsening water supply projections, increased water use reductions beyond the previous call for 20 percent were determined to be necessary to preserve groundwater storage. Therefore, on March 24, 2015, the Board called for 30 percent water use reductions, and recommended that retail water agencies, municipalities and the County implement mandatory measures as needed to accomplish that target, including a two day a week outdoor irrigation schedule.

The District's strategic approach developed in February 2014 continues to support Board's increased call for water use reductions and has been an effective approach to respond to the drought. These actions are still the basis of the drought response. Certain strategies may change or increase in response to the call for a 30% reduction. The drought strategies are implemented by a cross- functional team from across the organization (convened when the Drought Response Strategy was formulated). The District's comprehensive drought response is being implemented through fifteen strategies grouped into four general categories: (A) water supply and operations; (B) water use reduction; (C) drought response opportunities; and (D) administrative and financial management.

Severe to exceptional drought conditions continue throughout California (-92%), even though much of the State has received close to average rainfall to date, including Santa Clara County. The U.S. Drought Monitor (August 11, 2015) reports that most of Santa Clara County continues to be in 'Extreme' drought severity, continued from July 2015.

As of August 1, 2015, the local reservoir combined storage is 77% of normal for this time of year (20-year average). The California Department of Water Resources found no snow during its April 1, 2015, manual survey at 6,800 feet in the Sierra Nevada. This was the first time in 75 years of early- April measurements at the Phillips Snow Course that no snow was found. Reservoir storage levels for the primary reservoirs in the state for the imported water supply are 45% to 61% of normal as of August 1. The initial 2015 Central Valley Project allocation is 25%, the lowest the District has ever received, with approximately 40,000 acrefeet to be delivered. The District's State Water Project allocation increased from 15% to 20% on March 2, 2015, or about 20,000 acrefeet. The combined State and Federal Projects allocation for 2015 is 60,000 acrefeet, which is 14% lower than the 70,000 acrefeet allocation in 2014.

During this drought, groundwater recharge has been reduced due to limited surface water availability, and groundwater pumping has increased in some areas to meet Santa Clara County water needs. Because of this, it is estimated that 79,000 acre-feet from the groundwater storage reserve was used in 2014, causing the storage level to drop to approximately 260,000 acre-feet. Managed groundwater recharge in the Santa Clara Plain is 34% of normal due to limited supplies. The groundwater level in Santa Clara Plain is about one foot higher than July last year and about seven feet lower than the five-year average. To augment the reduced imported water allocations, the District was able to retrieve some of its previously-stored water supplies (approximately 35,000 acre-feet) from Semitropic groundwater bank in 2014. The District is currently pursuing withdrawals of up to 45,000 acre-feet from the bank.

The District has been working with water retailers, municipalities and the County of Santa Clara (County) to increase water conservation efforts and public outreach, and to implement other actions to reduce water use. Through these efforts, preliminary water use data from February through December 2014 indicate that cumulative countywide savings of slightly higher than13 percent was realized compared to the same period in 2013. 2015 water retailer water use data (January through July 2015) indicates 25% savings compared to 2013 water use in the same period. The month to month comparison from the preliminary data indicates a steady rate of savings of 36% in July 2015 (unchanged from June 2015).

Local water retailers have responded to the District's increased call for savings in various ways. Most retailers are calling for at least 30 percent reductions, and all have activated or adopted water use restrictions. As a result of the call for increased savings, the retailers have geared up to increase their outreach and education efforts further. In addition, water retailers have needed to implement additional actions in response to the Governor's April 1, 2015, Executive Order and the State Water Resources Control Board's expanded drought-related emergency regulations in effect as of May 18, 2015. For instance, the investor owned retailers are implementing water allocation programs. In addition, the Order also ordered the California Energy Commission to establish standards that improve the efficiency of water appliances available for sale and installation in new and existing buildings. As a result, (as of July 2016), showerhead flow rates will be reduced to 2.0 gallons per minute and will be reduced again in July 2018, to 1.8 gallons, and flow rates for faucets will be reduced to 1.2 gallons per minute.

Two summits, one with the retailers, one with elected officials, have been held to facilitate increased water conservation and water use saving efforts and increase coordination to meet the 30 percent reduction target. A common theme between the two summits was that messaging and policy development needs to be consistent and coordinated.

5.1 City Water Supply Reliability

5.1.1. Groundwater

Protecting the local groundwater basins is critical to maintaining water supply reliability in the County of Santa Clara, especially when random risks are considered. The basins supply nearly half of the water used annually in the County and also provide emergency reserve for droughts or outages.

SCVWD's groundwater management activities are intended protect and sustain local groundwater resources. Groundwater management encompasses activities and programs that identify and mitigate contamination threats to the groundwater basin, replenish and recharge groundwater supplies, prevent groundwater overdraft and land subsidence, and sustain storage reserves. SCVWD programs are intended to sustain and protect groundwater resources, while developing other water supply sources to address needs beyond year 2025.

During this drought, groundwater recharge has been reduced due to limited surface water availability, and groundwater pumping has increased in some areas to meet Santa Clara County water needs. Because of this, it is estimated that we used 79,000 acre-feet from the groundwater storage reserve was used in 2014, causing the storage level to drop to approximately 260,000 acre-feet (350,000 acre-feet is the long-term operational storage capacity for the Santa Clara Plain). Managed groundwater recharge in the Santa Clara Plain is 34% of normal due to limited supplies. The groundwater level in Santa Clara Plain is about one foot higher than July last year and about seven feet lower than the five-year average. To augment the reduced imported water allocations, the District was able to retrieve some of its previously-stored water supplies (approximately 35,000 acre-feet) from Semitropic groundwater bank in 2014. The District is currently pursuing withdrawals of up to 45,000 acre-feet from the bank. The total storage capacity available to SCVWD in the Semitropic Water Bank is 350,000 AF and the current storage balance as of August 1, 2015 is 220,590 AF (SCVWD August 2015 Drought Monthly Status Report). Thus, the District is managing the groundwater resources in a manner to address the drought conditions and protect local groundwater resources.

5.1.2. SCVWD Imported Water

To maintain water supply reliability and flexibility, SCVWD's water supply includes a variety of sources including local groundwater, imported water and local surface water. SCVWD has an active conjunctive water management program to optimize the use of groundwater and surface water, and to prevent groundwater overdraft and land subsidence.

Several factors have the potential to negatively impact reliability, including: hydrologic variability, climate change, invasive species, infrastructure failure, regulatory actions as well as institutional, political and other uncertainties. Hydrologic uncertainties influence the projections of both local and imported water supplies and the anticipated reliability of those supplies. Supply analyses performed by SCVWD are based on the assumption of historical patterns of precipitation. The development of SCVWD projects and programs to meet future needs takes hydrologic variability and climate change into account.

Under any climate change scenario, SCVWD may need to consider additional treatment options to respond to water quality impacts associated with increased salinity in the Delta. SCVWD may also need to consider additional storage to take advantage of more wet-season water, additional supplies to replace reduced water supply from existing sources, and additional water transfers (depending on water market impacts).

In determining the long-range availability of water, consideration must be given to the vulnerability of imported supplies to the effects of prolonged state-wide drought and environmental impacts. Reductions by DWR or the U.S. Bureau of Reclamation (USBR) to SCVWD allocations of State Water Project (SWP) or Central Valley Project (CVP) – San Felipe Division water may result in a temporary supply shortfall for the City and other SCVWD retailers.

Water demands could be met with groundwater, additional imported water supply, water conservation measures, and with expanded recycled water use.

SCVWD obtains its local and imported water supplies from a variety of sources to maintain maximum efficiency, flexibility, and reliability. SCVWD augments natural groundwater recharge with a managed recharge program to offset groundwater pumping, sustain storage reserves, and minimize the risk of land subsidence. Through these recharge activities, SCVWD works to keep groundwater basins "full" to protect against drought. Storing surplus water in the groundwater basins enables part of the supply to be carried over from wet years to dry years. SCVWD also has a contract for 100,000 AFY from the SWP, and 152,500 AFY from the CVP. However, the actual amount of water delivered is typically significantly less than these contractual amounts and depends on hydrology, conveyance limitations, and environmental regulations, including regulatory constraints to protect water quality as well as aquatic wildlife. On a long-term average basis, 83% of the CVP supply is delivered for municipal and industrial use, and 17% is delivered for irrigation use. SCVWD routinely acquires supplemental imported water to meet the county's needs from the water transfer market, water exchanges, and groundwater banking activities.

In May 1996, SCVWD approved an agreement with Semitropic Water Storage District (Semitropic) to store 45,000 AF of SWP water in Semitropic's groundwater basin on behalf of SCVWD. In 1997, SCVWD approved a long-term agreement with Semitropic. In the fourteen years since this agreement was approved, SCVWD has banked water in ten of the years, while withdrawing water in only four. The agreement allows SCVWD to maximize the economic value of its imported water contracts by fully utilizing water that might otherwise have to be turned back to the SWP or CVP. For example, in 2006, a very wet year, SCVWD was able to store nearly 58,000 AF of imported water for use in future dry years. The total storage capacity available to SCVWD in the Semitropic Water Bank is 350,000 AF and the current storage balance as of August 1, 2015 is 220,590 AF (SCVWD August 2015 Drought Monthly Status Report).

If demands are anticipated to reach the upper end of the demand range, SCVWD could consider additional long-term transfers. At present, SCVWD has two agreements that are classified as long-term transfers. In 1998, SCVWD and two other agencies (Pajaro Valley Water Management Agency and Westlands Water District) jointly participated in the permanent assignment of 6,260 AF from Mercy Springs Water District, an agricultural CVP contractor. Under the agreement, SCVWD has an option for dry-year supplies totaling at least 20,000 AF over a 20-year period. The dry-year option may continue for subsequent terms depending on the future plans of Pajaro Valley Water Management Agency.

5.1.3. SFPUC Imported Water

The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to ensure the reliability of its water supplies.

The SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from Hetch Hetchy. In practice, the local

watershed facilities are operated to capture local runoff. The following describes allocation of SFPUC water supply during drought conditions.

5.1.3.1 Water Shortage Allocation Plan

In July 2009, in connection with the WSA, the wholesale customers and the City of San Francisco adopted a Water Shortage Allocation Plan (WSAP) to allocate water from the regional water system to retail and wholesale customers during system-wide shortages of up to 20% (the "Tier One Plan"). The Tier One Plan replaced the prior Interim WSAP, adopted in 2000, which also allocated water during shortages up to 20%. The Tier One Plan also allows for voluntary transfers of shortage allocations between SFPUC and any wholesale customer and between wholesale customers themselves. In addition, water "banked" by a wholesale customer, through greater than required reductions in usage, may also be transferred.

Tier One Drought Allocations

The Tier One Plan, which allocates water between San Francisco and the wholesale customers collectively, distributes water based on the level of shortage:

Table 5-1

Distribution of Water Based on Level of System-Wide Reduction

Level of System Wide Reduction	Share of Available Water				
in Water Use Required	SFPUC Share	Wholesale Customers Share			
5% or less	35.5%	64.5%			
6% through 10%	36.0%	64.0%			
11% through 15%	37.0%	63.0%			
16% through 20%	37.5%	62.5%			

The Tier One Plan will expire at the end of the term of the WSA, unless extended by San

Francisco and the wholesale customers.

Tier Two Drought Allocations

The wholesale customers have negotiated and adopted the "Tier Two Plan," the second component of the WSAP which allocates the collective wholesale customer share among each of the 26 wholesale customers. This Tier Two allocation is based on a formula that takes multiple factors into account for each wholesale customer, including:

Individual Supply Guarantee;

Seasonal use of all available water supplies; and

Residential per capita use.

The water made available to the wholesale customers collectively will be allocated among them in proportion to each wholesale customer's Allocation Basis, expressed in million gallons per day (MGD), which in turn is the weighted average of two components. The first component is the wholesale customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the wholesale customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain wholesale customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all wholesale customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each wholesale customer is determined by multiplying the amount of water available to the wholesale customers collectively under the Tier One Plan, by the wholesale customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the wholesale customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each wholesale customer will also change. However, for long-term planning purposes, each wholesale customer shall use as its Allocation Factor, the value identified in the Tier Two Plan, when adopted. The Tier Two Plan will expire in 2018 unless extended by the wholesale customers.

5.1.3.2 Water System Improvement Program

In order to enhance the ability of the SFPUC water supply system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC has undertaken the Water System Improvement Program (WSIP), approved October 31, 2008. The WSIP will deliver capital improvements aimed at enhancing the SFPUC's ability to meet its water service mission of providing high quality water to customers in a reliable, affordable and environmentally sustainable manner. Many of the water supply and reliability projects evaluated in the WSIP were originally put forth in the SFPUC's Water Supply Master Plan (2000).

A Program Environmental Impact Report (PEIR) was prepared in accordance with the California Environmental Quality Act for the WSIP. The PEIR, certified in 2008, analyzed the broad environmental effects of the projects in the WSIP at a program level and the water supply impacts of various alternative supplies at a project level. Individual WSIP projects are also undergoing project specific environmental review as required.

In approving the WSIP, SFPUC adopted a Phased WSIP Variant for water supply that was analyzed in the PEIR. This Phased WSIP Variant established a mid-term water supply planning milestone in 2018 when SFPUC would reevaluate water demands through 2030. At the same meeting, SFPUC also imposed the Interim Supply Limitation, which limits the volume of water that the member agencies and San Francisco can collectively purchase from Regional Water System (RWS) to 265 MGD until at least 2018. Although the Phased WSIP Variant included a

mid-term water supply planning milestone, it did include full implementation of all proposed WSIP facility improvement projects to insure that the public health, seismic safety, and delivery reliability goals were achieved as soon as possible.

Interim Supply Limitation

As part of its adoption of the WSIP, SFPUC adopted a water supply element, the Interim Supply Limitation (ISL), to limit sales from the RWS watersheds to an average of 265 MGD annually through 2018. The wholesale customers' collective allocation under the ISL is 184 MGD and San Francisco's is 81 MGD. Although the wholesale customers did not agree to the ISL, the WSA provides a framework for administering the ISL. Strategies to address wholesale customers' unmet needs resulting from the ISL are discussed in greater detail below.

Interim Supply Allocations

The Interim Supply Allocations (ISAs) refer to each individual wholesale customer's share of the ISL. On December 14, 2010, SFPUC established each agency's ISA through 2018. In general, SFPUC based the allocations on the lesser of the projected fiscal year 2017-18 purchase projections or Individual Supply Guarantees. The ISAs are effective only until December 31,

2018 and do not affect the Supply Assurance or the Individual Supply Guarantees. Sunnyvale's ISA is 9.44 MGD.

As stated in the WSA, the wholesale customers do not concede the legality of SFPUC's establishment of the ISAs and Environmental Enhancement Surcharge, discussed below, and expressly retain the right to challenge either or both, if and when imposed, in a court of competent jurisdiction.

Environmental Enhancement Surcharge

SFPUC plans to establish the Environmental Enhancement Surcharge concurrently with the budget-coordinated rate process. This surcharge will be unilaterally imposed by SFPUC on individual wholesale customers, and SFPUC retail customers, when each agency's use exceeds their ISA and when sales of water to the wholesale customers and City of San Francisco retail customers, collectively, exceeds the Interim Supply Limitation of 265 MGD.

5.1.3.3 Water Conservation Implementation Plan

In September 2009, BAWSCA completed the Water Conservation Implementation Plan (WCIP). The goal of the WCIP is to develop an implementation plan for BAWSCA member agencies to attain the water efficiency goals that the agencies committed to in 2004 as part of the PEIR. The WCIP's goal was expanded to include identification of how BAWSCA member agencies could use water conservation as a way to continue to provide reliable water supplies to their customers through 2018 given the SFPUC's 265 MGD ISL. SFPUC imposed the ISL on October

31, 2008, to limit the volume of water that the BAWSCA member agencies and City of San Francisco can collectively purchase from the RWS to 265 MGD until at least 2018.

Based on the WCIP development and analysis process, BAWSCA and its member agencies identified five new water conservation measures, which, if implemented fully throughout the BAWSCA service area, could potentially save an additional 8.4 MGD by 2018 and 12.5 MGD by

2030. The demand projections for the BAWSCA member agencies, as transmitted to SFPUC on

June 30, 2010, indicate that collective purchases from SFPUC will stay below 184 MGD through 2018 as a result of revised water demand projections, the identified water conservation savings, and other actions.

Several member agencies have elected to participate in the BAWSCA regional water conservation programs and BAWSCA continues to work with individual member agencies to incorporate the savings identified in the WCIP into their future water supply portfolios with the goal of maintaining collective SFPUC purchases below 184 MGD through 2018.

5.1.3.4 Long Term Reliable Water Supply Strategy

BAWSCA's water management objective is to ensure that a reliable, high quality supply of water is available where and when people within the BAWSCA service area need it. A reliable supply of water is required to support the health, safety, employment, and economic opportunities of the existing and expected future residents in the BAWSCA service area and to supply water to the agencies, businesses, and organizations that serve those communities. BAWSCA is developing the Long-Term Reliable Water Supply Strategy (Strategy) to meet the projected water needs of its member agencies and their customers through 2035 and to increase their water supply reliability under normal and drought conditions.

The Strategy is proceeding in three phases. Phase I was completed in 2010 and defined the magnitude of the water supply issue and the scope of work for the Strategy. Phase II will result in a refined estimate of when, where, and how much additional supply reliability and new water supplies are needed throughout the BAWSCA service area through 2035, as well as a detailed analysis of the water supply management projects, and the development of the Strategy implementation plan. Phase III will include the implementation of specific water supply management projects. Depending on cost-effectiveness, as well as other considerations, the projects may be implemented by a single member agency, by a collection of the member agencies, or by BAWSCA in an appropriate timeframe to meet the identified needs. Project implementation will continue throughout the Strategy planning horizon, in coordination with the timing and magnitude of the supply need.

The development and implementation of the Strategy will be coordinated with the BAWCSA member agencies and will be adaptively managed to ensure that the goals of the Strategy (i.e., increased normal and drought year reliability) are efficiently and cost-effectively being met.

5.2 FACTORS AFFECTING WATER SUPPLY

In addition to droughts, there are other threats to sources of water supply. Sunnyvale relies on their diversification of water supply, continuous work with SFPUC and SCVWD, demand management strategies, and the Water Conservation Plan to address these threats.

5.2.1. Global Climate Change

The issue of climate change has become an important factor in water resources planning in the State, and is frequently being considered in urban water management planning activities, though the extent and precise effects of climate change remain uncertain. As described by the SFPUC in its Final Water Supply Availability Study for the City and County of San Francisco, dated October 2009, there is evidence that increasing concentrations of greenhouse gases have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, there is evidence that a warming trend occurred during the latter part of the 20th century and will likely continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, intensity and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

According to the SFPUC (2009), other than the general trends listed above, there is no clear scientific consensus on exactly how climate change will quantitatively affect the state's water supplies, and current models of water systems in California generally do not reflect the potential effects of climate change.

Initial climate change modeling completed by SFPUC indicates that about seven percent of runoff currently draining into Hetch Hetchy Reservoir will shift from the spring and summer seasons to the fall and winter seasons in the Hetch Hetchy basin by 2025. This percentage is within the current inter-annual variation in runoff and is within the range accounted for during normal runoff forecasting and existing reservoir management practices. The predicted shift in runoff timing is similar to the results found by other researchers modeling water resource impacts in the Sierra Nevada due to warming trends associated with climate change.

The SFPUC has stated that based on this preliminary analysis, the potential impacts of climate change are not expected to affect the water supply available from the San Francisco RWS or the overall operation of the RWS through 2030.

SFPUC views the assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. To refine its climate change

analysis and expand the range of climate parameters being evaluated, as well as expand the timeframes being considered, the SFPUC is currently undertaking two additional studies. The first utilizes a newly calibrated hydrologic model of the Hetch Hetchy watershed to explore sensitivities of inflow to different climate change scenarios involving changes in air temperature and precipitation. The second study will seek to utilize state-of-the-art climate modeling techniques in conjunction with water system modeling tools to more fully explore potential effects of climate change on the SFPUC water system as a whole. Both analyses will consider potential effects through the year 2100.

5.2.2. Delta Pumping Restrictions

Increases in average temperature due to climate change are generally agreed upon and the impacts of increasing temperature have already been observed. Climate change effects on precipitation are more difficult to predict, with some models forecasting less rainfall for the state and some models forecasting more rainfall. Regardless of the impacts on the total amount of precipitation, rises in average temperature will increase sea level and decrease the snow pack—by far the largest surface water "storage" facility in California. Decreased snow pack and projected earlier spring melts will reduce the amount of water available to meet peak demands in late spring and summer. These changes could decrease imported water and possibly local water supplies, while increasing salinity in the Delta, adversely impacting water quality and Bay- Delta ecosystems.

Based on the SWP Delivery Reliability Report 2009 and associated CALSIM II modeling results, projected imported supplies under climate change conditions from the Delta for average, normal year, dry year and multiple dry years, Delta imports are reduced by three percent on average and four percent over the multiple dry year period compared to the analysis performed without climate change (SCVWD, 2010 UWMP).

5.2.3. Natural Disasters

Disasters such as earthquakes could threaten water delivery infrastructure. SFPUC and SCVWD are taking steps to ensure water supply reliability. Following San Francisco's experience with the 1989 Loma Prieta Earthquake, the SFPUC created a departmental *Emergency Operations Plan* (SFPUC EOP). The SFPUC EOP was originally released in 1992, and has been updated on average every two years. The latest plan update will be released in Spring, 2011. The SFPUC EOP addresses a broad range of potential emergency situations that may affect the SFPUC and that supplements the City and County of San Francisco's EOP prepared by the Department of Emergency Management and most recently updated in 2008. Specifically, the purpose of the SFPUC EOP is to describe the department's emergency management organization, roles and responsibilities and emergency policies and procedures.

In addition, SFPUC divisions and bureaus have their own EOPs that are in alignment with the SFPUC EOP and describe each division's/bureau's specific emergency management organization, roles and responsibilities and emergency policies and procedures. The SFPUC tests its emergency plans on a regular basis by conducting emergency exercises. Through these exercises the SFPUC learns how well the plans will or will not work in response to an emergency. Plan improvements are based on exercise and sometimes real world event response and evaluation. Also, the SFPUC has an emergency response training plan that is based on federal, state and local standards and exercise and incident improvement plans.

SFPUC employees have emergency training requirements that are based on their emergency response role.

5.2.3.1 SFPUC Emergency Drinking Water Planning

In February 2005, the SFPUC Water Quality Bureau published a City Emergency Drinking Water Alternatives report. The purpose of this project was to develop a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. The report addresses immediate response after a major disaster. Since the publication of this report the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

Public Information and materials for home and business;

Designation and identification of 67 emergency drinking water hydrants throughout San Francisco;

Purchase of emergency related equipment including water bladders and water bagging machines to help with water distribution post disaster; and

Coordinated planning with City Departments, neighboring jurisdictions and other public and private partners to maximize resources and supplies for emergency response

With respect to emergency response for the SFPUC Regional Water System, the SFPUC has prepared the *SFPUC Regional Water System Emergency Response and Recovery Plan* (ERRP), completed in 2003 and updated in 2006. The purpose of this plan is to describe the SFPUC RWS emergency management organizations, roles and responsibilities within those organizations, and emergency management procedures. This contingency plan addresses how to respond to and to recover from a major RWS seismic event, or other major disaster. The ERRP complements the other SFPUC emergency operations plans at the Department, Division and Bureau levels for major system emergencies.

The SFPUC has also prepared a *SFPUC-Suburban Customer Water Supply Emergency Operations and Notification Plan.* The plan was first prepared in 1996 and has been updated several times. The purpose of this plan is to provide contact information, procedures and guidelines to be implemented by the following entities when a potential or actual water supply problem arises: the SFPUC Water Supply and Treatment Division (WS&TD), Water Quality Bureau (WQB), and SFPUC wholesale customers, BAWSCA, and City Distribution Division (CDD – considered to be a customer for the purposes of this plan). For the purposes of this plan, water quality issues are treated as potential or actual supply problems.

Power Outage Preparedness and Response

SFPUC's water transmission system is primarily gravity fed, from the Hetch Hetchy Reservoir to the City and County of San Francisco. Within San Francisco's in-city distribution system, the key pump stations have generators in place and all others have connections in place that would allow portable generators to be used.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

The Tesla disinfection facility, the Sunol Valley Water Treatment Plant, and the San Antonio Pump Station have back-up power in place in the form of generators or diesel powered pumps. Additionally, both the Sunol Valley Water Treatment Plant and the San Antonio Pump Station would not be impacted by a failure of the regional power grid because it runs off of the SFPUC hydro-power generated by the RWS.

Both the Harry Tracy Water Treatment Plant and the Baden Pump Station have backup generators in place.

Additionally, the WSIP includes projects which will expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

5.2.3.2 SCVWD Water Utility Infrastructure Reliability Project

In 2003, SCVWD initiated the Water Utility Infrastructure Reliability Project (IRP) to determine the current reliability of its water supply infrastructure (pipes, pump stations, treatment plants) and to appropriately balance level of service with cost. The project measured the baseline performance of critical facilities in emergency events and identified system vulnerabilities. The study concluded that SCVWD's water supply system could suffer up to a 60-day outage if a major event, such as a 7.9 magnitude earthquake on the San Andreas Fault, were to occur. Less severe hazards, such as other earthquakes, flooding and regional power outages had less of an impact on SCVWD, with outage times ranging from one to 45 days.

The level of service goal identified for the IRP was "Potable water service at average winter flow rates available to a minimum of one turnout per retailer within seven days, with periodic one day interruptions for repairs." In order to meet this level of service goal, the project developed seven portfolios to mitigate the identified system risks, and identified a recommended portfolio for implementation. As a result, SCVWD has been implementing the recommended portfolio of reliability improvement projects (Portfolio 2). The cost to implement Portfolio 2 is estimated to be approximately \$175 Million. Portfolio 2 is expected to reduce the post-earthquake outage period from 45-60 days to 7-14 days.

Additionally, SCVWD routinely monitors the conditions of all their ten dams used for both water supply and flood prevention. Seismic safety evaluations on eight dams are planned by 2013.

5.2.3.3 Sunnyvale Catastrophic Supply Interruption Planning

In 2004, G&E Engineering conducted a seismic vulnerability study of Sunnyvale's water system. According to their findings, a magnitude 7.9 earthquake on the San Andreas Fault would cause Sunnyvale's water system to fail. An earthquake of that magnitude would result in a prolonged loss of water service to over 131,000 people and the calculated loss of function of the water system for up to 60 days. To mitigate the failure of the water system, the City has seismically retrofitted its two (2) 5 million gallon storage tanks at Wright Avenue and is proposing to retrofit more key water infrastructure components that may be at risk. The City has prioritized seismic vulnerability mitigation projects and included them in its 20-year Capital Improvements Plan. Future projects will be completed according to this plan contingent upon available funding.

5.3 WATER SHORTAGE CONTINGENCY PLANNING

5.3.1. Stages of Action

On May 12, 2015, the City of Sunnyvale City Council adopted Resolution No. 693-15, declaring a continued water emergency, increasing the water reduction target to 30 percent, reimplementing Stage 1 water use prohibitions, imposing additional drought restrictions and amending Resolution 650-14 to add administrative fines for violations.

Sunnyvale staff previously developed a water shortage contingency plan that includes mandatory (and voluntary) water use restrictions, rate block adjustment, and approaches for enforcement associated with each stage of anticipated reduction.

As stated above, the following Table 5-2 describes the four levels of supply reductions that were used for development of Sunnyvale's water shortage contingency plan.

Stage No.	% Shortage	Water Supply Conditions
1	25%	25% shortage declared by wholesale water agency. Shortage conditions are worsening. Ground water levels continue to decrease.
2	35%	35% shortage declared by wholesale water agency. Signs of multiyear drought.
3	45%	45% shortage declared by wholesale water agency. Continued signs of multiyear drought.
4	50% or greater	Greater than 50% shortage declared by wholesale water agency. Typically meant for immediate crisis such as major infrastructure failure. Water supply reserved for health and safety needs.

 Table 5-2:

 Water Shortage Contingency – Rationing Stages to Address Shortages

5.3.2. Prohibitions, Penalties, and Consumption Reduction Methods

Table 5-3 details the use restrictions for each stage of reduction.

Table 5-3

Water Shortage Contingency – Mandatory Prohibitions

Stage No.	Prohibition
	-Flooding or runoff on sidewalks, streets or gutters:
	Cleaning sidewalks, driveways, buildings, patios, parking lots or other paved/hard
Stage 1	surfaced areas
25%	Using hose for washing cars, buses, boats, trailers without positive automatic
	shutoff valve on hose
	-Use of decorative fountains

	-Water waste due to broken/defective plumbing, sprinkler, watering or irrigation
	Systems
	-Restaurant water service unless requested
	-Landscape irrigation during daylight hours
	-Hydrant flushing (unless for public health or safety)
	-All of the above
	-New installations of plants, shrubs, trees, lawns other growing things
Stage 2	-Landscape for mounds, hardscape okay but cannot include living plant material
35%	-New swimming pool or pond construction
	-Filling or refilling swimming pools (can replace water loss due evaporation)
	-Outdoor watering December through March
	-All of the above
Stage 3	-Watering turf, grass or dichondra lawns (can provide minimal water for sports
45%	playing fields)
	-Gold courses except for tees and greens
	-All of the above
Stage 4	Landscape irrigation with potable water of any City-owned premises or
50% or	businesses where recycled water is available for connection
greater	-Utilization of potable water for any City operation where recycled water could be
	used.

In addition, Sunnyvale has adopted a series of water conservation action plans for City departments that correspond to the 25, 35, 45, and 50 percent or greater reduction scenarios. These plans apply mandatory prohibitions to potable water usage at City golf courses, City parks, City streetscape trees and landscaping, and public safety. The rates and charges for water services will be further increased for the 50% reduction case.

5.3.3. Water Rate Structure for Conservation

A major part of Sunnyvale's strategy for water conservation developed in 1989 is a block rate pricing structure involving a lifeline rate set at 15% above the existing rates, a conservation block rate set at a multiple of two times usage in applicable existing rate blocks, and a high impact/high use category at a multiple of 3.5 times the existing rate blocks. The lifeline category exists for all categories of users whereas the conservation and high use rates are applied to recognize the greatest opportunities and needs for reduction and to be sensitive to the importance of manufacturing production and commercial needs. The same approach would be used should the City move to a 35, 45, or 50 percent or greater reduction. However, the multipliers would escalate.

Separate metering systems have been set up for fire and landscape uses with potable water utilized for landscaping purposes at a different rate than domestic water.

Table 5-4

Water Shortage Contingency – Penalties and Charges

Stage No.	Description	Penalty/Charge
2	Fine for non-essential water uses as described in City ordinance	Not to exceed \$1,000
2	Cost Recovery for installation and removal of flow restricting valves	\$100

Resolution 693-15 implemented maximum 2-day per week watering schedules, limited watering within 2 days of a rain event, placed limitations on hotels and newly constructed homes, and allows the City to implement fines for the following citations:

- 1st Violation: Written warning
- 2nd Violation: Written warning
- 3rd Violation: \$250
- 4th Violation and subsequent violations: \$500

5.3.4. Enforcement Approach

The thrust of enforcement of Sunnyvale's conservation program is to solicit cooperation from water users who are unaware of the restrictions or have failed to comply with the provisions of the ordinance. Every effort is made to inform these users of the need for conserving water. If discussions with the user are unsuccessful in obtaining compliance, enforcement mechanisms are available.

The Departments of Public Works and Public safety cooperate on the responsibility for enforcement of the City's conservation plan. Computerized systems track complaints throughout the enforcement process. The process involves first establishing contact with the individual who may be in violation, giving the individual information about code requirements and verbally requesting that the user comply with these requirements. If a complaint has been registered with Neighborhood Preservation, the complainant is contacted and notified of the process. Upon receipt of a notice of a second violation, the violator will receive a written notice to comply and a warning that the next violation may result in a citation and/or the installation of a flow restricting device at the water meter. This flow restricting device would reduce the flow of water to a trickle, thereby allowing the occupant only enough water for health and sanitation purposes. If there are further complaints and a citation is to be issued, the Department of Public Safety is called to issue the citation.

A "hot line" telephone number is established for drought information and to register complaints. Trained staff is available to provide information and to respond to complaints.

5.3.5. Analysis of Revenue Impacts of Reduced Sales During Shortages

In the event of a water shortage scenario, water fund revenues may decrease from the implementation of conservation measures and corresponding reduction in water sales. Conversely, expenses will increase as a result of the implementation and enforcement of water

conservation measures. Expenditures will also rise on a per-unit basis, as wholesalers increase their per-unit price to compensate for the loss of revenue from wholesale sales.

The City has several options to address financial issues during a water shortage. First, the City retains two significant reserves, one for operating contingencies (Contingency Reserve) such as water shortages that is set at 25% of operations and purchased water costs, and a second for the purpose of stabilizing rates over time (Rate Stabilization Reserve). Each will help the City balance the water fund during supply shortages. The City is developing an emergency tiered rate structure that sends hard conservation pricing signals to customers during a period of supply shortage. Finally, the City has four sources of supply and the ability to move most of its supply from any one point to any other point (the exception being recycled water). In the event of a water shortage, especially in the short term, the City has multiple supply options that should contribute to a more-stable revenue base than if the City were under very limited wholesale supplies.

5.3.6. Water Use Monitoring Procedure

For the purposes of implementing the water shortage contingency plan, the City relies on both staff observations regarding excessive water use as well as customer complaints. City staff is also studying the economic and operational feasibility of using metering technology to implement the plan, but no specific plans exist to make such a change.

5.4 DROUGHT PLANNING

5.4.1. Average/Normal Water Year

The "normal" year for the purposes of the current UWMP, is a year in the historical sequence that most closely represents median runoff levels and patterns. Carryover storage is that portion of SCVWD's local and outside of the county surface storage, local groundwater storage, and outside the county banked storage that is not required to meet this year's demands but could potentially be utilized in subsequent years. Note that groundwater is used in all year types (including years where the total supplies exceed total demands) for distribution, storage and treatment. The average/normal water year used by both wholesalers and the City is 2002.

The City selected 1985 as a representation of a "normal" or "average" water year based on an analysis of past water use. The year 1985 was determined to be representative of a year with both average precipitation and average water usage by the City.

5.4.2. Single-Dry Year Supply

The single dry year supply is defined as the year with the minimum usable supply. The hydrology of 1977 represents the minimum total supply that has been observed in the historical record according to SCVWD. SCVWD will be able to meet the water needs of the county during the single dry year even with increasing demands, based on the historical hydrologic sequence and carryover supplies that are projected to be available leading into a single dry year. If a similar dry year occurred when carryover storage was not available, implementation of actions associated with the water shortage contingency plan would be required.

In the single dry year analysis, supplies for SCVWD from carryover storage are needed to meet the annual demands under all demand years and make up almost half of the total supplies in the single dry year. SCVWD's ability to take water from the Semitropic Water Bank is proportional to SWP allocation percentages for the year. During drought years, this can significantly limit how much of its water bank balance SCVWD can withdraw.

SFPUC modeling and historic hydrological sequence identifies 1978 as the model single dry year. The City selected 1977 as the single dry year since groundwater managed by SCVWD will be relied upon to make up the deficit from water wholesalers.

5.4.3. Multiple-Dry Year Supply

Multiple dry year scenario analysis is useful particularly in the evaluation of carryover storage. Evaluating the availability of the county's water supplies requires an understanding of the driest periods that can reasonably be expected to occur. Over the more than 120 years of recorded rainfall, seven major drought events have occurred. SCVWD modeling results indicate that the county's water supply system is more vulnerable to successive dry years, such as those that occurred in 1928-1934 and 1987-1992. Multiple dry year periods deplete water storage reserves in local and imported supply reservoirs and in the groundwater subbasins. Multiple dry years (such as the 1987-1992 drought) pose the greatest challenge to SCVWD's water supply. Although the supply in each year may be greater than in a single very dry year, as drought lingers, storage reserves are relied on more and more. The multiple dry year period selected by the City for analysis is from 1987 through 1990.

The water supply available to individual retailers will ultimately be determined by SCVWD and SFPUC. The City will work closely with SCVWD, SFPUC, and other water retail agencies to implement any stages of action to reduce the demand for water during water shortages.

Table 5-5 summarizes the average, single dry, and multiple dry water years used to determine the minimum water supply available as compared to the average/normal water year.

Water Year Type	Base Year(s)			
Average Water Year	1985			
Single Dry Water Year	1977			
Multiple Dry Water Years	1987-1990			

Table 5-5 Basis of Water Year Data

As discussed earlier in this report, the City relies mostly on SFPUC and SCVWD for its water supply and is directly affected by the water supply conditions both wholesaler faces. This section discusses water supply conditions as it affects the wholesalers.

5.4.4. SFPUC

SFPUC historically has met demand in its service area in all year types from its Tuolumne River, Alameda Creek, and San Mateo County watersheds. In general, 85% of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15% comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San

Andreas Reservoirs. SFPUC's adopted WSIP retains this mix of water supply for all year types. In order to achieve its target of meeting at least 80% of its customer demand during droughts, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP. SFPUC proposes to expand their water supply portfolio by increasing the types of water supply resources to meet future demands. This includes approximately 2,240 AFY of transfers and 8,100 AFY of groundwater from the Westside Basin.

The Tier One and Tier Two Plans, as earlier described, would be implemented as necessary in the event of a shortage of SFPUC supplies.

5.4.5. SCVWD

As a result of the 1987 to 1992 drought, local reservoirs were reduced and wholesalers received only partial entitlement from its imported sources. In response to these circumstances, SCVWD instituted an aggressive water conservation program and augmented imported sources of water with additional water supplies. Since the end of the drought, local reservoir levels have returned to normal, allowing greater flexibility to meet water demands during a short-term dry period.

In the event of a multiple dry year supply scenario occurring between now and 2020, supplies for SCVWD and groundwater are planned to be adequate to continue to meet the increased demands, while supplies from SFPUC will decrease. The City will compensate for temporarily decreased supply from SFPUC by using additional groundwater supply as available. SCVWD has accounted for additional groundwater pumping during a single-dry and multiple-dry years. Subsequent to 2020, implementation of water shortage contingency plan actions would be required to reduce demands by approximately 20-25% in the fifth year and beyond of a multi-year drought.

5.4.6. Supply Availability/Sufficiency

In the event of a decrease of local supplies, the City would respond by pursuing demand reduction programs in accordance with the severity of the supply shortage. Any supply deficit would be compensated for by increased conservation levels and restrictions in consumption.

An analysis of the supplies historically available during times of shortage is reflected in Table 5-6. This analysis does not account for population and system growth, and reflects the amount of supply available to meet the system's demands during the designated years. Based on the SCVWD August 2015 Drought Monthly Status Report, the City has reduced its water use by 26% as compared to 2013 through the month of July and has used a total 9,313 AF of water between January and July 2015. An analysis of the current supply reliability is reflected in Table 5-7.

Table 5-6

Supply Reliability - Historic Conditions (AFY)

			Multiple Dry Years			
Water Source	Normal Water Year (1985)	Single Dry Water Year (1977)	Year 1 (1987)	Year 2 (1988)	Year 3 (1989)	Year 4 (1990)
SCVWD	9,199	6,636	10,335	12,073	11,503	10,499
SFPUC	13,209	10,956	10,956	9,522	9,522	10,870
Groundwater	8,369	5,104	4,019	4,116	2,509	1,973
Totals	30,777	22,696	25,310	25,711	23,534	23,342
Percent of Normal Year		75.0%	83.6%	84.9%	77.7%	77.1%

Table 5-7

Supply Reliability - Current Conditions (AFY)

		Multiple Dry Years				
Source	Average/Normal Water Year 2002	Year 2012	Year 2013	Year 2014	Year 2015 ^[1]	
SFPUC	10,096	9,705	11,031	8,454	8,586	
SCVWD	13,094	10,672	10,417	8,491	7,237	
Groundwater	1,367	143	123	2,064	142	
Recycled Water	1,296	0	0	0	0	
Totals	25,852	20,519	21,571	19,008	15,965	
Percent of Average/Normal		79%	83%	74%	62%	

[1] Values projected based on trending of actual water usage through July 2015.

Table 5-8 through Table 5-14 provides a comparison between supply and demand for normal, single dry and multiple dry water years. As SFPUC supply decreases, groundwater supplies increase, leaving a zero percent difference between supply and demand. Table 5-8 identifies total water sources available to the City in comparison to demand under normal year conditions. It should be noted that the City does not expect to make complete use of each of these water sources. For example, the City's groundwater pumping has ranged between 1,629 to 2,064 acre-feet annually between 2010 and 2014 and is not expected to increase groundwater production beyond 1,000 acre-feet except in multiple dry year conditions per the 2010 UWMP.

Table 5-8 Supply and Demand Comparison – Normal Year and Total Water Sources Available (AFY)

Source	2020	2025	2030	2035
SFPUC ^[1]	14,100	14,100	14,100	14,100
SCVWD ^[2]	13,577	13,577	13,577	13,577
Groundwater ^[3]	8,000	8,000	8,000	8,000
Recycled Water ^[4]	1,525	1,650	2,298	2,298
Supply Totals	37,202	37,327	37,975	37,975
Demand Totals	23,095	24,813	27,211	30,701
Difference	+14,107	+12,541	+10,764	+7,274

[1] The City's SFPUC contract provides for up to 14,100 acre-feet.

[2] The City obtains water from SCVWD through a 3-year requested delivery. The City has obtained a maximum of 13,577 AFY from SCVWD.

[3] City's maximum groundwater production is 8,000 acre-feet.

[4] Based on Table 4-6 of the 2010 UWMP.

Table 5-9Supply and Demand Comparison - Single Dry Year (AFY)

Source	2020	2025	2030	2035
SFPUC	10,003	10,003	10,003	10,003
SCVWD ^[1]	4,793	5,957	7,630	10,248
Groundwater ^[2]	1,000	1,000	1,000	1,000
Recycled Water	1,525	1,650	1,775	1,775
Supply Totals	17,321	18,610	20,408	23,026
Demand Totals	17,321	18,610	20,408	23,026
Difference	0	0	0	0

[1] The City obtains water from SCVWD through a 3-year requested delivery. The City has obtained a maximum of 13,577 AFY from SCVWD.

Table 5-10

Supply and Demand Comparison - Multiple Dry Year for 2016 (AFY)

Source	Year 1 2016	Year 2 2017	Year 3 2018
SFPUC	9,818	9,818	9,818
SCVWD	4,597	4,714	4,831
Ground Water	150	150	150
Recycled Water ^[2]	1,400	1,425	1,450
Supply Totals	15,965	16,107	16,249
Demand Totals	15,965	16,107	16,249
Difference	0	0	0

[1] If the existing drought were to continue for an additional three years, it is assumed that the City's current aggressive conservation measures would be maintained, and further reductions would not be necessary.

[2] Assumes City's current project at WWTP is completed and plant is producing recycled water.

Table 5-11 Supply and Demand Comparison - Multiple Dry Year for 2020 (AFY)

Source	Year 1 2020	Year 2 2021	Year 3 2022
SFPUC	10,003	9,818	9,818
SCVWD	7,629	8,186	6,579
Ground Water	150	150	150
Recycled Water	1,525	1,550	1,575
Supply Totals	19,307	19,704	18,122
Demand Totals	19,307	19,704	18,122
Difference	0	0	0

Table 5-12

Supply and Demand Comparison - Multiple Dry Year for 2025 (AFY)

Source	Year 1 2025	Year 2 2026	Year 3 2027
SFPUC	10,003	9,818	9,818
SCVWD	8,941	9,520	7,789
Ground Water	150	150	150
Recycled Water	1,650	1,675	1,700
Supply Totals	20,744	21,163	19,457
Demand Totals	20,744	21,163	19,457
Difference	0	0	0

Table 5-13

Supply and Demand Comparison - Multiple Dry Year for 2030 (AFY)

Source	Year 1 2030	Year 2 2032	Year 3 2032
SFPUC	10,003	9,818	9,818
SCVWD	10,820	11,456	9,577
Ground Water	150	150	150
Recycled Water	1,775	1,775	1,775
Supply Totals	22,748	23,199	21,320
Demand Totals	22,748	23,199	21,320
Difference	0	0	0

Table 5-14

Supply and Demand Comparison - Multiple Dry Year for 2035 (AFY)

Source	Year 1 2035	Year 2 2036	Year 3 2037
SFPUC	10,003	9,818	9,818
SCVWD	11,296	11,940	10,020
Ground Water	150	150	150
Recycled Water	1,775	1,775	1,775
Supply Totals	23,224	23,683	21,763
Demand Totals	23,224	23,683	21,763
Difference	0	0	0

For each of the five-year increments presented above, the three-year dry period indicates that supplies will be able to meet demands through increased imported water supply from SCVWD and implementation of drought conservation programs. The City will be able to address the projected demands without rationing. This multiple dry year analysis also does not factor increased recycled water production of 2,298 acre-feet that would come on-line by the year 2030.

5.5 WATER QUALITY IMPACTS ON RELIABILITY

As described previously, the City has three sources that supply its potable water. These are the treated surface water from SCVWD and SFPUC and local groundwater. SCVWD provides approximately 47% of Sunnyvale's annual potable water, SFPUC provides approximately 40%, Sunnyvale owned- and operated-wells provide 6% and the remaining 7% comes from recycled water.

5.5.1. SFPUC

SFPUC aggressively protects the natural water resources entrusted to its care. Its annual Hetch Hetchy Watershed survey evaluates the sanitary conditions, water quality, potential contamination sources, and the results of watershed management activities by the SFPUC and its partner agencies, including the National Park Service, to reduce or eliminate contamination sources. SFPUC also conducts sanitary surveys of the local Alameda and Peninsula watersheds every five years. These surveys identified wildlife and human activity as potential contamination sources. The regional system currently meets or exceeds existing water quality standards. However, system upgrades are needed to improve SFPUC's ability to maintain compliance with current water quality standards and to meet anticipated future water quality standards.

5.5.2. SCVWD

Treatment of surface water is necessary to ensure that the water SCVWD provides meets or exceeds all federal and state drinking water standards. Surface water quality programs include: treating local and imported surface water for sale to retailers; participating in regional and statewide coalitions to safeguard source water quality protection; and investigating opportunities for water quality improvements through partnership in regional facilities or exchanges.

SCVWD's source waters are susceptible to potential contamination from sea water intrusion and organic matter in the Delta and from a variety of land use practices, such as agricultural and urban runoff, recreational activities, livestock grazing, and residential and industrial development. Local sources are also vulnerable to potential contamination from commercial stables and historic mining practices. No contaminant associated with any of these activities has been detected in the treated water. The water treatment plants provide multiple barriers for physical removal and disinfection of contaminants. Additionally, SCVWD monitors surface water quality in local reservoirs and in the Sacramento-San Joaquin Delta.

5.5.3. Groundwater

SCVWD monitors groundwater quality to assess current conditions and identify trends or areas of special concern. Wells are monitored for major ions, such as calcium and sodium, nutrients such as nitrate, and trace elements such as iron. Wells are also monitored for man-made

contaminants, such as organic solvents. The type and frequency of monitoring depends on the well location, historic and current land use, and the availability of groundwater data in the area. Overall groundwater quality in Santa Clara County is good. The most notable exceptions are nitrate and perchlorate, which have impacted groundwater quality in the Llagas Subbasin.

As the groundwater management agency in Santa Clara County, SCVWD has ongoing groundwater protection programs to ensure high water quality and more reliable water supplies. These programs include well permitting, well destruction, wellhead protection, land use and development review, nitrate management (targeted to areas of elevated nitrate in the Coyote Subarea and the Llagas Subbasin), saltwater intrusion programs, and providing technical assistance to regulatory agencies to ensure local groundwater resources are protected.

5.5.3.1 Sunnyvale Groundwater Water Quality

Nitrate in the environment comes from both natural and anthropogenic sources. Small amounts of nitrate in groundwater (less than 10 mg/L) are normal, but higher concentrations suggest an anthropogenic origin. Common anthropogenic sources of nitrate in groundwater are fertilizers, septic systems, and animal waste. The drinking water maximum contaminant level (MCL) for nitrate is 45 mg/L as nitrate. Since the Santa Clara Valley has a long history of agricultural production and septic systems are still in use in the unincorporated areas of the county, monitoring for nitrate contamination is an essential groundwater management function in this valley.

Sunnyvale has observed nitrate in excess of 50% of the MCL and conducts monitoring for nitrate more often than is required by regulation.

6.0 CONCLUSION

The City of Sunnyvale optimizes its water resource supply through an integrated resource approach, utilizing available water programs and projects. The City receives its water supplies from groundwater, imported water, and recycled water.

The WSA includes a discussion of the Senate Bill 610 legislation, an overview of the proposed LUTE, and analysis of water demands for the City's existing service the proposed changes to City development projects over the UWMP planning horizon. The WSA also includes an analysis of reliability of the City's water supplies and water quality, and concludes with a sufficiency analysis of water supply during normal, single-dry, and multiple dry years for the next 20 years and build out.

The WSA does not evaluate the adequacy of the City's infrastructure to handle the available water supplies nor does it make any recommendations with respect to capital improvements that may be necessary in order to provide an adequate level of service to the proposed development projects.

This WSA identifies a program of options to provide sufficient water supply for the LUTE over a 20-year planning period as well as build out.

The proposed LUTE includes changes to several growth areas within the City that were previously identified in the adopted General Plan. In total, the growth areas will increase the I/O/C square footage by 4,362,600 SF and increase the total number of residential units by 5,525 units within the City limits over the current LUTE.

The City obtains water from the following primary water sources: groundwater produced via City wells, imported water via SFPUC and SCVWD, and recycled water. The City currently receives approximately 8 percent of its water supply from groundwater, 42 percent from SFPUC, 43 percent from SCVWD, and 7 percent from recycled water.

The build-out of the Project is expected increase of City water demands by 2,274 AFY.

The information included in this Water Supply Assessment identifies programs and activities that collectively represent reasonable opportunities to ensure an adequate supply of water for the City, inclusive of the subject Project, now and into the future.

APPENDIX F – ENERGY DATA

Land Use and Transportation Element Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Office Park	4,166.67	1000sqft	95.65	4,166,667.00	0
Manufacturing	4,166.67	1000sqft	95.65	4,166,667.00	0
Condo/Townhouse	15,100.00	Dwelling Unit	943.75	15,100,000.00	27445
Strip Mall	4,166.67	1000sqft	95.65	4,166,667.00	0

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	58
Climate Zone	4			Operational Year	2035
Utility Company	Pacific Gas & Electric Con	mpany			
CO2 Intensity (Ib/MWhr)	221.7	CH4 Intensity (Ib/MWhr)	0.029	N2O Intensity (Ib/MWhr)	0.006
1.3 User Entere	ed Comments & No	on-Default Data			
Project Character	istics - PG&E 2030 C	O2 Intensity Factor			
Land Use - Estima	ated Likely Developme	ent			
Construction Phas	se - No construction th	nis model			
Vehicle Trips - Tri	p generation and vehi	le miles traveled per	traffic impact analysis		
Woodstoves - Wo	od burning devices p	rohibited in Sunnyvale	9		

Solid Waste -

Mobile Land Use Mitigation -

Energy Mitigation -

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	6,000.00	50.00
tblFireplaces	FireplaceWoodMass	92.40	0.00
tblFireplaces	NumberNoFireplace	4,681.00	6,795.00
tblFireplaces	NumberWood	2,114.00	0.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	LandUseSquareFeet	4,166,670.00	4,166,667.00
tblLandUse	Population	43,186.00	27,445.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	221.7
tblProjectCharacteristics	OperationalYear	2014	2035
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	CW_TL	9.50	7.30
tblVehicleTrips	HO_TL	5.40	5.80
tblVehicleTrips	HS_TL	4.30	5.81
tblVehicleTrips	HW_TL	12.40	5.79
tblVehicleTrips	ST_TR	7.16	6.59
tblVehicleTrips	ST_TR	1.49	3.82
tblVehicleTrips	ST_TR	1.64	3.45
tblVehicleTrips	ST_TR	42.04	13.77
tblVehicleTrips	SU_TR	6.07	6.59
tblVehicleTrips	SU_TR	0.62	3.82
tblVehicleTrips	SU_TR	0.76	3.45
tblVehicleTrips	SU_TR	20.43	13.77
tblVehicleTrips	WD_TR	11.42	3.45
tblVehicleTrips	WD_TR	44.32	13.77
tblWoodstoves	NumberCatalytic	75.50	0.00
tblWoodstoves	NumberNoncatalytic	75.50	0.00
tblWoodstoves	WoodstoveWoodMass	954.80	0.00

2.0 Emissions Summary

2.1 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category		tons/yr											MT	/yr		
Area											0.0000	582.6348	582.6348	0.1826	7.3200e- 003	588.7380
Energy											0.0000	51,602.04 99	51,602.049 9	3.7042	1.1584	52,038.931 3
Mobile											0.0000	114,474.2 897	114,474.28 97	3.0111	0.0000	114,537.52 19
Waste											4,133.438 0	0.0000	4,133.4380	244.2792	0.0000	9,263.3009
Water											950.6708	2,075.177 5	3,025.8483	97.9145	2.3617	5,814.1867
Total											5,084.108 8	168,734.1 519	173,818.26 07	349.0915	3.5274	182,242.67 88

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category		tons/yr											MT	/yr		
Area											0.0000	582.6348	582.6348	0.1826	7.3200e- 003	588.7380
Energy											0.0000	47,164.75 21	47,164.752 1	3.5157	1.0689	47,569.947 1
Mobile											0.0000	114,474.2 897	114,474.28 97	3.0111	0.0000	114,537.52 19
Waste											4,133.438 0	0.0000	4,133.4380	244.2792	0.0000	9,263.3009
Water											760.5367	1,721.946 2	2,482.4829	78.3254	1.8881	4,712.6285
Total											4,893.974 7	163,943.6 228	168,837.59 74	329.3139	2.9643	176,672.13 65

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.74	2.84	2.87	5.67	15.96	3.06

3.0 Operational Detail - Mobile

3.1 Mitigation Measures Mobile

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							МТ	/yr		
Mitigated											0.0000	114,474.2 897	114,474.28 97	3.0111	0.0000	114,537.52 19
Unmitigated											0.0000	114,474.2 897	114,474.28 97	3.0111	0.0000	114,537.52 19

3.2 Trip Summary Information

	Aver	age Daily Trip Ra	ate	Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	99,509.00	99,509.00	99509.00	186,567,326	186,567,326
Manufacturing	15,916.68	15,916.68	15916.68	39,456,350	39,456,350
Office Park	14,375.01	14,375.01	14375.01	32,769,866	32,769,866
Strip Mall	57,375.05	57,375.05	57375.05	84,164,602	84,164,602
Total	187,175.74	187,175.74	187,175.74	342,958,144	342,958,144

3.3 Trip Type Information

		Miles			Trip %		Trip Purpose %				
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by		
Condo/Townhouse	5.79	5.81	5.80	26.10	29.10	44.80	86	11	3		
Manufacturing	7.30	7.30	7.30	59.00	28.00	13.00	92	5	3		
Office Park	7.30	7.30	7.30	33.00	48.00	19.00	82	15	3		
Strip Mall	7.30	7.30	7.30	16.60	64.40	19.00	45	40	15		

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.550618	0.058834	0.183192	0.119400	0.029455	0.004461	0.013811	0.028739	0.001904	0.001198	0.006279	0.000407	0.001702

4.0 Energy Detail

Historical Energy Use: N

4.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Category	tons/yr											MT/yr					
Electricity Mitigated											0.0000	23,393.78 68	23,393.786 8	3.0601	0.6331	23,654.315 7	
Electricity Unmitigated											0.0000	24,320.69 44	24,320.694 4	3.1813	0.6582	24,591.546 0	
NaturalGas Mitigated											0.0000	23,770.96 53	23,770.965 3	0.4556	0.4358	23,915.631 4	
NaturalGas Unmitigated											0.0000	27,281.35 55	27,281.355 5	0.5229	0.5002	27,447.385 3	

4.2 Energy by Land Use - NaturalGas

<u>Unmitigated</u>

	NaturalGa s Use	ROG	NOx	со	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Land Use	kBTU/yr	tons/yr										MT/yr						
Condo/Townhouse	2.94067e+ 008											0.0000	15,692.514 2	15,692.51 42	0.3008	0.2877	15,788.016 3	
Manufacturing	1.14208e+ 008											0.0000	6,094.5921	6,094.592 1	0.1168	0.1117	6,131.6828	
Office Park	9.25833e+ 007											0.0000	4,940.5996	4,940.599 6	0.0947	0.0906	4,970.6673	
Strip Mall	1.0375e+0 07											0.0000	553.6496	553.6496	0.0106	0.0102	557.0190	
Total												0.0000	27,281.355 5	27,281.35 55	0.5229	0.5002	27,447.385 3	

Mitigated

	NaturalGa s Use	ROG	NOx	со	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Land Use	kBTU/yr		tons/yr										MT/yr					
Condo/Townhouse	2.56641e+ 008											0.0000	13,695.321 6	13,695.32 16	0.2625	0.2511	13,778.669 0	
Manufacturing	1.01246e+ 008											0.0000	5,402.8637	5,402.863 7	0.1036	0.0991	5,435.7446	
Office Park	7.87458e+ 007											0.0000	4,202.1779	4,202.177 9	0.0805	0.0770	4,227.7516	
Strip Mall	8.81875e+ 006											0.0000	470.6021	470.6021	9.0200e- 003	8.6300e- 003	473.4661	
Total												0.0000	23,770.965 3	23,770.96 53	0.4556	0.4358	23,915.631 4	

4.3 Energy by Land Use - Electricity

<u>Unmitigated</u>

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr		MT	⁻/yr	
Condo/Townhouse	6.50991e+ 007	6,546.4605	0.8563	0.1772	6,619.366 3
Manufacturing	3.7625e+0 07	3,783.6241	0.4949	0.1024	3,825.761 0
Office Park	9.04167e+ 007	9,092.4299	1.1894	0.2461	9,193.689 3
Strip Mall	4.87083e+ 007	4,898.1800	0.6407	0.1326	4,952.729 4
Total		24,320.694 4	3.1813	0.6582	24,591.54 60
	Electricity Use	Total CO2	CH4	N2O	CO2e
-----------------	--------------------	-----------------	--------	--------	-----------------
Land Use	kWh/yr		MT	ī/yr	
Condo/Townhouse	6.46818e+ 007	6,504.4936	0.8508	0.1760	6,576.932 0
Manufacturing	3.64938e+ 007	3,669.8639	0.4801	0.0993	3,710.734 0
Office Park	8.48542e+ 007	8,533.0569	1.1162	0.2309	8,628.086 7
Strip Mall	4.66021e+ 007	4,686.3724	0.6130	0.1268	4,738.563 0
Total		23,393.786 8	3.0601	0.6331	23,654.31 57

5.0 Area Detail

5.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category					ton	s/yr							MT	/yr		
Mitigated											0.0000	582.6348	582.6348	0.1826	7.3200e- 003	588.7380
Unmitigated											0.0000	582.6348	582.6348	0.1826	7.3200e- 003	588.7380

5.2 Area by SubCategory

Unmitigated

	ROG	NOx	СО	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT	7/yr				
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											0.0000	399.2667	399.2667	7.6500e- 003	7.3200e- 003	401.6965
Landscaping											0.0000	183.3682	183.3682	0.1749	0.0000	187.0414
Total											0.0000	582.6348	582.6348	0.1826	7.3200e- 003	588.7380

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory		tons/yr										MT	/yr			
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											0.0000	399.2667	399.2667	7.6500e- 003	7.3200e- 003	401.6965
Landscaping											0.0000	183.3682	183.3682	0.1749	0.0000	187.0414
Total											0.0000	582.6348	582.6348	0.1826	7.3200e- 003	588.7380

6.0 Water Detail

6.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet Install Low Flow Kitchen Faucet Install Low Flow Toilet Install Low Flow Shower Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category		MT,	/yr	
Mitigated	2,482.4829	78.3254	1.8881	4,712.6285
Unmitigated	3,025.8483	97.9145	2.3617	5,814.1867

6.2 Water by Land Use

Unmitigated

	Indoor/Out door Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal		MT	⁻/yr	
Condo/Townhouse	983.826 / 620.238	1,065.7615	32.1566	0.7774	1,982.029 1
Manufacturing	963.542 / 0	829.9875	31.4656	0.7555	1,724.983 6
Office Park	740.558 / 453.89	797.6640	24.2047	0.5850	1,487.317 7
Strip Mall	308.636 / 189.164	332.4354	10.0876	0.2438	619.8562
Total		3,025.8483	97.9145	2.3617	5,814.186 7

Mitigated

	Indoor/Out door Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal		MT	ī/yr	
Condo/Townhouse	787.061 / 582.403	882.9532	25.7245	0.6217	1,615.906 9
Manufacturing	770.834 / 0	663.9900	25.1679	0.6035	1,379.596 7
Office Park	592.446 / 426.203	660.3369	19.3631	0.4679	1,212.007 3
Strip Mall	246.909 / 177.625	275.2028	8.0698	0.1950	505.1176
Total		2,482.4829	78.3254	1.8881	4,712.628 5

7.0 Waste Detail

7.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
		MT,	/yr	
Unmitigated	4,133.4380	244.2792	0.0000	9,263.3009
Mitigated	4,133.4380	244.2792	0.0000	9,263.3009

7.2 Waste by Land Use

<u>Unmitigated</u>

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons		MT	ī/yr	
Condo/Townhouse	6946	1,409.9752	83.3272	0.0000	3,159.845 4
Manufacturing	5166.67	1,048.7873	61.9816	0.0000	2,350.400 0
Office Park	3875	786.5900	46.4861	0.0000	1,762.798 8
Strip Mall	4375	888.0855	52.4844	0.0000	1,990.256 8
Total		4,133.4380	244.2792	0.0000	9,263.300 9

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons		MT	/yr	
Condo/Townhouse	6946	1,409.9752	83.3272	0.0000	3,159.845 4
Manufacturing	5166.67	1,048.7873	61.9816	0.0000	2,350.400 0
Office Park	3875	786.5900	46.4861	0.0000	1,762.798 8
Strip Mall	4375	888.0855	52.4844	0.0000	1,990.256 8
Total		4,133.4380	244.2792	0.0000	9,263.300 9

Proposed LUTE Increase in Average Daily Fuel Consumption

Sub-Area	Year	Season	Veh_Tech	EMFAC2007 Category	VMT	Fuel_GAS	Fuel_DSL
Santa Clara (SF)	2035	Annual	All Vehicles	All Vehicles	939,621.2	43.8	0.4074
						43,800	407

LUTE Projected Increase in Daily Fuel 44,207 Gallons

Santa Clara County Average Daily Fuel Consumption 2015 and 2035

Year	Season	Sub Area	Vehicle Class	Pollutant	Gallons (000)
2015	Annual	Santa Clara (SF)	LDA	Fuel	978.906
2015	Annual	Santa Clara (SF)	LDT1	Fuel	88.025
2015	Annual	Santa Clara (SF)	LDT2	Fuel	442.054
2015	Annual	Santa Clara (SF)	LHD1	Fuel	75.032
2015	Annual	Santa Clara (SF)	LHD2	Fuel	18.428
2015	Annual	Santa Clara (SF)	MCY	Fuel	6.465
2015	Annual	Santa Clara (SF)	MDV	Fuel	341.969
2015	Annual	Santa Clara (SF)	MH	Fuel	6.098
2015	Annual	Santa Clara (SF)	T6 Ag	Fuel	0.299
2015	Annual	Santa Clara (SF)	T6 CAIRP Heavy	Fuel	0.088
2015	Annual	Santa Clara (SF)	T6 CAIRP Small	Fuel	0.273
2015	Annual	Santa Clara (SF)	T6 Instate Construction Heavy	Fuel	2.026
2015	Annual	Santa Clara (SF)	T6 Instate Construction Small	Fuel	4.761
2015	Annual	Santa Clara (SF)	T6 Instate Heavy	Fuel	14.452
2015	Annual	Santa Clara (SF)	T6 Instate Small	Fuel	34.865
2015	Annual	Santa Clara (SF)	T6 OOS Heavy	Fuel	0.051
2015	Annual	Santa Clara (SF)	T6 OOS Small	Fuel	0.156
2015	Annual	Santa Clara (SF)	T6 Public	Fuel	1.489
2015	Annual	Santa Clara (SF)	T6 Utility	Fuel	0.267
2015	Annual	Santa Clara (SF)	T6TS	Fuel	10.567
2015	Annual	Santa Clara (SF)	T7 Ag	Fuel	0.389
2015	Annual	Santa Clara (SF)	T7 CAIRP	Fuel	22.859
2015	Annual	Santa Clara (SF)	T7 CAIRP Construction	Fuel	2.154
2015	Annual	Santa Clara (SF)	T7 NNOOS	Fuel	27.526
2015	Annual	Santa Clara (SF)	T7 NOOS	Fuel	9.198
2015	Annual	Santa Clara (SF)	T7 Other Port	Fuel	2.382
2015	Annual	Santa Clara (SF)	Τ7 ΡΟΑΚ	Fuel	9.016
2015	Annual	Santa Clara (SF)	T7 Public	Fuel	2.517
2015	Annual	Santa Clara (SF)	T7 Single	Fuel	13.121
2015	Annual	Santa Clara (SF)	T7 Single Construction	Fuel	5.338
2015	Annual	Santa Clara (SF)	T7 SWCV	Fuel	10.199

Santa Clara County Average Daily Fuel Consumption 2015 and 2035

2015	Annual	Santa Clara (SF)	T7 Tractor	Fuel	40.060
2015	Annual	Santa Clara (SF)	T7 Tractor Construction	Fuel	4.001
2015	Annual	Santa Clara (SF)	T7 Utility	Fuel	0.256
2015	Annual	Santa Clara (SF)	T7IS	Fuel	1.949
2015	Annual	Santa Clara (SF)	РТО	Fuel	3.257
2015	Annual	Santa Clara (SF)	SBUS	Fuel	3.194
2015	Annual	Santa Clara (SF)	UBUS	Fuel	18.175
2015	Annual	Santa Clara (SF)	Motor Coach	Fuel	2.467
2015	Annual	Santa Clara (SF)	OBUS	Fuel	6.117
2015	Annual	Santa Clara (SF)	All Other Buses	Fuel	3.973
		Year 2015 Average Daily Fuel Consumption			2214.420

2,214,420 Gallons Daily

Annual	Santa Clara (SF)	LDA	Fuel	663.960
Annual	Santa Clara (SF)	LDT1	Fuel	46.000
Annual	Santa Clara (SF)	LDT2	Fuel	240.722
Annual	Santa Clara (SF)	LHD1	Fuel	40.847
Annual	Santa Clara (SF)	LHD2	Fuel	19.388
Annual	Santa Clara (SF)	MCY	Fuel	7.106
Annual	Santa Clara (SF)	MDV	Fuel	172.222
Annual	Santa Clara (SF)	MH	Fuel	4.503
Annual	Santa Clara (SF)	T6 Ag	Fuel	0.297
Annual	Santa Clara (SF)	T6 CAIRP Heavy	Fuel	0.126
Annual	Santa Clara (SF)	T6 CAIRP Small	Fuel	0.396
Annual	Santa Clara (SF)	T6 Instate Construction Heavy	Fuel	2.422
Annual	Santa Clara (SF)	T6 Instate Construction Small	Fuel	5.671
Annual	Santa Clara (SF)	T6 Instate Heavy	Fuel	16.471
Annual	Santa Clara (SF)	T6 Instate Small	Fuel	42.448
Annual	Santa Clara (SF)	T6 OOS Heavy	Fuel	0.072
Annual	Santa Clara (SF)	T6 OOS Small	Fuel	0.227
Annual	Santa Clara (SF)	T6 Public	Fuel	1.819
	Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual Annual	AnnualSanta Clara (SF)AnnualSanta Clara (SF)	AnnualSanta Clara (SF)LDAAnnualSanta Clara (SF)LDT1AnnualSanta Clara (SF)LDT2AnnualSanta Clara (SF)LHD1AnnualSanta Clara (SF)LHD2AnnualSanta Clara (SF)MCYAnnualSanta Clara (SF)MDVAnnualSanta Clara (SF)MHAnnualSanta Clara (SF)MHAnnualSanta Clara (SF)T6 AgAnnualSanta Clara (SF)T6 CAIRP HeavyAnnualSanta Clara (SF)T6 CAIRP HeavyAnnualSanta Clara (SF)T6 Instate Construction HeavyAnnualSanta Clara (SF)T6 Instate Construction SmallAnnualSanta Clara (SF)T6 Instate HeavyAnnualSanta Clara (SF)T6 Instate SmallAnnualSanta Clara (SF)T6 Instate SmallAnnualSanta Clara (SF)T6 OOS HeavyAnnualSanta Clara (SF)T6 OOS SmallAnnualSanta Clara (SF)T6 Public	AnnualSanta Clara (SF)LDAFuelAnnualSanta Clara (SF)LDT1FuelAnnualSanta Clara (SF)LDT2FuelAnnualSanta Clara (SF)LHD1FuelAnnualSanta Clara (SF)LHD2FuelAnnualSanta Clara (SF)MCYFuelAnnualSanta Clara (SF)MDVFuelAnnualSanta Clara (SF)MDVFuelAnnualSanta Clara (SF)MHFuelAnnualSanta Clara (SF)T6 AgFuelAnnualSanta Clara (SF)T6 CAIRP HeavyFuelAnnualSanta Clara (SF)T6 Instate Construction HeavyFuelAnnualSanta Clara (SF)T6 Instate Construction SmallFuelAnnualSanta Clara (SF)T6 Instate HeavyFuelAnnualSanta Clara (SF)T6 Instate SmallFuelAnnualSanta Clara (SF)T6 Instate SmallFuelAnnualSanta Clara (SF)T6 Instate SmallFuelAnnualSanta Clara (SF)T6 Instate SmallFuelAnnualSanta Clara (SF)T6 OOS HeavyFuelAnnualSanta Clara (SF)T6 OOS SmallFuelAnnualSanta Clara (SF)T6 PublicFuel

Santa Clara County Average Daily Fuel Consumption 2015 and 2035

2035	Annual	Santa Clara (SF)	T6 Utility	Fuel	0.300	
2035	Annual	Santa Clara (SF)	T6TS	Fuel	14.166	
2035	Annual	Santa Clara (SF)	T7 Ag	Fuel	0.428	
2035	Annual	Santa Clara (SF)	T7 CAIRP	Fuel	29.753	
2035	Annual	Santa Clara (SF)	T7 CAIRP Construction	Fuel	2.323	
2035	Annual	Santa Clara (SF)	T7 NNOOS	Fuel	37.453	
2035	Annual	Santa Clara (SF)	T7 NOOS	Fuel	11.936	
2035	Annual	Santa Clara (SF)	T7 Other Port	Fuel	3.415	
2035	Annual	Santa Clara (SF)	Τ7 ΡΟΑΚ	Fuel	19.261	
2035	Annual	Santa Clara (SF)	T7 Public	Fuel	1.762	
2035	Annual	Santa Clara (SF)	T7 Single	Fuel	10.209	
2035	Annual	Santa Clara (SF)	T7 Single Construction	Fuel	5.843	
2035	Annual	Santa Clara (SF)	T7 SWCV	Fuel	6.626	
2035	Annual	Santa Clara (SF)	T7 Tractor	Fuel	53.909	
2035	Annual	Santa Clara (SF)	T7 Tractor Construction	Fuel	4.343	
2035	Annual	Santa Clara (SF)	T7 Utility	Fuel	0.264	
2035	Annual	Santa Clara (SF)	T7IS	Fuel	2.539	
2035	Annual	Santa Clara (SF)	РТО	Fuel	2.431	
2035	Annual	Santa Clara (SF)	SBUS	Fuel	3.821	
2035	Annual	Santa Clara (SF)	UBUS	Fuel	15.199	
2035	Annual	Santa Clara (SF)	Motor Coach	Fuel	3.402	
2035	Annual	Santa Clara (SF)	OBUS	Fuel	7.650	
2035	Annual	Santa Clara (SF)	All Other Buses	Fuel	5.367	
Year 2035 Average Daily Fuel Consumption						

1,507,094 Gallons Daily