

February 5, 2016 | Public Review Draft EIR



Comprehensive Plan Update Environmental Impact Report

for the City of Palo Alto

Volume 2: Appendices

February 5, 2016
Public Review Draft EIR

Prepared By:

PlaceWorks

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Comprehensive Plan Update Environmental Impact Report

for the City of Palo Alto

Volume 2: Appendices

SCH # 2014052101

In Association With:

Hexagon Transportation Consultants, Inc.

MIG | TRA Environmental Sciences, Inc.

A P P E N D I X A

NOTICE OF PREPARATION (NOP)
& COMMENTS ON THE NOP

.....

Notice of Preparation (NOP) of an Environmental Impact Report (EIR)

Date: May 30, 2014

To: Responsible Agencies and Other Interested Parties	From: City of Palo Alto Dept. of Planning and Community Environment 250 Hamilton Avenue Palo Alto, California 94301
State Clearinghouse P.O. Box 3044 Sacramento, CA 95812-3044	

The City of Palo Alto will be the Lead Agency and will prepare a programmatic Environmental Impact Report (EIR) for the Palo Alto Comprehensive Plan Update project (the Project). The Project, its location, and potential environmental effects are described below. Pursuant to the CEQA Section 15060, the City has determined that an EIR is required for the Project and an Initial Study has not been prepared.

Public agencies and members of the general public are invited to provide comments in writing as to the scope and content of the EIR. Specifically, the City needs to know the views of Responsible and Trustee Agencies as to the significant environmental issues, reasonable alternatives, and mitigation measures that are germane to each agency's statutory responsibilities in connection with the Project. Responsible Agencies will need to use the EIR prepared by the City when considering their permit or other approval for the Project.

Due to the time limits mandated by State law, responses must be sent at the earliest possible date, but no later than the close of the NOP review period, which runs as follows:

- **Public Agencies - May 30 through June 30, 2014**
- **General Public - May 30 through August 6, 2014**

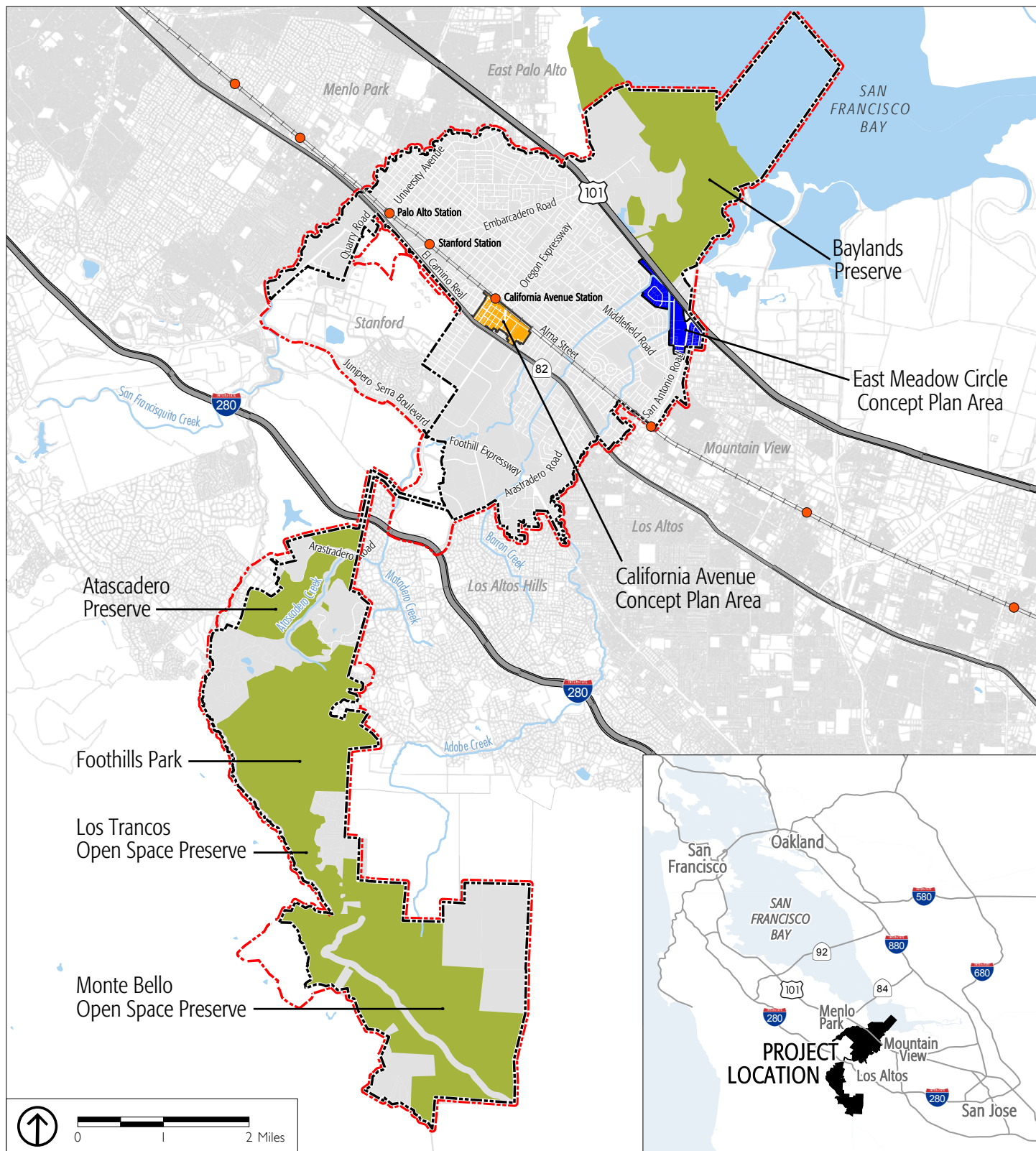
Please send written responses to Elena Lee at the address shown below. Public agencies providing comments are requested to include a contact person for the agency.

1. Project Title: Palo Alto Comprehensive Plan Update

2. Project Location, Existing Land Uses, and Surrounding Uses:

The City of Palo Alto is located in the southeastern portion of the San Francisco Peninsula in Santa Clara County, as shown in Figure 1. Covering an area of 25.8 square miles, Palo Alto shares its borders with the Cities of Menlo Park, East Palo Alto, Mountain View, and Los Altos, as well as the Town of Los Altos Hills, the unincorporated community of Portola Valley, and Stanford University. Regional access to Palo Alto is provided by U.S. Highway 101, Interstate 280, and State Route 82. Additionally, the city is served by the Caltrain passenger rail network.

Palo Alto is a diverse city of neighborhoods, with an engaged community, excellent school and public facilities, and a vibrant economy anchored by the high technology and medical employment sectors. The city is home to a large number of high-tech businesses and institutions engaged in research and development, including Hewlett-Packard, Tesla Motors, Groupon, Xerox, Stanford University, the Palo Alto Medical Foundation, and the Palo Alto Research Park. The developed portion of Palo Alto, known as the Urban Service Area, contains a variety of residential, commercial, office, retail, and industrial land uses.



Source: The Planning Center | DC&E, 2013; The City of Palo Alto, 2013.

FIGURE I
PROJECT LOCATION AND CONTEXT

The City of Palo Alto also contains important areas of natural habitat concentrated primarily in open space areas within the City limits, including Arastradero Preserve, Foothills Park, Los Trancos Open Space Preserve, Baylands preserve, and Byxbee Park. Several creeks pass through the city generally flowing north toward San Francisco Bay. These creeks include Adobe Creek, San Francisquito Creek, Matadero Creek, Arastradero Creek, and Barron Creek.

3. Lead Agency Contact:

Elena Lee, Senior Planner
City of Palo Alto Department of Planning and Community Environment
250 Hamilton Avenue
Palo Alto, CA 94301
Tel. (650) 617-3196
Email: elena.lee@cityofpaloalto.org

4. Project Sponsor:

City of Palo Alto
250 Hamilton Avenue
Palo Alto, CA 94301

5. Project Description:

The Palo Alto Comprehensive Plan is the City's governing document for land use and development decisions. The City is undertaking a Comprehensive Plan Update in order to establish a shared vision for the future of the community through to the year 2030.

The Project will update goals, policies, programs, maps and diagrams throughout the Comprehensive Plan and will also involve preparation of two concept plans to establish a broad vision for the California Avenue/Fry's Site Area and the East Meadow Circle/Fabian Way Area.

The current Palo Alto Comprehensive Plan includes the following elements, which will be maintained and updated as part of the Comprehensive Plan Update:

- **Land Use and Community Design:** this element sets policy regarding the location and concentration of housing, businesses, public facilities, open space and other land uses.
- **Transportation:** this element sets policy regarding existing and planned roads and transit and pedestrian systems in Palo Alto.
- **Natural and Urban Environment and Safety:** this element sets policy regarding open space, water supply, air quality, urban forest, special-status species, hazardous materials, climate change and noise, as well as policies for emergency management and safety.
- **Housing Element:** this chapter sets policy regarding the development of housing opportunities that enhance the character, diversity and vitality of the City. The Housing Element is concurrently being updated on a separate schedule for compliance with State requirements. However, the Comprehensive Plan Update could include some adjustments as needed to maintain internal consistency.
- **Community Services and Facilities:** this element sets policy regarding existing public facilities and planned infrastructure expansions and improvements.
- **Business and Economics:** this element sets policy regarding future business development and industry.

- **Governance:** this chapter sets policy regarding community participation in government, Palo Alto's role in the region, and process management. It will be reframed as a "user's guide" to the Comprehensive Plan that explains how it should be used and how it can be amended in the future.

6. Probable Environmental Effects of the Project:

The EIR will evaluate potentially significant environmental impacts associated with the adoption and implementation of the Comprehensive Plan Update. Consistent with the State CEQA Guidelines (Appendix G), the following environmental resource categories will be analyzed in relation to the Project:

▪ Aesthetics	▪ Hydrology and Water Quality
▪ Agriculture and Forestry Resources	▪ Land Use / Planning
▪ Air Quality	▪ Mineral Resources
▪ Biological Resources	▪ Noise
▪ Cultural Resources	▪ Population and Housing
▪ Geology / Soils	▪ Public Services and Recreation
▪ GHG Emissions	▪ Transportation and Traffic
▪ Hazards and Hazardous Materials	▪ Utilities and Service Systems

All of the resource categories listed above will be considered in the EIR; however, given the scope of the Project and the location of Palo Alto, it is anticipated that resource categories, such as Mineral Resources, for which it can be clearly demonstrated that no significant impacts would result from Project implementation will be addressed briefly and "scoped out."

7. Public Meetings

The City of Palo Alto will conduct a series of five meetings to provide opportunity for public agencies and interested members of the general public to comment on the scope of the Project and proposed EIR. Members of the public and public agencies are invited to participate and provide comments to the City at the meetings listed below.

Meeting #1 Community Meeting - Critical Issues

Date/Time: May 29, 2014/6:00 – 8:00 PM

Location: Avenidas, 450 Bryant Street, Palo Alto, CA 94301

Meeting #2 Community Meeting - Growth Management

Date/Time: June 10, 2014/6:00 – 8:00 PM

Location: Palo Alto High School, English Resource Center, 50 Embarcadero Rd, Palo Alto, CA 94301

Meeting #3 Community Meeting - Alternative Futures

Date/Time: June 24, 2014/6:00 - 8:30 PM

Location: Elk's Lodge, 4249 El Camino Real, Palo Alto, CA 94306

Meeting #4 Planning and Transportation Commission EIR Scoping Hearing

Date/Time: July 9, 2014/6:00 PM

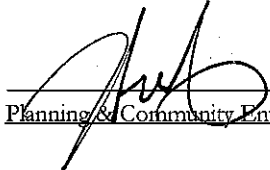
Location: City Hall Council Chambers. 250 Hamilton Ave., Palo Alto, CA 94301

Meeting # 5 City Council Hearing

Date/Time: August 4, 2014/7:00 PM

Location: City Hall Council Chambers. 250 Hamilton Ave., Palo Alto, CA 94301

Date May 30, 2014

Signature 

Title Planning & Community Environment Director

*City of Palo Alto
May 30, 2014*

*Comprehensive Plan Update EIR
Notice of Preparation*



EDMUND G. BROWN JR.
GOVERNOR

STATE OF CALIFORNIA
GOVERNOR'S OFFICE of PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT



KEN ALEX
DIRECTOR

Notice of Preparation

May 30, 2014

To: Reviewing Agencies

Re: Palo Alto Comprehensive Plan Update and EIR
SCH# 2014052101

Attached for your review and comment is the Notice of Preparation (NOP) for the Palo Alto Comprehensive Plan Update and EIR 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 Agency. 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:

Elena Lee
City of Palo Alto
250 Hamilton Avenue, 5th Floor
Palo Alto, CA 94301

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,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

**Document Details Report
State Clearinghouse Data Base**

SCH# 2014052101
Project Title Palo Alto Comprehensive Plan Update and EIR
Lead Agency Palo Alto, City of

Type NOP Notice of Preparation
Description The Palo Alto Comprehensive Plan is the City's governing document for land use and development decisions. The City is undertaking a Comprehensive Plan Update in order to establish a shared vision for the future of the community through to the year 2030.

Lead Agency Contact

Name Elena Lee
Agency City of Palo Alto
Phone 650 329 2441 **Fax**
email
Address 250 Hamilton Avenue, 5th Floor
City Palo Alto **State** CA **Zip** 94301

Project Location

County Santa Clara
City Palo Alto
Region
Cross Streets Citywide
Lat / Long 37.42° N / 122° W
Parcel No. Various
Township

Range

Section

Base

Proximity to:

Highways I-280 and US 101
Airports Palo Alto
Railways Caltrain
Waterways
Schools
Land Use Various

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Coastal Zone; Drainage/Absorption; Economics/Jobs; Fiscal Impacts; Flood Plain/Flooding; Forest Land/Fire Hazard; 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; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects; Other Issues

Reviewing Agencies Resources Agency; Department of Conservation; Cal Fire; Department of Parks and Recreation; San Francisco Bay Conservation and Development Commission; Department of Fish and Wildlife, Region 3; Office of Emergency Services, California; Native American Heritage Commission; Public Utilities Commission; Caltrans, Division of Aeronautics; California Highway Patrol; Department of Housing and Community Development; Caltrans, District 4; Air Resources Board; Regional Water Quality Control Board, Region 2

Date Received 05/30/2014 **Start of Review** 05/30/2014 **End of Review** 06/30/2014

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
 For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Palo Alto Comprehensive Plan Update and EIR**Lead Agency:** City of Palo Alto, Dept. Planning & Community Environment**Contact Person:** Elena Lee, Senior Planner**Mailing Address:** 250 Hamilton Ave, 5th Floor**Phone:** 650-329-2441**City:** Palo Alto**Zip:** 94301**County:** Santa Clara**Project Location:** County: Santa ClaraCity/Nearest Community: Palo Alto**Cross Streets:** Citywide**Zip Code:** multiple**Longitude/Latitude (degrees, minutes and seconds):** 37.42° ' " N / 122° ' " W **Total Acres:** 16,506.6**Assessor's Parcel No.:** Various**Section:** _____**Twp.:** _____**Range:** _____**Base:** _____**Within 2 Miles:** State Hwy #: I-280 and US 101**Waterways:** _____**Airports:** Palo Alto**Railways:** Caltrain**Schools:** _____**Document Type:****CEQA:** ☒ NOP☐ Draft EIR**NEPA:** ☐ NOI**Other:** ☐ Joint Document☐ Early Cons☐ Supplement/Subsequent EIR☐ EA☐ Final Document☐ Neg Dec☐ (Prior SCH No.)☐ Draft EIS☐ Other: _____☐ Mit Neg Dec**Other:** _____**Local Action Type:**☒ General Plan Update☐ Specific Plan☐ Rezone☐ Annexation☐ General Plan Amendment☐ Master Plan☐ Prezone☐ Redevelopment☐ General Plan Element☐ Planned Unit Development☐ Use Permit☐ Coastal Permit☐ Community Plan☐ Site Plan☐ Land Division (Subdivision, etc.)**Other:** _____**Development Type:**☐ Residential: Units _____ Acres _____

☐ Office: Sq.ft. _____ Acres _____

Employees _____☐ Transportation: Type _____☐ Commercial: Sq.ft. _____ Acres _____

Employees _____☐ Mining: Mineral _____☐ Industrial: Sq.ft. _____ Acres _____

Employees _____☐ Power: Type _____

MW

☐ Educational:☐ Waste Treatment: Type _____

MGD

☐ Recreational:☐ Hazardous Waste: Type _____☐ Water Facilities: Type _____

MGD

☐ Other: _____**Project Issues Discussed in Document:**☒ Aesthetic/Visual☒ Fiscal☒ Recreation/Parks☒ Vegetation☒ Agricultural Land☒ Flood Plain/Flooding☒ Schools/Universities☒ Water Quality☒ Air Quality☒ Forest Land/Fire Hazard☒ Septic Systems☒ Water Supply/Groundwater☒ Archeological/Historical☒ Geologic/Seismic☒ Sewer Capacity☒ Wetland/Riparian☒ Biological Resources☒ Minerals☒ Soil Erosion/Compaction/Grading☒ Growth Inducement☒ Coastal Zone☒ Noise☒ Solid Waste☒ Land Use☒ Drainage/Absorption☒ Population/Housing Balance☒ Toxic/Hazardous☒ Cumulative Effects☒ Economic/Jobs☒ Public Services/Facilities☒ Traffic/Circulation☒ Other: GHG**Present Land Use/Zoning/General Plan Designation:**Various**Project Description:** (please use a separate page if necessary)

Please see attached NOP

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY

EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION

DISTRICT 4

P.O. BOX 23660

OAKLAND, CA 94623-0660

PHONE (510) 286-6053

FAX (510) 286-5559

TTY 711

www.dot.ca.gov

*Serious Drought.
Help save water!*

June 26, 2014

SCLGEN117
SCH# 2014052101

Ms. Elena Lee
Planning Department
City of Palo Alto
250 Hamilton Avenue, 6th Floor
Palo Alto, CA 94301

Dear Ms. Lee:

Palo Alto Comprehensive Plan Update – Notice of Preparation (NOP)

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the project referenced above. We have reviewed the NOP and have the following comments to offer.

Lead Agency

As the lead agency, the City of Palo Alto (City) 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.

Vehicle Trip Reduction

Caltrans encourages the City 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 promote 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. In addition, please ensure secondary impacts on pedestrians and bicyclists resulting from any traffic impact mitigation measures are analyzed. The analysis should describe any pedestrian and bicycle mitigation measures and safety countermeasures that would in turn be needed as a means

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

Ms. Elena Lee/City of Palo Alto
June 26, 2014
Page 2

of maintaining and improving access to transit facilities and reducing vehicle trips and traffic impacts on State highways.

Traffic Impact Fees

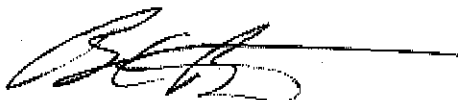
Please identify traffic impact fees to be used for project mitigation. Development plans should require traffic impact fees based on projected traffic and/or based on associated cost estimates for public transportation facilities necessitated by development. Scheduling and costs associated with planned improvements on State ROW should be listed, in addition to identifying viable funding sources correlated to the pace of improvements for roadway improvements, if any.

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 Caltrans. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW must be submitted to: David Salladay, District Office Chief, 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 prior to the encroachment permit process. See this website for more information:
<http://www.dot.ca.gov/hq/traffops/developserv/permits>.

Should you have any questions regarding this letter, please contact Brian Brandert of my staff at (510) 286-5505 or brian.brandert@dot.ca.gov.

Sincerely,



for

ERIK ALM, AICP
District Branch Chief
Local Development - Intergovernmental Review

c: Scott Morgan, State Clearinghouse



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

June 30, 2014

Elena Lee
Department of Planning and Community Environment
250 Hamilton Avenue
Palo Alto, CA 94301

Subject: Notice of Preparation of a Draft Environmental Impact Report for the
Palo Alto Comprehensive Plan Update

Dear Ms. Elena Lee:

Bay Area Air Quality Management District (Air District) staff reviewed the Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the City of Palo Alto's (City) Comprehensive Plan Update (Project). We understand that the Project will update goals and policies for future development within the City, and will also involve preparation of two concept plans to establish a broad vision for the California Fry's Site Area and the East Meadow Circle/Fabian Way Area.

Air District staff has the following specific comments on the environmental analysis that should be included in the DEIR:

1. The DEIR should provide a detailed analysis of the Project's potential effects on local and regional air quality impacts. The Air District's *CEQA Air Quality Guidelines (May, 2012)* provide guidance on how to evaluate a project's construction, operational and cumulative air quality impacts. A copy may be downloaded from:
<http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES.aspx>.
2. The DEIR should include a discussion on the Air District's attainment status for all criteria pollutants and the implications for the region if these standards are not attained or maintained by statutory deadlines; a discussion of the health effects of air pollution; and a discussion of greenhouse gas (GHG) emissions and the potential impacts from climate change in the Bay Area.
3. The DEIR should provide a map that clearly identifies the Project's boundary; existing and future planned sensitive receptors (e.g., residences, schools, day cares, hospitals, and nursing care facilities) and all stationary sources, highways, major roadways, and rail lines within 1,000 feet of the Project's boundary.

ALAMEDA COUNTY

Tom Bates
Margaret Fujioka
Scott Haggerty
Nate Miley
(Chair)

CONTRA COSTA COUNTY

John Gioia
David Hudson
Mary Piepho
Mark Ross

MARIN COUNTY

Susan Adams

NAPA COUNTY

Brad Wagenknecht

SAN FRANCISCO COUNTY

John Avalos
Edwin M. Lee
Eric Mar
(Secretary)

SAN MATEO COUNTY

Carole Groom
(Vice-Chair)
Carol Klatt

SANTA CLARA COUNTY

Cindy Chavez
Ash Kalra
Liz Kniss
Jan Pepper

SOLANO COUNTY

James Sperling

SONOMA COUNTY

Teresa Barrett
Shirlee Zane

Jack P. Broadbent
EXECUTIVE OFFICER/APCO

4. The DEIR should estimate and evaluate the potential health risk to existing and future sensitive populations within the Project area from toxic air contaminants (TACs) as a result of Project construction and operation. Air District staff recommends that the DEIR evaluate potential impacts of TAC emissions with siting land uses attracting sensitive populations, such as residents, children, and seniors, near major transportation corridors and other sources of TACs.
5. The DEIR should identify and evaluate mitigation measures to reduce criteria pollutants, toxic air contaminants, and GHGs to lesson any potential air quality impacts. The Air District's *CEQA Air Quality Guidelines* can assist in identifying and quantifying mitigation measures.
6. The DEIR should demonstrate its consistency with the Air District's *2010 Clean Air Plan*. The Air District's *2010 Clean Air Plan* may be found on the Air District's website, <http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx>.

If any aspects of the Project require a discretionary permit from the Air District, then the Air District is a responsible agency for CEQA purposes. The Project must obtain the appropriate permits from the Air District and comply with all applicable Air District rules and regulations and permitting requirements. If the Project will require an Air District permit, then the analysis methodology used in the DEIR and all subsequent environmental documents for the proposed Project must be consistent with the Air District's permitting requirements.

The DEIR should include all appendices or technical documents related to the air quality, toxic air contaminant, and GHG analyses, such as emission calculation and health risk assessment files. Without all the supporting air quality documentation, the Air District may be unable to review the air quality analysis in a timely manner.

The Air District's website contains a number of tools and resources to assist lead agencies in analyzing environmental impacts, including: posted CEQA comment letters; guidance on quantifying plan-level GHG emissions; and risk and hazard screening tools and guidance. View and download available tools here: <http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx>.

We encourage lead agencies to contact Air District staff with any questions, and request assistance during the environmental analysis process. If you have any questions regarding these comments, please contact Jackie Winkel, Environmental Planner, 415-749-4933.

Sincerely,

A handwritten signature in black ink, appearing to read 'BBJ' followed by a flourish and the word 'for'.

Jean Roggenkamp

Deputy Air Pollution Control Officer

cc: BAAQMD Director Cindy Chavez
BAAQMD Chair Ash Kalra
BAAQMD Director Liz Kniss
BAAQMD Director Jan Pepper



June 30, 2014

City of Palo Alto
Public Works Department
P.O. Box 10250
Palo Alto, CA 94303

Attention: Elena Lee

Subject: Palo Alto Comprehensive Plan Update

Dear Ms. Lee:

Santa Clara Valley Transportation Authority (VTA) staff have reviewed the NOP for a Draft EIR for an update to the Palo Alto Comprehensive Plan. We have the following comments.

Transportation Analysis

VTA recommends that the City take a multimodal approach to transportation analysis in the DEIR, including meaningful analyses of impacts and mitigation measures for pedestrian, bicycle, and transit modes in addition to automobiles. VTA also recommends the use of other multimodal performance indicators such as non-auto mode shares, transit boardings, and pedestrian and bicycle quality of service measures. VTA recommends that the City consider recently-adopted Senate Bill 743 in selecting performance measures for the DEIR Transportation Analysis, including consideration of the use of Vehicle-Miles-Traveled (VMT) or other broader performance measures.

Transportation Network and Land Use Assumptions

Please clearly state the City's assumptions regarding the future transportation network and future land uses both within and outside the City's borders in the horizon year in the Transportation section of 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 Comprehensive Plan buildout figures for population, households and jobs compare to ABAG's Projections 2013 assumptions both in Palo Alto and in neighboring cities.

Consistency with VTA Travel Demand Model

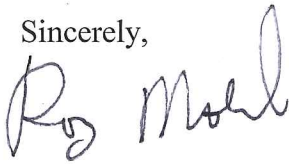
VTA recommends that the City refer to the VTA CMP *Local Transportation Model Consistency Guidelines* prior to developing the Transportation analysis for this DEIR. This document, which includes the local model consistency guidelines and the local model evaluation and acceptance procedure, may be downloaded from <http://www.vta.org/cmp/technical-guidelines>. 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.

Congestion Impacts to Transit Service

The Transportation analysis in the DEIR should address any potential impacts that increased motor vehicle traffic and congestion associated with the Comprehensive Plan build-out may have on transit travel times, particularly in the El Camino Real corridor. If increased transit delay is found in this analysis, the City should work with VTA to identify feasible transit priority measures and include contributions to any applicable projects as mitigation measures in the DEIR. Transit priority measures that improve transit speed and reliability may include queue jump lanes, transit priority signal timing, bulb-out transit stops, and/or dedicated transit lanes.

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

Sincerely,

A handwritten signature in dark ink, appearing to read "Roy Molseed". The signature is fluid and cursive, with the first name "Roy" and last name "Molseed" clearly distinguishable.

Roy Molseed
Senior Environmental Planner



STANFORD UNIVERSITY
LAND USE AND ENVIRONMENTAL PLANNING

VIA HAND DELIVERY

August 4, 2014

Ms. Elena Lee, Senior Planner
City of Palo Alto Department of Planning and Community Environment
250 Hamilton Avenue
Palo Alto, CA 94301

**Re: Comments on Notice of Preparation of Environmental Impact Report
Palo Alto Comprehensive Plan Update**

Dear Ms. Lee:

Thank you for the opportunity to provide Stanford University's comments on the Notice of Preparation for the Palo Alto Comprehensive Plan Update EIR. We believe the alternatives currently described for the Comprehensive Plan Update are not sufficiently defined to enable the City to complete a thorough and accurate environmental review. The EIR analysis of the alternatives that inform a Comprehensive Plan process and decision is critical, and we look forward to working with the City of Palo Alto to arrive at a well-defined range of alternatives for this analysis.

Stanford's lands in the City of Palo Alto are extensive – totaling approximately 1,160 acres – and are used for a wide range of important purposes. A partial list includes:

- Research and Development and Office Uses: The 700-acre Stanford Research Park, comprising approximately 10.3 million square feet of R&D and office space, is the cornerstone of Silicon Valley, an integral component of the City's R&D and technology focus, the City's largest employment center, and a significant sales and use tax producer.
- Residential Uses: Residential uses on Stanford land include the 759-unit Oak Creek Apartments (29 acres), the 628-unit Stanford West Complex (25 acres plus 21 acres of protected open space), and the 494-unit Vi at Palo Alto continuing care retirement community (23 acres). Stanford will soon add 70 units of below-market-rate housing on 1.8 acres and 180 units of faculty housing on 17 acres within the boundaries of the Stanford Research Park.
- Medical Uses: These include two hospitals in the Stanford University Medical Center (66 acres), the Welch Road Medical Offices (14 acres), and the Ronald McDonald House.
- Retail Uses: The Stanford Shopping Center comprises approximately 1.4 million square feet of retail and restaurant uses on 69 acres and is Palo Alto's largest sales tax producer.

- Hotel Uses: The 346-room Sheraton Hotel is on 6.7 acres of Stanford land.
- Recreational Uses: Stanford owns the 10.75-acre El Camino Park site, which is also home to the City's 2.5-million gallon underground water reservoir, as well as the 6-acre site of the Stanford/Palo Alto Community Playing Fields at El Camino Real and Page Mill Road on the edge of the Stanford Research Park.
- 27 University Avenue: This 1.7-acre site includes the adjacent Red Cross, but is best known for currently housing the MacArthur Park Restaurant in a historic Julia Morgan-designed building. Previously this location was identified for a potential change in use.

The goals, policies and programs that the Palo Alto community selects for its Comprehensive Plan Update could have profound effects, both positive and negative, on the City as a whole and on Stanford's contributions to the community. Stanford offers the following comments and suggestions for the EIR's project description and analysis to advance a thorough and meaningful evaluation of the relevant policy and environmental considerations.

The Notice of Preparation of the Comprehensive Plan Update EIR describes the City's proposal only by listing the Comprehensive Plan policies that will be updated. The ways in which the City might in fact change its Comprehensive Plan are discussed in the City Council Staff Report for the August 4 hearing, which lists four alternative scenarios. As explained below, these scenarios are not yet described appropriately to enable an effective, meaningful environmental review.

The Staff Report emphasizes on page 4: **"Staff is seeking Council's direction whether to proceed with the conceptual alternatives' definition at a staff level and begin the EIR analysis, or whether to return to Council with specific information for further discussion prior to beginning the EIR analysis."** As described below, Stanford respectfully maintains that only the Council can make the critical policy decisions necessary to define the conceptual alternatives to the degree needed to begin the environmental review. We therefore believe the Council should instruct staff to return to Council with specific information for further discussion before beginning the EIR.

We believe the EIR should:

- Analyze appropriately defined alternatives that reflect a reasonable range of Comprehensive Plan options;
- Analyze an alternative that responsibly plans to accommodate the City's share of projected regional job and housing growth through 2030 and does not artificially depress such growth through annual caps or unrealistic net-zero concepts; and

- Analyze use of 27 University Avenue to support transit growth and accessibility to this key Peninsula transit center area, along with potential for other appropriate uses.

With carefully defined alternatives thoroughly analyzed, the City's Comprehensive Plan Update EIR will provide the City Council with the information it needs to guide the City's land use future for the next 15 years.

THE FOUR CONCEPTUAL SCENARIOS ARE NOT YET APPROPRIATELY DEFINED FOR ENVIRONMENTAL ANALYSIS

Scenario 1: "Do Nothing/Business as Usual"

The Staff Report defines Scenario 1 as the CEQA-required No Project Alternative, which would keep existing Comprehensive Plan policies in place. The existing Comprehensive Plan imposes a non-residential citywide development cap of approximately 3.2 million additional square feet (Policy L-8). But the Staff Report states on page 3 that this existing Comprehensive Plan policy is *not* included in Scenario 1. Instead, the Staff Report states, Scenario 1 "*unrealistically* assumes the City would not take steps to defend or replace these caps and is intended simply to provide a baseline for comparison with other scenarios rather than speculating as to what the outcome(s) of a future planning process might be."

The No Project Alternative cannot be based on "unrealistic" assumptions. Instead, the No Project Alternative should reflect what would be reasonably expected to occur if the existing Comprehensive Plan remained in place, which means that the existing Plan policies would be continued into the future as those policies currently are written.

Scenario 2: "Slow Growth and No Changes in Land Use Designations" & Scenario 3: "Slow Growth and Adjust the Location of Housing Sites"

Scenarios 2 and 3 are insufficiently defined for an effective environmental analysis. As indicated in Attachment I to the Staff Report, both of these scenarios are intended to "slow the pace of non-residential growth in the city." But, as the Staff Report acknowledges, the City has not yet identified what the existing pace of non-residential growth in the City has been in the past, let alone identified how much Scenarios 2 and 3 would constrain that growth in the future. Without this information, the EIR preparers cannot begin to analyze the impacts of the non-residential growth that would be allowed under these scenarios. Equally important, without knowing how far below ABAG and Plan Bay Area job growth projections the City would fall, the EIR preparers cannot analyze the impacts of the non-residential growth that would be displaced to other communities. A limit on growth in one area may have the effect of displacing development to another area, and such an impact needs to be part of the EIR evaluation.

If the Council decides that the EIR should analyze Scenarios 2 and 3, it should decide what pace of non-residential growth is to be studied under each of the scenarios, and this decision should be

informed by data regarding the past pace of non-residential development under the existing Comprehensive Plan.

Experience in the Stanford Research Park demonstrates that desired, City-approved non-residential growth has varied dramatically from year to year as economic conditions have fluctuated and technological innovation has accelerated. Twenty years ago, from 1994 to 2003, the Stanford Research Park grew at an average rate of 71,000 square feet per year as several larger campuses were redeveloped to accommodate research and development of modern technologies. However, over the past 10 years, from 2004 to 2013, the Stanford Research Park has grown at a quite modest average rate of 16,000 square feet per year.¹ In some years growth has been zero.

For the growth that has happened over the past 10 years, much of it occurred over two years, from two tenants. In particular, Hewlett Packard – a homegrown and world-renowned Palo Alto company, as well as one of the Stanford Research Park’s largest sales tax producers – needed to add 35,000 square feet for an executive briefing center. Its ability to secure this additional space was an important factor in the company’s decision to recommit to keeping its headquarters in Palo Alto. Theranos – another local, thriving and newly world-renowned company – similarly needed a larger facility to keep its headquarters and operations in the City. This was accomplished through the redevelopment of the old Wall Street Journal site on Page Mill Road and the ability to add 47,000 square feet at that site under the current zoning.

These important opportunities might easily have been lost to the City and Stanford under an annual cap regime, depending on other development elsewhere in the City. As described below, a Comprehensive Plan alternative should be analyzed that would retain the City’s discretion and flexibility to allow for growth and change in support of companies’ strategic initiatives, so that these types of successes can continue in Palo Alto.

Finally, Stanford has an additional question regarding Scenario 2 as it is currently described. Attachment I to the Staff Report states that “additional housing would not be built” in the Stanford Research Park under Scenario 2. Multifamily housing is currently a conditionally permitted use in the Stanford Research Park. Is the intent of Scenario 2 to eliminate this conditional use?

Scenario 4: “Net-Zero Concepts”

Scenario 4 is also insufficiently defined to form the basis of EIR analysis. First, as the Staff Report recognizes, Scenario 4 does not identify which net-zero concepts might be included; the phrase “such as” precedes all of the listed concepts, which include energy use, greenhouse gas emissions, vehicle miles traveled, potable water use “and/or” natural gas hookups. The current

¹ This figure includes amenity space that is not counted toward gross floor area because such on-site amenities reduce vehicle trips in a research park setting.

description of Scenario 4 fails to describe for the public and decision-makers what the actual components of this alternative will be for purposes of the EIR analysis.

Second, Scenario 4 does not explain what the net-zero concepts mean. For example, it is unclear whether net-zero VMT is intended as an absolute number, which is infeasible, or a per-capita number, which may be feasible. Similarly, experts in the field have thus far been unable to define how to measure zero-net energy building use. Scenario 4 also refers to recycled water use, but the City is currently studying in a separate EIR process whether, how, and under what conditions expanded recycled water use requirements may be implemented.

Third, Scenario 4 does not define where and how the net-zero concepts would and would not apply. As the Staff Report explains in Attachment I: “Some policies might be applied citywide; others would be focused on specific areas.” Again, critical information is missing in how the Scenario is defined for purposes of a meaningful EIR analysis.

For all of these reasons, the Council needs significantly more information before it can make the important policy judgments that are required to define what, if any, version of Scenario 4 merits further, detailed evaluation in the upcoming EIR.

AN ACTION ALTERNATIVE CONSISTENT WITH PLAN BAY AREA AND ABAG GROWTH PROJECTIONS SHOULD BE ANALYZED

The Staff Report states on page 18 that the “reason for analyzing multiple scenarios is that this approach will provide the public and decision-makers with an understanding of the key environmental tradeoffs...” involved in the Comprehensive Plan Update. But the three action alternatives currently proposed for analysis in the EIR – Scenarios 2, 3 and 4 – would shed little light on these environmental tradeoffs.

As shown in Table 1 of the Staff Report, other than possibly the “Do Nothing/Business as Usual” scenario, none of the scenarios would allow the City to accommodate the job growth described in Plan Bay Area and ABAG projections (unless the to-be-defined “net zero” concepts of Scenario 4 could feasibly be met at a level sufficient to meet those projections). In addition, none of the scenarios describe how the City would meet its anticipated Regional Housing Needs Allocations; even Scenario 4 is described on page 19 as providing only “somewhat more” housing than a number that is “substantially less” than the City’s likely RHNA.

The Comprehensive Plan Update EIR should study a responsibly planned, transit-oriented action alternative that would clearly allow the City, as a prominent regional actor, to accommodate its appropriate share of job and housing growth through 2030. Analysis of this type of action alternative was urged at the Planning Commission meeting and it should be given thorough and thoughtful consideration through the EIR process, so that the public and the decision-makers can understand and assess the key tradeoffs involved.

Ms. Elena Lee, Senior Planner
August 4, 2014
Page 6

Stanford recognizes that an action alternative that facilitates the job and housing growth projected for Palo Alto through 2030 is likely to show greater environmental impacts, at least before mitigation, than would Scenarios 2, 3 and 4.² Stanford is not suggesting that such an alternative should ultimately be selected for an updated Comprehensive Plan. But studying a more diverse range of alternatives will allow the City to truly understand key environmental tradeoffs during its decision-making on the Comprehensive Plan, which is the stated goal of the CEQA process.

POTENTIAL CHANGES OF USE FOR 27 UNIVERSITY AVENUE SHOULD BE ANALYZED

Various concepts have been suggested for new development and a change of use at and adjacent to 27 University Avenue. Stanford requests that the Comprehensive Plan Update EIR analyze 27 University Avenue as, first and foremost, a transit center, and that any additional uses for the site be studied only if they do not undermine that function.

TECHNICAL INFORMATION FOR THE EIR

Stanford has reviewed the environmental analysis topics listed at pages 11 through 18 of the Staff Report and notes the substantial research the EIR preparers intend to perform. Stanford has extensive information regarding Stanford lands that may be helpful to the EIR preparers. This information is publicly available from various sources, but Stanford has collected it. We encourage the EIR preparers to contact us for copies of such materials to avoid potential inconsistencies and unnecessary duplication of effort.

We appreciate the opportunity to present these comments, and we look forward to a full and careful consideration of the range of policy and environmental issues that will need to be assessed as Palo Alto moves forward on this important planning process, which will profoundly affect the future of the City, Stanford and the region.

Sincerely yours,



Catherine Palter
Director, Land Use and Environmental Planning

cc: Hillary Gitelman

² Stanford notes that the Theranos and Hewlett Packard projects described above were not "net-zero" and that the City approved them after finding that their impacts would be mitigated to a level of less-than-significant.



Loma Prieta Chapter serving San Mateo, Santa Clara & San Benito Counties

August 6, 2014

Honorable Mayor Nancy Shepard and Members of the City Council
City of Palo Alto
Via e-mail: city.council@cityofpaloalto.org

Re: Comprehensive Plan Update and Scoping Session

Dear Mayor Shepard and Members of the Palo Alto View City Council,

The Sierra Club Loma Prieta Chapter respectfully submits the following comment on the Comprehensive Plan. Our chapter has many members in Palo Alto who are deeply cognizant of the uniqueness of Palo Alto and its stewardship of its natural resources, which they deeply value.

We strongly oppose Mixed Use/Residential in the area between 101 and the Bay at San Antonio Road and Embarcadero. Therefore we would be opposed to portions Scenarios 2 and 4 (Net Zero) if they envision the new village area might extend east (bay side) of 101 at the Embarcadero and San Antonio Road areas.

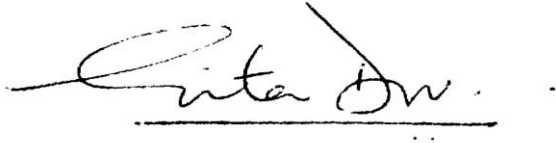
Therefore, we take the opportunity to make sure that in Scenarios 2 and 4 the village center would not extend east (bay side) of 101 to the Bayshore areas:

*The **East Meadow Circle/Bayshore** area would be slowly transformed from a research and office park to a new village center with a mix of housing types around a central plaza, as well as a potential new school. The office and light industrial uses along Fabian Way and Bayshore would remain as is and transit service to the area would be dramatically improved.*

There are several reasons why providing any housing, as part of mixed-use, on the strip between 101 and the bay is not good planning.

- Sea Level Rise makes this the most vulnerable area and these areas are not appropriate for placing vulnerable populations with homes and children. Please note the recent publication of the State Report on Sea Level Rise authored by Assemblyman Richard Gordon. www.sealevelrise.assembly.ca.gov/reports.
- Increased traffic: Locating housing on the “other side” of 101 will generate more traffic than usually associated with housing as residents would have to continually cross 101 to reach service centers which are all located on the south side.
- Service businesses will not locate on the north side of 101, as there is not a sufficient population to support retail or other services.
- Long range planning ordinances may actually require this area to be set aside for sea level rise effects, as the bay shoreline moves, in order to preserve natural features for the health the bay and its wild resources.

Respectfully submitted:

A handwritten signature in black ink, appearing to read "Gita Dev", is written over a horizontal line. The signature is fluid and cursive.

Gita Dev
Sustainable Land Use Committee, Co-Chair
Sierra Club, Loma Prieta Chapter

Cc Palo Alto City Council members
Palo Alto City Clerk
Bruce Rienzo, Chair, Executive Committee, Sierra Club, Loma Prieta Chapter
Mike Ferreira, Chair, Conservation Committee, Sierra Club, Loma Prieta Chapter
Gladwyn DeSouza, Chair, Transportation Committee, Sierra Club, Loma Prieta Chapter



STANFORD UNIVERSITY
LAND USE AND ENVIRONMENTAL PLANNING

VIA EMAIL

November 19, 2014

Hillary Gitelman
Director of Planning and Community Environment
City of Palo Alto
285 Hamilton Avenue
Palo Alto, CA 94301

RE: Comprehensive Plan Update Draft Existing Conditions Report

Dear Ms. Gitelman:

Thank you for the opportunity to provide Stanford University's comments on the City of Palo Alto's Comprehensive Plan Update Draft Existing Conditions Report. Please let me know if you have any questions.

Aesthetics and Visual Resources

Page 1-2, View Corridors –The Stanford University Medical Center Area Plan Update, May 2011 was developed for the Stanford University Medical Center.

Page 1-12, Foothill Expressway – Junipero Serra Boulevard – JSB between Page Mill Road and the golf course is within unincorporated Santa Clara County, not the City of Palo Alto.

Page 1-13, Oregon Expressway/Page Mill Road – The report states, "The outstanding views along upper Page Mill Road are largely preserved through the City's 200-foot setback requirement. Page Mill Road leaves Palo Alto near its terminus at Skyline Boulevard." Page Mill Road, from Foothill to 280, is mostly flanked by Stanford's lands in unincorporated Santa Clara County and is not subject to the City's setback requirements. It is unclear if the text is referring to the views of this area or further up Page Mill Road.

Biological Resources

Page 3-7, Stanford University Habitat Conservation Plan - The description of the HCP in the document is from an older 2012 HCP. The report should refer to HCP (Dated March 2013) which was issued by USFWS in August 2013 for all information and citations. <http://hcp.stanford.edu/documents.html>

Page 3-9, Table 3-2 Stanford University Habitat Conservation Plan Biological Goals - Delete Goals #5 and #6. These are not in the final HCP.

Page 3-13, Lakes and Ponds – The correct name is Felt Reservoir, not Felt Lake. This is a global edit throughout the document. Here, this reference should be removed, as Felt Reservoir is not in Palo Alto, nor is it in the SOL.

Hillary Gitelman, Director
November 19, 2014

Page 3-14, Plant Communities of Concern - Reference to Jasper Ridge should be removed as it is not in Palo Alto, nor is it in the SOI.

Page 3-25, San Francisco garter snake – This is a global edit, all references to Searsville Lake, should be changed to Searsville Reservoir.

Page 3-27, Watersheds and Riparian Corridors - There is reference in the Matadero Creek watershed to “the Stanford Channel.” What is this?
Felt and Searsville Reservoirs are not in Palo Alto, nor in the SOI.

Cultural Resources

Page 4-2, NAGPRA - It would be helpful to note that NAGPRA rules only apply under very specific conditions: on lands owned or leased by a federal agency, on lands held in trust by Native American tribes, and for projects that require federal permits or receive federal funding.

Page 4-5, Some mention of the Mills Act tax relief program for historic properties would be important here. A list of properties under Mills Act contracts would also be a useful addition so that the community can appreciate the impact of the program in Palo Alto.

Page 4-6, similarly it would be helpful to describe how many deed covenants have been recorded with subdivisions and how many commercial properties have received FAR bonuses.

Page 4-7, Paleontological Resources. We are unaware of any public property on Arastradero Road where fossil beds can be seen. We are concerned that mention of specific vicinities of fossil finds might encourage the curious to trespass into sensitive biological areas (Deer and San Francisquito Creeks) and onto private property. A more general discussion without street names might be prudent. The same comment applies to the paragraph on archaeological resources – these exist along all the creeks in Palo Alto; it is not helpful to emphasize San Francisquito Creek.

Page 4-9, Figure 4-1 Archaeologically Sensitive Areas. It would be useful to understand the methodology for creating this map. The categorization is confusing and inconsistent. The addition of the parks and open space layer is confusing and adds no value to this map. We would further note that the “extreme” sensitivity is revealing the location of sites that are confidential under state law. We feel that this map is highly problematic and should be refined or removed from the chapter.

Page 4-10, We are concerned that the phrase “converting Native Americans and disciplining them to become a more productive labor force” might offend some Native Americans. We further note that the Native Americans just drop out of the narrative completely and there are still thriving tribal communities in the Bay Area. We suggest changing the casual reference of “Leland was a member of a temperance movement” to a more formal reference of Leland Stanford, Sr. or Governor Stanford or Senator Stanford. There is no citation and the point that he was a member of the temperance movement is a bit sketchy. We are unaware of any proposal to build the university in Mayfield and any vote to reject the building of the campus in Mayfield. The university was built in its planned location.

Page 4-12, The Post War period began in 1945; the discussion of post war housing should be moved to the right section (the Eichler subdivisions for example belong in the Post War period and they are currently in the “Early Development” section). The assertion that the “development of the Stanford Research Park was a significant development because it can be seen as the seed that would eventually become Silicon Valley” is not supported by the discussions of the HP Garage, Federal Telegraph

Company, and Fairchild Semiconductor sites which suggest a more diffused pattern of innovation on sites that were “seeded” quite early.

Page 4-13, Similarly the phrase “The Stanford Shopping Center is another Palo Alto landmark” is drawing a conclusion that is not supported by survey and analysis. The term “landmark” in a cultural resource context derives specific legal meaning that isn’t supported here. We also suggest that the notion that the Ohlone peoples “revered” the El Palo Alto is unsupported and should be removed as we have no evidence to support it and attributing spiritual values to people of other cultures is problematic.

Pages 4-17, 18, Please include the National Register listed Southern Pacific Railroad Depot as a designated resource. We suggest omitting the discussion of the Juana Briones house as it has been demolished and thus is no longer part of the city’s existing conditions.

Page 4-16, Figure 4-2 Historic Sites and Districts. It would be helpful to know what the “historic sites” are – properties on the inventory? Which version of the inventory? Are these the Category 1, 2 and 3 buildings discussed on pages 4-5 and 4-6? Maybe a note on the map legend would clarify this.

Hazards and Hazardous Materials

Page 6-14, Figure 6-1 does not display the Envirostar data correctly, and the data is incomplete. It is unclear why these locations are shown, as any business that has a hazardous materials business plan or hazardous material inventory plan could be listed throughout the city of Palo Alto. The Envirostar data includes information that is no longer valid; several of the companies listed don’t exist anymore and permits have been terminated. It’s unclear if the items shown by dots in this same figure are current or historical, which if it’s historical, shouldn’t be included in an existing conditions report. It is unclear why information outside of Palo Alto is included in the map. Information is included for Stanford and East Palo Alto, but for no other neighboring jurisdiction. All other maps within the existing conditions document are limited to the City of Palo Alto and its SOI.

Page 6-15, Figure 6-2. The Geotracker data are incomplete and include information that is no longer valid; several of the companies listed don’t exist anymore and permits have been terminated (e.g., 1701 Page Mill Road—Dow Jones; Roche formerly at 3431 Hillview Avenue). Any site that doesn’t exist should be removed from this figure. We don’t believe the map is helpful in communicating the data and may lead to confusion and misunderstanding by the community. The same concerns with Figure 6-1 apply to Figure 6-2.

Page 6-16 and 6-17, Tables 6-1 and 6-2. These tables group together projects of varying status that makes it impossible to convey to the reader the actual status. For example, “Certified,” “No further action,” or “De-listed,” should not be grouped together as they all have very different meanings and status. The same is true for “Active,” “Backlog,” “Inactive,” or “Referred to another agency.” We recommend deleting these tables as they don’t help the reader understand the information any better, and they can be misleading. Table 6-2. If this information is kept in the report, we suggest that residential USTs be included. It is unclear why they are omitted.

General comment: It is unclear the purpose of this information. The scale of the maps makes the information difficult to see, the data are incomplete and grouped together so that it is difficult to know the status of a site. It would be better to just provide information for the oversight agencies and the types of permits required.

Hydrology and Water Quality

Page 7-11, Table 7-1. The Stanford Community Plan includes specific policies applicable to Stanford. The Community Plan is an adopted part of the Santa Clara County General Plan and should be the source document.

Page 7-16, Again, there is reference to “the Stanford Channel” and we don’t know what that means.

Page 7-17, Lagunita should be referred to as a Reservoir and not a Lake. The HCP should be used as the source for a description of the HCP, not Wikipedia. Lagunita’s description should be changed to note that Lagunita fills every year with surface water and is sometimes supplemented with water from San Francisquito Creek or wells to support CTS breeding.

Page 7-29, Figure 7-5, The map references “Searsville Lake”, but Searsville Reservoir is not depicted on the map.

Land Use

Page 8-7, The Stanford Community Plan covers approximately 1,518 acres within the City of Palo Alto SOI, not 3,040 acres.

Page 8-8, Figure 8-2, We’ve attached an updated Land Use Designation map. We suggest adding the SOI to this map for clarification.

Page 8-11, Table 8-1, The SRP has both “RP” and “RP-5” zoning.

Page 8-14, Figure 8-3: The land use designations shown by the City for Stanford University do not match the County of Santa Clara’s land use designations for Stanford’s lands. We understand that this is an existing conditions report, and the maps reflect the current City of Palo Alto Comprehensive Plan land use designations. However, the land use designations for Stanford lands are outside both the City of Palo Alto’s city boundaries as well as the SOI, and therefore, should not be incorporated into any future land use plan for the City. We’ve provided an updated County of Santa Clara land use designation map for reference.

Page 8-19, “Research/Office Park”: Churches do NOT require a CUP in the SRP; they are a permitted use.

Page 8-30, The Williamson Act Contract information is incomplete. El Camino Park (APNs 120-31-001 and 009) and “Coyote Hill” (APNs 142-16-052, 057, 064, 065, 069) are subject to the Williamson Act.

Page 8-34, Table 8-3 “Land Use”: Bullet point #2 under “Notes”: Should state “Data excludes Mayfield Development Agreement projects, which demolishes approximately 330,000 of.....” (not 323,000).

Noise

Page 9-14, Figure 9-2, LT-1 and LT-2 are transposed. SHC and LPCH are not identified as sensitive land uses.

Population, Housing, and Employment

Page 10-17, Table 10-21 – The title of the table is “Major Employers of Palo Alto Residents,” but the information is total number of employees. The information doesn’t display the number of Palo Alto residents the company employs. The label is misleading and should be changed to something like, “Major Palo Alto/Stanford Employers.” The numbers cited for Stanford University do not include faculty. The correct numbers are listed below. Also, we received updated headcount from VMware and Wilson Sonsini.

- Stanford University (including SLAC employees): approximately 15,300
- Stanford University (not including SLAC employees): approximately 14,000
- Stanford Health Care (formerly Stanford Hospital and Clinics): approximately 8,600
- Stanford Children’s Health (Lucille Packard Children’s Hospital): approximately 2,900
- VMware’s campus headcount is approximately 4,600 (as of 9/2014)
- Wilson Sonsini has approximately 800 employees in Palo Alto

Transportation

Page 12-5, Santa Clara Valley Transportation Authority and Congestion Management – We suggest including something about the joint MTC/BAAQMD program that requires employers of over 50 FTE to offer commuter benefits.

Page 12-8, Palo Alto Municipal Code – We suggest adding in information about the district traffic impact fee requirements and the programs and improvements they support.

Page 12-9, Public Transit Service – Stanford’s Marguerite Shuttle serves the Stanford campus, Stanford Shopping Center, the Stanford Medical Center, the SLAC National Accelerator Laboratory, the Stanford Research Park, and the San Antonio Shopping District.

Page 12-10, Figure 12-1, The campus roadways should not be designated as arterials. They do not primarily serve through traffic. They should be designated as local or collector streets and they are for the most part private.

Page 12-11, Figure 12-2, Lines A and B are actually lines X and Y. The VA is discontinued. Here is a link to the most up-to-date Marguerite map. <http://transportation.stanford.edu/pdf/marguerite-map.pdf>

Page 12-12, Table 12-2, having only 6 months of information for 2014 is misleading. Either the whole year should be provided or no information in order to make comparisons.

Page 12-16, Stanford University Marguerite Shuttle – Line SE has daily and weekend service. Daily service is from 3:00 pm – 10:25 pm. Also, there is no mention of the RP, SLAC, BOH, R or TECH lines. Please refer to the updated Marguerite map.

Page 12-21, Dedicated Facilities- Stanford has completed a partially paved and partially unpaved path which runs from Page Mill/Deer Creek to the Arastradero Trail. The paved portion allows bikes; the unpaved portion is for hiking only.

Hillary Gitelman, Director
November 19, 2014

Page 12-32, Table 12-9, Arastradero Road between I280 and El Camino Real is not commonly viewed as LOS C. This should be verified.

Page 12-35, Table 12-11 – The last line in this table should be “Internal – Internal,” not “Internal-External.”

Page 12-41, Table 12-16, the column labeled “existing” should really be labeled “1997/1998.”

General comment: We request that the City confirm how the VMT was calculated for Stanford University.

Utilities and Service Systems

Page 13-11, Stanford University is not within the City of Palo Alto and would therefore not be subject to the recycled water project. The recycled water project is currently being reviewed and analyzed under CEQA. Stating how it will be used has not yet been determined.

Thank you, and please let me know if you have any questions.

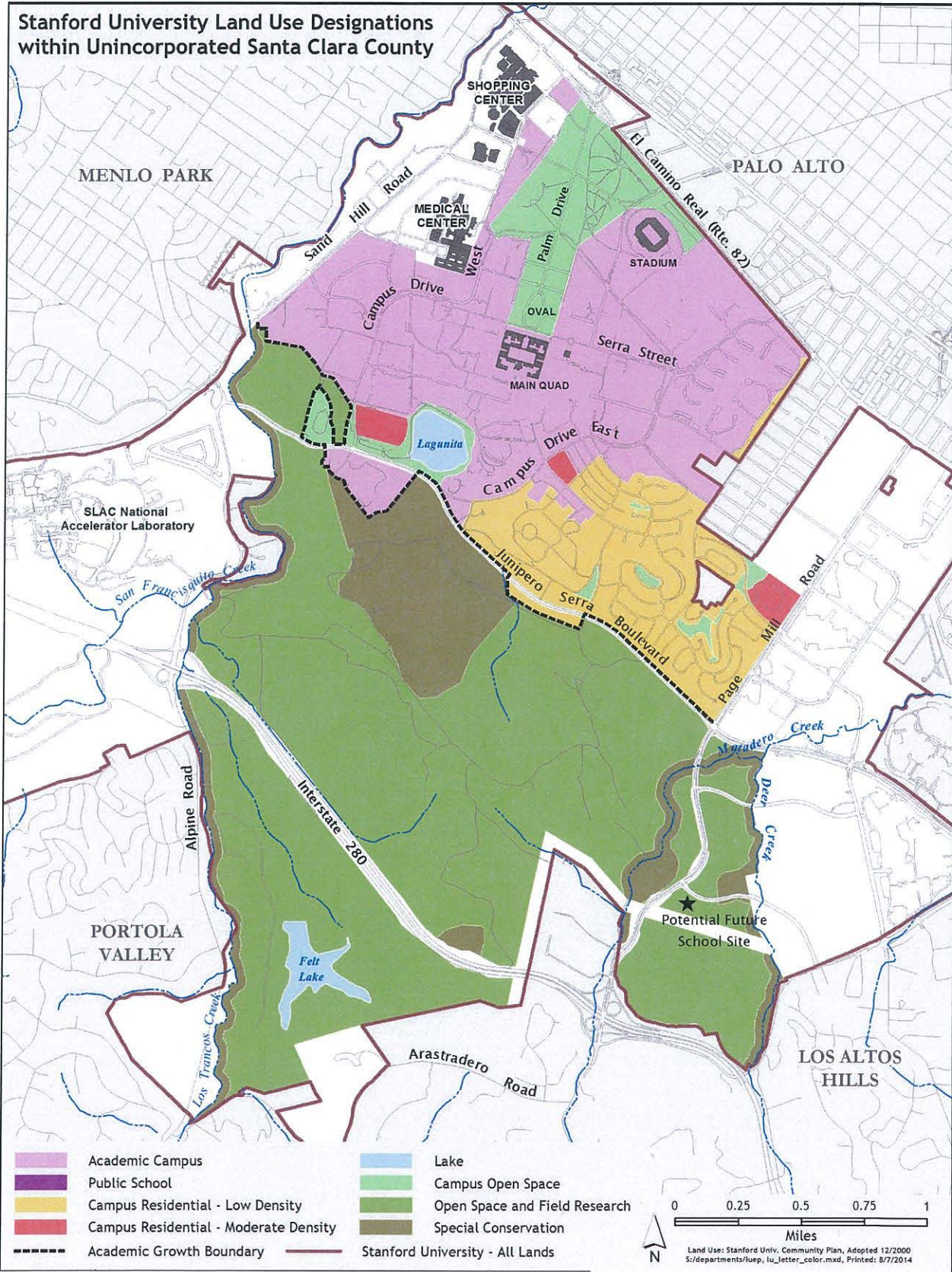
Sincerely yours,

A handwritten signature in black ink, appearing to read "Whitney McNair", written in a cursive style.

Whitney McNair

Senior Associate Director, Land Use and Environmental Planning

Attachment: Stanford University Land Use Designations within Unincorporated Santa Clara County



word out on all of these issues and ensure that by the end of the day we have a full suite of input from all directions on this planning process and everybody's idea is taken into consideration as we start to winnow down and get to a revised plan. With that I'm going to hand it over to Steven and his consultants for a brief presentation and then we'll get on to the main event, which is the public testimony and the Commission's feedback on the materials in your packet.

Steven Turner, Advance Planning Manager: Great, thank you Hillary. I'm Steven Turner the Advance Planning Manager. I'm very pleased to bring this back to the Commission for your review and comment. The last time that we met with the Commission was back at the end of April on April 30th and at that time staff presented you with a status update on our work on the Comprehensive Plan Update and we also described the Our Palo Alto concept that the City Council had adopted as a framework for organizing all of the concurrent planning efforts that staff has been working on over these past few months. And we also outlined a schedule for completion of the Comprehensive Plan Amendment by December of 2015.

But we have a lot of good news to report since our last meeting. Number 1, Council reviewed the Planning Commission's work of goals, policies, and programs that were contained in our Comprehensive Plan policy document version 1.0. Council provided a lot of comment and feedback and that feedback is contained within an attachment in your staff report so you can see what they've said about those policies and programs. Number 2, Council also accepted our plan for community engagement. Staff has been working extremely hard over the past two or three months to really implement that plan and we have a lot of information to present to you tonight with that regard. Council also accepted the California Avenue Concept Plan as part of the Comprehensive Plan Update and so that will be moving forward with the Comprehensive Plan. As Hillary mentioned we are, have developed the Leadership Group that will advise us on engagement matters and that will start up very shortly. And I think probably the best news is that we're still on schedule. Which is no small feat given all of the time that it's taken so far.

So really where are we now? As I mentioned before we have draft goals, policies, and programs contained within our policy document. We've released a Notice of Preparation (NOP) at the end of May, which really signals our intent to prepare a program EIR for the Comprehensive Plan and we'll talk a little bit about that as well tonight. We're in the middle of really the period of soliciting public input and comment within the program EIR. And tonight's meeting is a very important step in obtaining that public input. We have designed two opportunities in addition to the community engagement meetings that we'll talk about to solicit that input tonight and then also with the City Council on August 4th. Those are two opportunities for people to provide comments and questions that will help guide our environmental review going forward.

For tonight we really have two main goals: we want to accept the public testimony on environmental issues and the alternatives as proposed, and then have the Commission provide staff and consultants with any feedback that you might have regarding our direction. You're not taking any direct action tonight. Again, this is just one of the two official scoping meetings that we are having to solicit public input. We're extremely interested in the comments from the public and from the Commission again to help guide our efforts. We're not here tonight necessarily to respond to questions or comments on the EIR or the analysis tonight. Really what we're here tonight is to listen and to take in questions and comments that will help guide our analysis over the next few months. It would be helpful if the Planning Commission could express some concurrence especially over the draft alternatives that staff has put together and are contained within the staff report and that you'll hear more about this evening, but it's not required. But certainly having that concurrence that we can then report back to the City Council on August 4th would be very helpful.

And I think that is about all I wanted to mention before I introduce Joanna Jansen from PlaceWorks. PlaceWorks has been our consultant on the Comprehensive Plan Update for many years now and I think she is as excited as I am to finally get to this point of scoping meetings. With that I'll give it to Joanna.

Joanna Jansen, PlaceWorks: Thank you Steven. I have a brief presentation to explain to members of the Commission and the public what the EIR is that we're accepting scoping comments on tonight and also briefly go over the alternatives that we or that the initial concepts rather for the alternatives that we're

1 hoping to more fully flesh out over the next few weeks and that will be covered in the EIR. Steven's
2 already told you that our goals for tonight are mainly to listen to the public and to the Commission and
3 hear your comments so with that let me explain a little bit about what the EIR is. The... and I just want
4 to, this is I'm going to talk about the content, purpose, timeline of the environmental review process.
5 Where are opportunities for public input? Touch briefly on the concept of a program EIR and then go
6 through the topics that are going to be covered in the EIR we anticipate.

7
8 The EIR is an Environmental Impact Report. It's required by State Law, the California Environmental
9 Quality Act (CEQA). It explains the objectives of a given project, the location of the project, any actions
10 that are proposed and potential impacts that could occur to the environment to existing conditions in the
11 environment. And an EIR is also required to present feasible mitigation measures or alternatives to a
12 given project that could reduce or avoid the impacts. In our case the project that we're talking about on
13 this slide is the update of the Comprehensive Plan and I'll get into what that means a little bit later.

14
15 So the purposes of the EIR are to disclose information about the project and about its potential impacts
16 as well as about possible mitigation measures, to provide an opportunity for public input, and to support
17 the Planning and Transportation Commission (PTC) and the City Council in making a decision about a
18 given project. Again, in this case that project would be the Comprehensive Plan Update. We're looking
19 at a timeline of going on over about the next year and a half. We've already issued what's called a NOP.
20 That's a form that states for members of the community and for all State and other public agencies that
21 the City is preparing this document and it gives everyone a chance to respond to the City and say as
22 you're preparing this important environmental document here are the topics that you really need to make
23 sure you address. And this meeting tonight is an important part of that process. So that NOP was issued
24 on May 30th. Public agencies had until June 30th to give us their comments about what the EIR should
25 cover and the public has until August 6th to give similar comments including at tonight's hearing. So
26 again this is not comments necessarily on the project, but comments on what the environmental impact
27 analysis needs to keep in mind. It floods behind my house, there's terrible traffic at this intersection, you
28 need to keep in mind this important special status species, those are the types of comments that we can
29 receive during this scoping period about what we need to cover during the EIR.

30
31 And then once we have a full set of comments and everyone's had a chance to make sure that we heard
32 from them about what the EIR needs to cover we'll be conducting the analysis later this year through the
33 end of the year. And we're aiming to publish the draft EIR containing all of this analysis at the end of the
34 year in December 2014. And then that the public review period that would be yet another public review
35 period for people to review all of the information in the EIR. I'm sure most of you are probably familiar
36 with what an EIR is. It's often a very lengthy, very detailed document so we have 60 days. Right now
37 we're anticipating at least a 60 day public review period. That will be for the community as well as for
38 any other public agencies that want to review and comment on the draft EIR.

39
40 The next slide just gives kind of a visual diagram of the process that I just described highlighting again
41 the areas for public input, which is one of the key functions of an EIR. So right now we're in the on the
42 first column on the left we're in that white box of the 30 day scoping period, which is for the community
43 members is actually a 69 day scoping period lasting until August 6th. And then we will be working on
44 conducting the environmental review and publishing the draft EIR moving into another public review
45 period. After that second public review period on the draft EIR itself closes then we will be working with
46 City staff to respond to the comments. And the City is required to respond to each comment individually
47 in what's called a final EIR. There is then yet another public review phase for that final EIR document to
48 review how all of the comments have been responded to. And once that document is published then the
49 PTC can hold their hearings to review the final EIR and make a recommendation to Council. And then
50 the final step is for the City Council to certify the EIR and approve a project. So that approval will be
51 obviously contingent upon the information that's disclosed in the draft EIR and would likely be some
52 version of one or more of the alternatives that I'm going to talk about a little bit later in the presentation.
53 So the approval would be an adoption of an updated Comprehensive Plan.

54
55 When we're doing an EIR on a plan especially a plan that affects an area as large as the entire City of
56 Palo Alto we do what's called a program or programmatic EIR and that's distinguished from a project

1 level EIR. A project level EIR is, deals with a specific site or a certain number of parcels. You will have
2 diagrams of exactly what the buildings are going to look like on the parcel, where the parking is going to
3 be, where the entrances and exits are, which trees would be kept or removed, a very high level of detail
4 about that specific project. And the EIR on that project would look at that level of detail, look at site
5 specific analyses of hydrology or biological resources or cultural resources and then identify and mitigate
6 any particular impacts for that project. When we're looking at a document like the Comprehensive Plan
7 obviously it's much more difficult to say exactly how a given parcel would be developed or where a
8 particular driveway cut would be. We don't look at the City in that level of detail.
9

10 In a programmatic EIR we're looking much more conceptually at what type of development would be
11 allowed and where and although there is a quantified analysis of things like traffic impacts and air quality
12 impacts there are not site specific studies for any particular parcel. So it's a much more conceptual level
13 of detail in a programmatic EIR and because of that additional development projects that go forward
14 under the Comprehensive Plan would then depending on what type of project they are require additional
15 levels of environmental analysis. And that's the point where you would get the site specific level of
16 detail. So that's just a little bit about the difference between a project level EIR and a programmatic EIR
17 like the one we'll be preparing for the Comprehensive Plan Update.
18

19 Both EIRs no matter what level of detail they're at, both types of EIRs including the programmatic EIR
20 have a similar list of topics that they address and again these are established in the CEQA. So this is a
21 list of the topics that we anticipate addressing in the EIR. Again it focuses on impacts to the existing
22 physical environment and it covers as you can see a very wide range of topics including some topics that
23 are perhaps slightly less about the physical environment like the public services sections, which look not
24 only at the physical environment, but also at the services provided by the City and to serve development.
25

26 So what your EIR is going to cover is a range of alternatives. You can go ahead Elena. And these
27 alternatives are part of your packet tonight in their very initial preliminary form. They have been the
28 result, where we are today is the result of a series of meeting that have been held over about the past
29 month and a half or so since May 29th. The EIR as I mentioned is going to cover each one of the
30 alternatives in the same level of detail, which is rather unusual and innovative for an EIR on a
31 comprehensive plan. And so it's worthwhile to explain a little bit about what those alternatives are and
32 how they're shaping up so far. So we've had a series of three meetings with the public and I see a lot of
33 familiar faces from those meetings, so thank you all for continuing to be involved in the process. We're
34 very grateful for your time. We've had meetings starting on May 29th, June 10th, and June 24th that built
35 on each other and I'm going to speak briefly about each one of those.
36

37 At the first meeting we talked about critical issues and we asked small groups to complete a SWOT
38 exercise to consider Palo Alto's strengths, weaknesses, opportunities, and threats. And a number of
39 common themes emerged from the groups in each one of those four categories including the importance
40 of maintaining Palo Alto's high quality of life, building on and taking advantage of the unique relationship
41 with Stanford, addressing concerns about traffic congestion and public trust, reaching out to citizens and
42 making sure that they're integrated and engaged in this process, concerns about the high cost of housing
43 both rental and ownership, and interest in high speed rail or Caltrain electrification both as a threat and
44 an opportunity. There were a number of other critical issues that were identified through the SWOT
45 exercises. Those are just some of the highlights that we heard from many of the small groups. The
46 complete feedback from that website, excuse me, from that meeting and all of the meetings is available
47 on the general plan, excuse me, the Comp Plan Update website.
48

49 So if you go to the next page you can see an example of the online engagement that we've, is also
50 possible on both this topic and the opportunity sites topic that I'll address in just a second. In a way, as
51 one of the ways of reaching out to citizens who can't take three hours out of their evening to come to a
52 meeting we have put up online versions of several of the exercises that we've done at the workshops and
53 this is just one of those exercises. So if you go to the project website or if you scan this Quick Response
54 (QR) code with your telephone then you can get immediately to this online tool and we're definitely still
55 taking input and we'll welcome additional input through the online tools that are available.
56

1 So after working on some of the strengths, weaknesses, opportunities, and threats at the first workshop
2 we then moved to talking about potential growth in Palo Alto. What's projected for the region and for
3 Palo Alto? What do other California cities do to manage growth? And then we asked small groups to get
4 together and look at maps of Palo Alto and brainstorm about areas that might potentially be appropriate
5 to accommodate change and which areas should be preserved over the next 15 years during the life of
6 the updated Comprehensive Plan. So if we see on the next slide there is an example of what one of
7 those table maps look like after the small group discussion and then looking at all four of the small group
8 table maps that were created staff and consultants worked together to collate those into a synthesized
9 map of six specific opportunity site areas that we focused on then at the third workshop. I'm noticing
10 that the top of this map is a little bit cut off so I apologize for that, but there is also an area including the
11 Stanford Shopping Center, Downtown, the entirety of the El Camino corridor, the California Avenue area,
12 the Stanford Research Park area, the East Meadow Circle and Bayshore area, and then the San Antonio
13 Road area as the six opportunity site areas that came out of the small group work at Workshop Number
14 2.

15
16 And then so at Workshop Number 3 we asked the participants there to look at those areas and think
17 about for each of those areas what are some different alternative ways that they might develop? And to
18 help spur that conversation we provided three potential alternatives very conceptual and offered
19 participants the chance to respond to those alternatives and revise them or to create their own new
20 alternative. So we had about 70 people ended up working in about nine small groups and each one of
21 those groups came up with a slightly different variation on the alternatives. Some groups created
22 completely new alternatives. I think we had two groups that chose that alternative that chose to create
23 their new alternative. Other groups worked with one of the three preliminary alternatives that we had
24 suggested and then made changes and refinements to that. So at the end of that workshop we then
25 took the feedback from those groups and tried to synthesize them into the draft alternatives that you
26 have to consider tonight. Before I move on to talking about those I just want to note that in addition to
27 the workshop, the face to face workshop, again online right now we have this tool where we are still
28 collecting input about these particular opportunity sites, what role they should play in the City in 2030,
29 what they should look like, what policies or programs might be necessary to achieve your vision for these
30 areas 15 years from now. So again that's ongoing and we welcome continued input with that online tool.

31
32 So from all these sources we have now the four alternatives that are described in greater detail in your
33 staff report. They, before I start talking about each one of them individually I just want to stress that all
34 alternatives would preserve existing open space areas and existing areas that are zoned R1. We've heard
35 very clearly through this process the importance of residential neighborhoods and the importance of open
36 space to Palo Alto's character and its quality of life and so none of the alternatives would include changes
37 in those areas.

38
39 The alternatives include a do nothing alternative. In CEQA this is called the "no project alternative."
40 That doesn't mean that nothing would happen between now and 2015, it means that none of the existing
41 regulatory documents would be changed. So the project that we've been talking about is an update to
42 the Comprehensive Plan. Under the no project alternative the existing Comprehensive Plan and existing
43 zoning would all stay in place as they are. Number 2 would slow, Concept Number 2 would slow non-
44 residential development and allow some modest housing growth. That's contrasted with Concept
45 Number 3, which would slow non-residential development, but would not discourage housing growth or
46 limit it, but would rather focus it in areas that are served by transit. And then finally Concept Number 4
47 is somewhat less about the location of development or type of development and more about ensuring
48 that new development is coupled with exploring potential new net zero impact concepts. And I'll talk a
49 bit more about each one of these briefly and that will be the end of my presentation.

50
51 So again under Concept Number 1, the do nothing alternative, existing Comprehensive Plan policies and
52 zoning designations would be in place and those designations do allow for some new development. So
53 new development would go on, it would go on under the existing policies that are in place. Under those
54 existing policies the City is already poised to see a relatively slow change in the types of uses along El
55 Camino Real. The California Avenue area would continue to see the types of there would be nothing to
56 change the types of development projects that are being proposed in the California Avenue area.

Existing job centers like the East Meadow Circle area or the Stanford Research Park would remain job centers and would not have any housing or other types of uses added to them. And again in the staff report there is much greater detail about each one of these alternatives.

Under Concept Number 2 we would slow non-residential development. Housing growth would be focused on that that is necessary to meet State requirements and there would be no change to existing land use designations. Under both this alternative and the next alternative Concept 3 there, the City would adopt a new procedure for metering the pace of office and Research and Development (R&D) projects over 10,000 square feet. This is the opportunity for me to emphasize that these concepts are all very preliminary at this point. The ideas are still percolating about what the concepts should be. We're here to hear from you tonight. We're going to be hearing from the Council on August 4th. The particular mechanism for example for regulating office growth, the legality of that mechanism, the accommodation of the permit streamlining act, all of those types of details would definitely have to be worked out and they are not worked out yet. So when we have the alternative and when we do the EIR those are details that are definitely going to have to be fleshed out before we begin the EIR analysis. We're not quite there yet. We're still working on forming these alternatives.

But in this alternative again we would focus residential growth on meeting State requirements and limiting residential growth really to that kind of bare minimum that would be needed to meet State requirements. There is not, there would not be a significant change to the existing character or mix of uses in Downtown or along Cal Avenue or in any of the places that are primarily job oriented right now like the Research Park/East Meadow Circle. And along El Camino the character would be a little bit more lower density, increased setbacks away from the road, three story height limit for example on new development.

Concept Number 3 would similarly slow non-residential development, but in the case of residential development it would shift development, residential development capacity from existing residentially zoned areas to areas that are within a half mile of Caltrain or Bus Rapid Transit (BRT) stations. So the capacity would essentially be down zoned in many areas in order to up zone those areas that are within a half mile of the transit stations and accommodate increased development there as a way of further strengthening protections for existing residential, single family residential areas. Also under this alternative we might test the possibility of depressing the Caltrain tracks from San Antonio to Page Mill Road and we would add, Downtown would change to add more housing, adding housing also along El Camino Real and not along Cal Avenue itself, but in the area around Cal Avenue, and in the Research Park most likely along El Camino again in areas that are particularly close to the BRT stations or otherwise well served with transit.

And then finally in Concept 4 there would not be growth management instruments added such as a restriction on new office and R&D development, but instead the City would adopt policies to address the impacts of that new development whether it would be from the vehicle trips that the development would generate, the greenhouse gas emissions, water consumption, energy consumption, net zero is a very broad concept that could be applied to many different aspects of development. As part of that project or that alternative rather we would consider mixed-use projects along El Camino and some of those could even go over 50 feet in height. That might be in exchange for providing a certain type of housing or achieving a certain net zero goal that the City established. And the Research Park in particular might see the greatest amount of change under this alternative becoming a proving ground or a testing ground for a whole range of concepts that might include additional bike sharing programs, urban farming programs, alternative energy generation, water conservation programs. So the Research Park as a test case for a lot of net zero concepts under this particular alternative.

Before I end I just want to briefly explain what the process of these alternatives is. We've already done Step 1 of synthesizing the input that we heard from the workshops. We're now on Step 2, presenting the draft alternatives to you and to the City Council. Again, once the alternatives are better fleshed out and we have a little more input on how they're evolving then we will need to assign specific estimates of the quantity and type of development to each alternative so that it can be analyzed in the EIR including traffic modeling, air quality modeling, noise modeling, and other quantitative analyses. And then again,

1 each one of those four alternatives will be analyzed at an equal level of detail in the draft EIR which we
2 hope to publish at the end of this year. And I believe that concludes my presentation. So again, as
3 Steven mentioned we're here to hear from the public and from you on the topics of the EIR and on the
4 content of the alternatives if you have that input.
5

6 Chair Michael: So thank you very much for that excellent presentation. Let's now open the public hearing
7 and we'll allow anybody from the public who submitted a speaker card an opportunity to speak. We're
8 thinking this is an important topic. We want to definitely give you enough time to share your thoughts or
9 raise questions so individuals will have, typically we give three minutes, we'll give you up to five minutes
10 and if you're here on behalf of a group then you can have longer. I think there's at least one such
11 representative. We'll give you 9 or 10 minutes. Anyway, so Vice-Chair Keller who is first?
12

13 Vice-Chair Keller: Our first speaker is Neilson Buchanan and is he on behalf of a group? So I guess I'll
14 give you 10 minutes.
15

16 Neilson Buchanan: I brought a companion here and I can take his spot I'm going to be greedy.
17

18 Michael Griffin: My name is Michael Griffin. I'm yielding my time to my comrade in arms here.
19

20 Mr. Buchanan: I want to thank all of you for and all the people that have been working on the process so
21 far for this, the Comp Plan, which is got to be one of the most nebulous documents to describe to
22 someone that there is. There's one thing for sure for me is this will be certainly one of the best vetted
23 Comp Plans in a long time. The input I got as talking to sort of the middle management neighborhood
24 folks out there is that that's all and good, I don't want to get involved. It'll be updated by people brighter
25 than I am and no more and it will then go back into the usual dead document file. That it'll be used
26 heavily by people who know how to manipulate the system and nothing wrong with that, but it's not a... I
27 haven't heard of anybody in the country that has a dynamic comp plan. And something is missing for me
28 that there's got to be a companion to the Comp Plan and I've talked to the real experts and I still don't
29 understand what it could be. Maybe it's a set of concept plans for the critical areas of the City, maybe it's
30 the precise plan features that's sprinkled out along to hit the future pressure points that we know are
31 coming. So that's all I've got to say about the Comp Plan. I'm glad I'm not involved.
32

33 A more serious issue is your effort to engage people in the City planning. And the Comp Plan is just one
34 of those engagements. And as far as launching one I think you've done about everything that you could
35 expect to be done and it will be done better and all that stuff. But I, for the life of me I haven't been
36 able to figure out how do you keep people engaged? The Comp Plan itself is not an engaging document
37 in my opinion, but as I honed in on this and talked to a few people and said please take a look at this
38 there's one thing that began to excite people and that was these very rough scenarios that are coming
39 out through the EIR process. And what I would urge is that if you're looking for a role to take on that
40 you ought to periodically stop and take a look at the two to three to four scenarios that are going to
41 come out of this. Have them renewed periodically, take them back to the public and get comments on
42 just how does this grab you? Because each one of those scenarios, elements of each one of them excites
43 somebody, I don't think there's a single scenario, but there are elements in each one that I guarantee
44 you will fill up rooms if you properly vet that. And that would be a real interesting way I think to keep
45 people engaged.
46

47 I have about eight points here tonight, but I'm only going to cover about four or five of them. In fact I'm
48 going to steal ideas that I hear tonight and I'm going to rewrite them accordingly. None of that scenario
49 development and refinement can happen in my opinion I've said this publicly many times with the current
50 staffing of the Planning Department. There needs to be a dedicated data division and that actually spells
51 out 3D, but any normal corporation in America today has forward looking, has people that can capture
52 good data and look forward. And Hillary needs somebody dedicated, I don't know how much and it's not
53 my job to worry about how much, that does nothing more than create data, see where we are for
54 baselines and then make high, low, and medium projections whenever possible. That would drive those
55 scenarios very, in a very healthy fashion. So I don't think we can get from where we are to where we

1 want to be without a stronger reliance on professional data. Basically you got to have the tools of the
2 trade.

3
4 And I just want to close on one of my pet projects because it's going to test the mettle of this City. Let
5 me step back because I had a good chance to get some education from Steve Levy about something I
6 think is the overwhelming driver of what we're into. The regional Gross Domestic Product (GDP) is
7 growing at Steve? Five, six, seven percent, the stress on the cities is a couple of points below that.
8 That's real refined advice from the economist. And that's creating enormous pressure on every city and
9 town from the Bay Area, of the southern Bay Area from Oakland down to San Jose. And I don't think
10 we've begun to deal with the political and social impacts from the last couple of years and put I think is
11 the next two years. And that's going to create an enormous stress.

12
13 And let me just illustrate that whatever's going on in Menlo Park we'll know a little bit more next week on
14 what the City Council does, the reaction from Save Menlo Park and I'm not going to take sides one way
15 or the other. We had our own Maybell situation. There's balance Palo, Balance Mountain View going on
16 of trying to figure out what their balance between office and housing and density and very creative work
17 is going to come out of that. I had a chance to talk two hours with people down there yesterday and I
18 just and I've said it over again, I just don't want to throw our City into mass confusion and hate and
19 discontent, but we're creeping up there on that. Downtown parking is going to be a problem. The
20 parking permit issue is not permit parking, it's the quality of neighborhood issue and I'm not going to go
21 into that because we're going to have a chance to vet that very soon.

22
23 And we have an election coming up and whatever this election is I think it's going to be mild compared to
24 the election in 2016 because of the economic drivers and the social and political consequences. I hope
25 I'm going to conclude with that remark and I don't want it to be negative. It just means that's another
26 factor you need to be thinking about. I don't think the Comp Plan can address that it's the intermediate
27 planning processes and how the Council and you operate vis-à-vis the citizens that come forward. So I
28 wish you the best. I know there are a lot of people in Palo Alto who want to make this a constructive
29 process. I especially do. Thank you.

30
31 Vice-Chair Keller: Michael Griffin do you want to take any of the remaining time? Thank you. Ok, the
32 next speaker is Shani Kleinhaus to be followed by Stephen Rosenblum.

33
34 Shani Kleinhaus: Thank you. I'm Shani Kleinhaus; I'm a resident of Palo Alto and the Environmental
35 Advocate for Santa Clara Valley Audubon Society. So I'm going to talk about birds a little bit and about
36 things that concern me as a resident as well.

37
38 So one of the things that we saw in Hillary's presentation was [unintelligible] issues and it talks about
39 quality of life. So I think there is some kind of an assumption that birds and nature is part of quality of
40 life. Not that it is not, but it has its own value and that was mentioned in several of the tables there; that
41 there is an intrinsic value to nature that is not associated with human benefits or quality of life that needs
42 to be recognized. And the reason I mention that is because in the comments that I have provided
43 previously on the Natural Element of the Comprehensive Plan there were a lot of comments that we tried
44 my group to enter about how do we make this a bird friendly city? And that included how do we plant
45 and how do we trim trees and what kind of windows we have. And what do you do in the natural areas,
46 but also how do you make our City a living city not only for people? And people love birds. We have a
47 lot of birders, we have a lot of people that have a bird feeder in the back yard. We don't want to lose
48 that. This is the only connection that people still in a city can have to nature is birds. So how do you
49 improve that? That needs to be a part of the general plan or the Comprehensive Plan and not only as a
50 quality of life issue.

51
52 And I had a few other notes. So I want to go back to the four concepts and the Concept 4 that has
53 innovative net zero concept and I'm trying to figure out what that means. I don't think it's clear. I think
54 it was really good to have a story about it in the newspaper today, thank you. But it's still not clear what
55 this means and I'm not clear whether this is kind of an experiment on a citywide scale, which would be
56 really scary because it could be an outcome that is not what we expect at all. And it could be a

1 mitigation that is actually presented as a general plan and that is not right either. So I think it's really
2 interesting concept and could be done on one neighborhood. I would love to see it at East Meadow
3 Circle, which is really close to my house and I think that could be a good example, but I would not try to
4 adopt that as an alternative to a general plan or a Comprehensive Plan.
5

6 I have followed some of the processes in Mountain View very, very closely and what is going on in terms
7 of how the North Bayshore area where they have a lot of offices is going to deal with increase. And
8 there were a lot of concepts so they tried to figure out how do we stop growth of car trips, how do we
9 stop emissions, what are the other alternatives? So far a lot of creative solutions, but none of them
10 works to actually have net zero. They just don't work. So there probably is no solution like that. It
11 would be wonderful to try and find one, but not on a city scale. It has to be an experiment that is much
12 smaller in scale.
13

14 And as a resident near East Meadow Circle I just want to go back to that specific plan to that side and
15 say that I would love to see more housing there. I think that to use the Circle for housing and the center
16 for services and park would be a wonderful thing instead of what's there right now and a lot of people
17 came in the last 10 years to live there. Initially there was a response from some of the neighbors who
18 did not like it, but I see that they assimilated into the neighborhood very well and it's a really nice
19 neighborhood to have these people live there.
20

21 What else did I have? The last thing I'm going to say is something about the process. When something
22 is now decided if it's in a, an alternative is moving forward or something in the EIR is decided and we're
23 moving forward with that there is no way back almost. It's almost impossible and the people in the
24 audience might not know this, but once something moves forward going and saying well, we're only
25 studying this so let's study what the impact is, the study is not whether or not to do something, the study
26 is how to do something. So once it's in there it's not coming out. And we've had at Audubon some big
27 issues with that and did manage to get some things out of EIR's at the last moment, but it's almost
28 impossible to change a plan after it's set in motion. And the EIR will not study whether or not something
29 is a good idea, it will only study how to do it and what kind of cost it's going to cost all of us and mitigate
30 for that to some extent, not completely. Thank you.
31

32 Vice-Chair Keller: The next speaker is Stephen Rosenblum to be followed by Kevin Murray.
33

34 Stephen Rosenblum: Hi, my name's Steve Rosenblum. I live in Palo Alto as well. I just wanted to bring
35 up an issue that is a vision issue I think and belongs in this study because of its overarching effect on life
36 in Palo Alto and that is the undergrounding of Caltrain. I think to me it represents an opportunity and a
37 solution to many problems. If the Caltrain right of way were underground it would immediately improve
38 the connectivity between east and west sides of Palo Alto. People could cross the train tracks on any
39 street again the way they used to be able to before the grade crossings were there. It would create real
40 estate above the train tracks, which would be accessible to transportation. It would possibly create a
41 bikeway depending on how the land were used and also opportunities to build housing and commercial
42 depending on how it was zoned. And this is really a way of creating real estate, something which God
43 usually doesn't do except in places like Hawaii. We can actually get real estate back that is, that wasn't
44 existing.
45

46 And some of the other aspects of it, it would eliminate traffic delays that we have now at the crossings
47 leading to a lot less loss in time of people waiting and concomitantly will allow Caltrain to increase
48 frequency of service because they would no longer be limited by gate downtime. So this would enhance
49 transit in both ways, both mass transit and vehicular and pedestrian transit because of having no more
50 traffic delays. It would also eliminate accidents at grade crossings as well as suicides, which we've had
51 many in the past. And so I think that's another improvement. And it would also eliminate the train noise
52 from our environment. This would include the mechanical noise of the train as well as the horn noise,
53 which they are required to sound at every grade crossing. So that would be, improve quality of life for all
54 people living next to the tracks.
55

1 And then as a final thing it would prepare the way for undergrounding of high speed rail should it
2 eventually come to Palo Alto. And from what I'm understanding from the latest planning in contradiction
3 to what high speed rail had said early on is that they plan to retain grade crossings even when the trains
4 are going by at 125 miles an hour, which I think is not very sensible. I think it's a real threat to our
5 environment as well as to our life and limb. So I think just I commend this as an idea to the
6 consideration of the Commission and that they should consider this as part of their planning process.
7 Thank you.

8
9 Vice-Chair Keller: The next speaker is Kevin Murray to be followed by Beth Bunnenberg. Is Kevin here?
10 Ok, great. So...

11
12 Kevin Murray: Hi, Kevin Murray, 2091 Harvard. I was listening to all of the presentation, thank you. I've
13 looked at the, I've read the plans; I've had the presentation on the TV. Let me emphasize this
14 Commission, first in terms of process as a political scientist I'm disappointed to hear that you're
15 appointed by Council Members. I want you to be more independent. So maybe we can revisit that
16 process. Second, I'm not really aware of any of the people on the Commission are in any way related to
17 commercial development or attorneys related to intellectual property rights. Hopefully there's no
18 connection there either. Again, independence is critical. Because those are like the two triads that make
19 up what is driving Silicon Valley.

20
21 Of the four plans Number 2 resonates with me the most. I would even like stricter allocations however
22 with respect to Association of Bay Area Governments (ABAG) remember the more companies we allow to
23 expand in Palo Alto the more ABAG will pressure us to bring in housing. Now I know we can do plans for
24 housing, but we don't have to build the housing. So that's the good news. That's the good caveat and
25 hopefully we can stay with that.

26
27 Mr. Tanaka spoke earlier about the fact and I appreciate your comments trying to be inclusive that we
28 have to be maybe sensitive to the investment concerns of these commercial developers. Hey folks,
29 c'mon, they are here to invest and get a return. This is really about power, money, control, glory and I
30 for one as a Palo Altoan representing the citizens' voice rather than the commercial interests want to
31 preserve the quality of life we have here. In my humble opinion your only role should be focusing on
32 how do you manage the existing development rather than plan for future development. Now we're going
33 to hear a lot of survey questions discussing about look at the growth trends. I know we're living in a
34 second gold rush boom right now and have been. In fact I saw it in 1984. To me the traffic levels were
35 too bad in 1984 when I lived here, of course I've been here since 1960. In the last 15 years my God,
36 what happened to the leadership? They just, they just surrendered. They surrendered to the financial
37 interest.

38
39 Our only power is in numbers. I know that. And if we get enough of us, the people in seats, the rest of
40 the Palo Altoans here it will change, but the true change only comes with electing a whole new slate of
41 non-developers to the City Council. And then they will direct this Commission to come up with ways on
42 how to manage our existing traffic. Push the success, the financial success, which I celebrate of Silicon
43 Valley out of Palo Alto. Shift it to San Jose where it deserves the redevelopment. And for those
44 urbanites who want to have that world experience, that's great. I want to get you to move to San
45 Francisco, we want to get you to move to San Jose and enjoy those days, but for us we still want to feel
46 like we live in a community. This is the new sea change, so the closest one for a voice for the sea
47 change is Item Number 2, Item Number 2.

48
49 With respect to granny units I own three of those granny units and I applaud Mr. Keller's earlier remark.
50 Sure, if you want to rezone so some existing property owners can do granny units on their existing
51 properties that might be the one way to accommodate housing crunch. All those become an executive
52 community in terms of the pricing of real estate. The homes are nothing to applaud, but that's ok. That
53 was the World War II generation that picked up on the mass development of Middlefield. I remember
54 when Middlefield was literally a field prior to the Eichlers, but the housing values have so skyrocketed
55 that we've got to be realistic that really again note the success of the Silicon Valley really needs to be
56 pushed out to other communities not only in California, but throughout the nation. The challenge here of

1 course is, and I don't blame them venture capitalists they want to talk to one another and go across
2 town. They're all centered here and again so are the law firms and so are the startups. And they, in
3 their mind's eye they think that they need to be a part of the action and understandably the real estate
4 development says that's right and we'll facilitate that by giving them the infrastructures to succeed. We
5 know what they're doing here, but it's gotten out of control. It's beyond even reasonable.

6
7 So it is my passion and hope that the only thing that will get passed here will be Item Number 2, 2 vision.
8 And I thank you for the time it must have taken to go through all the input. So for a voice of Palo
9 Altoans who really comes from the numbers not from the domestic and foreign investment that's driving
10 the incredible expansion that I've ever seen in the history of this town this will be a voice helping to
11 coordinate a new City Council slate to redirect the direction of this Commission to plan for the existing
12 density and no more. Thanks for your time, I certainly appreciate it. Good night.

13
14 Vice-Chair Keller: The next speaker is Beth Bunnenberg to be followed by Robert Moss.

15
16 Beth Bunnenberg: Beth Bunnenberg speaking tonight as an individual. I am a Palo Alto resident. In
17 terms of vision I don't envision Palo Alto in 30 years as a collection of skyscrapers that blocks our views
18 of the coastal hills and the bay. We are locked into our present land area and there aren't any more
19 suburbs for us to annex. Therefore we must use our land very wisely.

20
21 I favor the option that actually was presented by our group at the Elks Lodge, which was a double slow;
22 slow growth on residential, slow growth on non-residential. We already have projects in the pipeline that
23 are greatly going to increase traffic and parking problems. Now history has shown that putting too many
24 people jammed together too tightly and the quality of life goes down. Already Palo Alto or at this point
25 Palo Alto has a pretty good balance between residential and parkland, but still there are traffic jams.
26 Tempers flare, people fight over parking places, and pedestrians are hurt and killed on our streets. We
27 love that parkland and yet we continue to see some threats to those parklands. I strongly recommend
28 keeping the 50 foot height limit and sticking to it. Place those 50 foot high buildings in areas such as
29 Stanford Industrial Park and the southern part of El Camino. Keep the buildings of human scale, both
30 residential and non-residential. Please accept the double slow alternative and let's keep our quality of
31 life. Thank you.

32
33 Vice-Chair Keller: The next speaker is Robert Moss to be followed by Sea Reddy.

34
35 Robert Moss: Thank you. Couple of comments, in the list of topics one of the things that's missing is the
36 potential flooding sea level rise. Under hydrology you should be considering that because it's almost
37 certain that within 20 years the sea is going to go up by more than a foot. And a rise of that amount will
38 flood most of Palo Alto between the bay and Middlefield. So talk about that, you don't just ignore it.

39
40 Second, in the hazardous materials the staff report talks about having a report from 2003. That's old
41 data. I have ones from 2005 and I know they've been issued from 2010. Furthermore, the toxic levels
42 for trichloroethene (TCE) was significantly reduced about 18 months ago. So something that would have
43 been acceptable a year, three or four years ago is not acceptable and the mitigations are different today
44 than they would have been then. Keep that in mind when you're talking about building in the California-
45 Olive-Emerson (COE) area in particular.

46
47 On the various concepts the two that I think are the most realistic are Number 1, keep the existing
48 Comprehensive Plan. We spent years getting that developed. We don't have to come up with a revised
49 Comprehensive plan for a few years. Let's live with what we've got. If you want to make some changes
50 Concept 2 makes more sense than the others. One of the things that bothers me about Concept 3 and to
51 a certain extent Concept 4 is you're talking about allowing densification within a half a mile of the transit
52 routes. ABAG is only asking for densification within a quarter mile of transit routes. A half mile would
53 include almost all of Barron Park, Evergreen Park, I could name the neighborhoods going up and down El
54 Camino, which would be impacted by increasing density along there.

1 The City Council supposedly adopted a basic principle that all existing R1 zones shall not have an increase
2 in density. That must be adhered to no ifs, no ands, no changes. Same with the 50 foot height limit.
3 There's no reason why you can't build housing within 50 feet. I could show you hundreds of housing
4 units along El Camino and other major streets that are 50 feet or less. The reason that the CN zone has
5 a lower height limit is because we wanted it to be compatible with the housing behind it in Barron Park.
6 We didn't want a 50 foot height limits.

7
8 Now when you talk about housing developments and you're asking to put in developments that have
9 studio and one bedroom units find out what the market wants because you may find the market hates
10 studio and one bedroom units. Let me give you two examples: there's a townhouse development on El
11 Camino Way just north of Charleston and there's another one on San Antonio just east of what used to
12 be Mayfield Mall. Both of those were developed with the allowed Floor Area Ratio (FAR), but between
13 half and two-thirds the number of housing units that would have been allowed. And the developers were
14 asked why do you build these big units, 2,000, 2,500 square feet? And the answer was that's what the
15 market wants. The market doesn't want 800 square foot units. The market doesn't want one bedroom
16 units. So find out what the market wants. Don't tell the market what it ought to be doing, the market's
17 going to tell you.

18
19 When you talk about changing El Camino I get very nervous because one of the things you're talking
20 about is getting all of the property owners to band together and combine lots and work as a group. Been
21 there, done that, it crashed and burned. We tried that in the Barron Park Association years ago. For any
22 25 properties along El Camino you will find there are at least 30 property owners, some of whom don't
23 talk to each other. So unless you can actually get somebody to come in and buy up the properties and
24 combine them you're not going to be doing that. You're going to have individual properties developed
25 one at a time.

26
27 And as an example there's a vacant lot just south of Matadero. It's been vacant for more than 40 years,
28 since the building that was on there burned. Jim Baer was trying to buy that and develop it as a hotel
29 about 25 years ago and found out that the person who owns it lives in Texas and the amount that she
30 wanted for it he considered grossly excessive and that was years ago, decades ago. So you're going to
31 find 4146 El Camino, which has now come in with another development and this is the fourth
32 development they've come in with that property is owned by a woman in Hong Kong. She's had two
33 projects approved. Both of them were never built. The approvals expired because she never went
34 forward and actually built them. So getting things done along El Camino is very different than getting
35 things done under normal development projects.

36
37 Vice-Chair Keller: Our final speaker unless we have additional cards is Sea Reddy.

38
39 Sea Reddy: Thanks for taking me in. I came in late. A few things that I would like this team to talk
40 about and include or consider is the Stanford Hospital expansion. Now it's Stanford and they're doing
41 what they're already doing, so how would we incorporate whatever traffic whatever things that
42 happened, 24 hour emergency services, all that so would we probably need to I'm sure you've already
43 thought about it, but I just would like to put it as a list of things that we need to talk about.

44
45 And then East Palo Alto, you know we don't live in an isolated world and I've seen this in Manhattan
46 Beach that when we had riots in 1991, Rodney King and all that, so there was Hawthorne and there was
47 Manhattan Beach. It was only two miles, very similar to here. It's only about half a mile to East Palo
48 Alto. So we need to lift up that community so that we can live peacefully as well. We're not living in an
49 isolated world, so I think we any of our planning we need to work with them; same thing with Mountain
50 View, same thing with next door, Menlo Park. So we're not in an isolated community, we... what they do
51 impacts us, what we do impacts them. I think I'm more concerned with what they do that we might be
52 able to understand. So I think that discussion like Stanford would help.

53
54 And the other one is the when I look up on the sky; you know Palo Alto is a beautiful community and all
55 that. I used to live in Newport and there are extensions in the traffic. It seemed like the planes come
56 above wherever they go I haven't researched whether they go to Oakland or San Francisco, I don't know,

1 I haven't researched it. It needs to be looked at. The more traffic that that comes through it's going to
2 break us up. An airplane unfortunately could have a mechanical damage, things like that. It's going to
3 severely impact our life. So we need to participate there, we need to give more inputs, maybe they could
4 take an alternate path later at night? But I see planes beyond 10:00, 11:00 at night, which wasn't the
5 case in Newport we had restrictions.

6
7 And then I think this is very important to me as we get older we need to have an alternate way for going
8 to the doctor. My five mile zone is Stanford and Menlo Park. We need to allow some other medical care
9 facilities other than Stanford. Not everybody can afford to go to Stanford. They are more expensive and
10 citizens might need alternative means of getting that medical care without having to drive. You know
11 when I call a taxi drive, they need to go they can take a taxi and go \$20 and go to the hospital. It's very
12 important to the community and a lot of people have a lot of money, but a lot of people don't. Seniors
13 are more frugal too and caregivers and all that that need to be considered.

14
15 The last thing is beautification of El Camino. El Camino Real is not the prettiest thing and I was totally
16 surprised when I saw what's on El Camino south of Page Mill Road. It's quite different than what we see
17 on the north side so I think we had one city, one community, I didn't really consider lifting that
18 community up like look that area up. Thank you.

19
20 Vice-Chair Keller: Speak and then you can turn in the card. So Stephen Levy you will have five minutes.

21
22 Stephen Levy: So I'm Steve Levy and I live about a block from here in Palo Alto. In terms Joanne and
23 Steve of the scoping plan, the EIR, my experience is that the analysis goes forward if you have really
24 specific alternatives. I'm sure you know that. We're at a conceptual level. You've got people arguing
25 growth or no growth, but without numbers on those four alternatives not on individual parcels, but on
26 the program you can't do your EIR, right? You can't do the impacts. And nobody here is going to know
27 what happens. So that's the first piece. You know that piece.

28
29 But there's a second issue and I've been talking to Hillary and Steve back and forth. I don't know what is
30 discretionary for the Commission and the Council, what is legal? What is legal under the existing Comp
31 Plan? That is how much growth the City can expect unless they do something that violates the law. I
32 think that will inform the discussion in the following way: it will move it to a discussion of where the best
33 locations and what are the best mitigation measures to handle the amount of growth that is legally
34 entitled now as opposed to an argument that may not be realistic about stopping growth altogether. I
35 don't know the answer, but I think going forward you all need to be informed about what is legal. I
36 remember Steven and Joanna at the last meeting I think Steven you said there's a lot of development
37 capacity generally in the City. Maybe not in Downtown, but I heard that correctly. So those two things
38 together will bring a lot of specificity to this.

39
40 Third, for the scoping plan I think the public deserves to know what it costs to do the mitigation. Ok?
41 Just saying something's there, undergrounding Caltrain is a huge expense. I think we know it, need to
42 know the cost. In terms of the alternatives I have two suggestions. One, the document you passed out
43 talks alternately about neighborhood retail and neighborhood services. I think probably the correct
44 concept to think about is services. We have a big shopping center, we have a smaller town and country,
45 most areas have a grocery store or a CVS or something. What makes those neighborhoods walkable is a
46 bank and a dry cleaner and a UPS store and a place to get a haircut and tailor, restaurants, but all of
47 those services I think we focus too much on the commute trips and not enough on reducing walkable
48 evening and daytime trips for services that people take not the commute trips.

49
50 The last point I think the half mile of bus stop or transit is not quite the best way to think about it. When
51 I see Caltrain and those people getting off they're getting off to go to jobs and it works because half of
52 them walk Downtown, half of them walk to the shuttle, half/half... a third and a third have bikes. Ok? So
53 I think if you're serious around transit to reduce the commute you'd put jobs, which goes in the face of
54 what a lot of people want. It may not be a distinction which must, with much merit because it turns out
55 the transit stations are in Downtown areas. And so you're absolutely I think want to put your housing

1 near where services and everyday retail are to really reduce as much as possible the parking and net
2 commuting of people who can then walk or bike to those services. So thank you.

3
4 Vice-Chair Keller: Thank you. Are there any more speakers who have come later? I guess not.

5
6 Chair Michael: So I'd like to thank members of the public who spoke this evening very much for your
7 thoughtful comments. It's always humbling being on a Commission in a City like Palo Alto where the
8 collective Intelligence Quotient (IQ) and knowledge base of the residents far exceeds our seven
9 appointed representatives on the Commission. I think that is instrumental in getting to the best possible
10 Comprehensive Plan Update.

11
12 Let's, we're going to close the public hearing and come back to the Commission. And I think given the
13 importance of this topic maybe we'll allow for two rounds of comments and take say up to five minutes in
14 the first round and then you don't have to talk all that time. If you have more we'll give you a second,
15 second chance. So who would like to begin? Commissioner Rosenblum.

16
17 Commissioner Rosenblum: Thank you. As opposed to the previous round I may fill up my full time and
18 have to go to the next time. I'm very passionate about this. So I wanted to divide comments into some
19 high level comments and low level comments.

20
21 On the high level side one of my personal talking points is that this Palo Alto that everyone loves and this
22 sort of halcyon notion of walkable streets and low traffic and thriving businesses and I think we had a
23 number of people come up and refer to the Palo Alto of their youth. It's a system and I think we need to
24 realize that this no growth/reduced growth in perils that system in some ways. So the Palo Alto of your
25 youth I'm sure had teachers living in Palo Alto, maybe policeman living in Palo Alto. Different people
26 could afford to live here. We have a demographic skew that now skews older and skews against young
27 working people without families. That is different from the Palo Alto of your youth. And a no growth or
28 negative growth policy exacerbates that difference. It makes it more expensive for young people to live
29 here, especially if there are no jobs for them. So they're going to live here, pay a premium to have to
30 commute somewhere else.

31
32 And the interesting thing about young people is they go out every day. When I was a young person I
33 went out probably two times a day because I ate my lunch out, ate my dinner out, maybe meet friends
34 for drinks after work. I now have a young family. I go out maybe once a week. It's very nice that once
35 a week I occasionally support our Palo Alto businesses, but they don't live off me. They live off the
36 people who go there every day. And I benefit from that because I like walking to businesses and all of
37 us do, but we are in some ways I don't want to call us free riders, but we benefit from the people who
38 support businesses intensively. And we make it more difficult for those people to go and support those
39 businesses, makes it more difficult for the businesses, which by the way are paying very high rents
40 because we restrict commercial growth. So my one plea here is to recognize that there's a system and
41 we talk about changes from the past. A big change from the past frankly is that a lot of people look the
42 same now. We're getting older and wealthier and a lot of people can't afford to live here anymore. And
43 it's not just a pity because a diverse place is I think an exciting place, but actually you need diversity to
44 support diverse businesses. So that's sort of my high level point.

45
46 One other high level point I think it's important to put us into context. I don't think that we are a major
47 city. I also don't think we're a suburb. We're an important college town. If you look at other important
48 college towns be it Pomona or Davis or San Luis Obispo and I'm only naming California college towns,
49 we're far less dense than any of them. And all of us can look up this data and see what our density is
50 versus others. Even if you get rid of all of our open space and say I'm going to double Palo Alto density
51 we're still less dense than they are. They have found solutions to make livable places with colleges, with
52 a vibrant ecosystem, manage growth in a healthy way. And so my second plea is let's use the data. It's
53 available, we always complain there's not enough data for this or that and that's true. A lot of data is
54 outdated and some data is not that useful, but there is certainly data to put this into context. So I'm
55 going to jump into the specifics, but the pleas on the high level is engage in system level thinking and
56 innovate within our context, use the data.

1
2 On the specific I think all the alternatives that have been mentioned they all are couched in sort of low
3 growth or anti-growth. I understand that there's a certain environment where there's great suspicion of
4 growth. Alternatives 3 and 4 anticipate some limited growth. I would say neither of them anticipate any
5 non-residential growth. I think that's probably wrong. I think there needs to be a scenario where jobs
6 are also created or at least explicitly addressed. Specifically Alternative 3 around the growth strategies
7 limits building height to 55 feet if additional height is used for residential. I'm not sure how the additional
8 five feet really helps to, for residential. I've also heard from a number of people that for modern
9 buildings we now have higher ground floors that a 60 foot limit is more palatable or more, makes for a
10 nicer building. I think that also should be considered. The 55 feet limit I think is just an odd limit. If
11 we're going to violate historic precedent for 50 feet then I think it should be a meaningful violation so to
12 speak. It should make a good building.

13
14 I'd also, I'd like to see something that contemplates a combination. Alternative 4 I view as orthogonal to
15 the others, which is to try to go for zero growth in trips strategy versus other growth strategies in terms
16 of building square footage. I think that can be combined to try to limit trips and have a building area
17 strategy. So I'd like to see kind of the crosstown of those. 27 University is only explicitly discussed in
18 Alternative 4. I think that's such an important parcel it has to be part I think of every plan. It's a big
19 parcel. It's Downtown. I think not talking about it is sort of an elephant in the room.

20
21 And I'll say one more thing just quickly then I'll do the rest in my second piece. I agree with Bob Moss.
22 Density drops within .25 miles of transit hubs. I think just saying .5 is kind of a cop out and the
23 usefulness of transit, dense transit oriented design using that big of a radius I think also is a bit of a cop
24 out. I think having more density but closer to transit makes more sense.

25
26 Chair Michael: Commissioner Alcheck.

27
28 Commissioner Alcheck: So one of the goals is sort of determine consensus here on the Commission's
29 thoughts? I think if your plan is to prepare a summary for Council that's similar to the summary you
30 prepared tonight you could add my name behind every single thing Commissioner Rosenblum just said in
31 the bullet point list of comments. That was like a breath of fresh air, really. I don't think I could have
32 said anything you said better than the way you said it.

33
34 We often use the word... so I'm going to take the same approach; I'm going to talk high level plea and
35 then some specifics. We often use the word developers, yeah, we often use the word developers when
36 we talk about some of the commercial projects that come our way. I really prefer the term
37 redevelopment and one of the reasons why is because I have a since distinction in my mind between infill
38 development and sprawl. And I think there's a lot of residents that are very interested in the notion of
39 environmental protection particularly when it comes to climate change. And our esteemed community
40 member Stephen Levy is here and he knows better than probably everybody in this room what sort of
41 growth California's going to see in the next 10, 20, 30 years, which is to say that he knows it's
42 astronomical. And so the solution is two things, we can create seven more Fresno's between here and
43 Los Angeles, which will devastate the environment of California.

44
45 Correct me if I'm wrong, not tonight, not at this moment in time, but I once read that California is home
46 to one of every eight Americans. It ought to be its own country. It's that massive. And when you think
47 about that out loud and you think about the growth we're about to encounter the notion of taking all of
48 this open space and running water to it and running electricity to it and paving it with concrete is
49 ludicrous. So every time I meet with an individual in this City and they express to me this notion that the
50 50 foot height limit is just daunting and they don't want to see any more homes being built and the
51 density ideas are awful I like to remind them that the growth is coming, show me where you'd like it.
52 And if you point to the Foothills of Palo Alto I'll tell you why I don't like putting it there.

53
54 And so I like to refer to the developers as redevelopers. I like the idea of redeveloping these parcels in a
55 way that enhances the density. I know that's not popular among the residentialists. I'd like to think that
56 we have a diverse Planning Commission membership here because the City Council wanted to hear

1 different points of view. I think that's why I'm on this Commission frankly. Maybe because it pays to
2 have that sort of urbanist perspective every once in a while, but I really just want to emphasize that it is
3 an environmental issue where we will grow.

4
5 And I walk Downtown, I bike Downtown more and I'd like to think that if we increase the density we'll
6 encourage greater walking and biking. I don't doubt for one minute that even if we were to triple our
7 residential development in this town there would still end up being maybe three more Fresno's on the
8 way to Los Angeles in the next 30 years. Because the truth is it doesn't matter how much we're going
9 to... the truth is our growth is probably not going to be adequate in any real way to make room for the
10 growth, the population increase. So there will be some impacts to the environment that are essentially
11 unavoidable. But that is one of the biggest components of the way that I like to look at this concept of
12 density, which is to say where do we want to put it? And I don't think it's just about well what about
13 Menlo Park and Mountain View and Sunnyvale and San Jose and San Francisco? I think every single one
14 of these communities is essentially facing the same challenge and to look at it as if we're really separate
15 is myopic in my view. I think it's the One Bay Area unfortunately. Our towns run into each other and
16 frankly when one town next door makes significant inroads or makes significant decisions it actually
17 impacts us, right? The San Antonio development is going to impact Palo Alto's traffic situation.

18
19 I'm just going to take 10 more seconds just to say that, well actually you know what I'll just wait until the
20 next round.

21
22 Chair Michael: Commissioner Tanaka.

23
24 Commissioner Tanaka: So I think we've had some really good comments from the public as well as from
25 the Commissioners on this topic. I think it's a very important question and issue that we're talking about.
26 And I think the one comment I think I've heard that I think has been pretty consistent whether it be pro-
27 growth or keeping things exactly the way they are is I think what's important is the quality of life. So I
28 think that's probably one universal goal, which I don't think there's anyone in this room that would say
29 no, no, no, I want a decrease in quality of life. I don't think anyone's going to say that. I think if
30 anything people want to increase the quality of life. And then the question of course is well, what does
31 that mean, right? Is quality of life meaning more growth or less growth? And I think Commissioner
32 Rosenblum had a very good comment in that Palo Alto from the Sixties to Seventies to Eighties has
33 grown, has changed, and that's part of the quality of life. I mean the vibrancy that we get from
34 Stanford, from the high tech companies in this area is a blessing and a large part is what made the many
35 property owners in this room wealthy to be honest. And so in terms of quality of life I think we have to
36 think about is how we get this quality of life by freezing everything. Is that how we get it? And
37 everyone basically has some of the other Commissioners had mentioned we basically slowly age into a
38 retirement community. Is that the quality of life, the high quality of life that we all are accustomed to?
39 Or is it having a diverse, vibrant city that welcomes all walks of life and allows opportunities for
40 everyone? And I'm more into the favor of I think we want a diversity that allows opportunities for all, not
41 just the privileged few who came here first. So I think that's something that we have to think about.

42
43 Now with that said I do think that having a, protecting the R1 areas makes total sense. I think we want
44 to do that. I don't think there's anyone here that's saying that we build a 100 foot skyscraper in the
45 middle of an R1 neighborhood. I mean I for one had not voted for the Maybell project mainly because it
46 was a four foot, four story building in, near a R1 neighborhood. That doesn't make a lot of sense, but so
47 I think that's something which I think protection of that makes... this is important because I think that
48 does protect quality of life. But at the same time I think everyone here enjoys having a grocery store
49 near their neighborhood, they enjoy having services near them, they enjoy being able to shop and walk
50 to those places, and I think enabling that to happen is important and enabling that to happen sometimes
51 means a certain amount of density.

52
53 And so I've heard this a lot and then I think Palo Alto's probably at least the citizens think of themselves
54 as one of the greenest places on Earth, but if you look at per capita compared to let's say a city like
55 Manhattan, that's not suggesting that we should be Manhattan, but per carbon footprint of a person in
56 Manhattan is much lower than any suburb like Palo Alto because they take transit, they don't drive,

1 there's a whole bunch of reasons why. And one of the comments I think Stephen Levy mentioned and
2 it's, I've read it in so many, from so many different areas is that jobs near transit actually reduces the
3 carbon footprint a heck of a lot more than any housing near transit. So I think having workers who
4 spend money who can support these retail services that we take for granted in our City near residential
5 neighborhoods, but not in residential neighborhoods I think is important. Because if you want the quality
6 of life that we are used to we want this quality of life that is enabled by I think the word that Rosenblum
7 used was system. We want an ecosystem that can support this kind of vibrancy in retail where we walk
8 around and get things without having to jump in our cars, which I think is actually important especially
9 since there is a large, a larger and larger older population which maybe can't drive all the time anymore.

10
11 And I think that's also why I think you know there's one thing to say well what does the market want and
12 there's another thing to think about well what does it take to keep the quality of life in Palo Alto high?
13 And that might mean smaller units so that the generation that has helped build Palo Alto and kept it
14 vibrant can stay in Palo Alto and walk to services. It also might mean smaller units so that the people
15 that pay all the sales tax and keep all these retail businesses alive so that we can go there one day a
16 week can survive. And so I think that's something that we need to think about and so anyways I'll
17 continue next time.

18
19 Chair Michael: Commissioner King.

20
21 Commissioner King: Thank you. I'm going to use my first round at least most of it primarily for
22 questions. I'd like to ask is it Joanne our consultant? Yeah, can you just explain your firm and I assume
23 you do these, have done these for multiple cities and maybe if you could just give me answers like how
24 many towns or cities you've done EIRs for in support of Comp Plans?

25
26 Ms. Jansen: Sure. I've been with the planning, PlaceWorks, which is formerly The Planning Center DC&E
27 and formerly DC&E for 15 years as of this month. And for most of that time I've been working on
28 general plans and the vast majority of general plans that I work on I also manage the preparation of the
29 EIR for that general plan. So I would say probably a dozen general plan EIRs over that time.

30
31 Commissioner King: Of all different size?

32
33 Ms. Jansen: Yeah.

34
35 Commissioner King: Ok, great, thanks. And so let's see, a question so the way I'm interested in the
36 process of where, how we got here. So now we've got the four scenarios, but within each of those
37 scenarios there are maybe four to eight different components. And so really if you were to say hey,
38 we're going to study do the math there would be hundreds of different ways you could take those
39 components and mix them, mix and match them. But what we've ended up with is four scenarios with
40 specific components, a choice of each of those four to eight components within those plans. How, why is
41 that and how is that, how does that support the process?

42
43 Ms. Jansen: It's a pretty typical process for a community to go through to do what Palo Alto has done
44 and use public input to identify the parts of the city that are most likely to change during the horizon of
45 the general plan or in Palo Alto's place the Comp Plan like what we did at Workshop Number 2 and then
46 refined in Workshop Number 3. So when we asked for that input from residents and we thought about it
47 as staff and the consultant team we came up with these six areas that are the six kind of building blocks
48 of the alternatives that are in your staff report where it seems like at least some people in some of the
49 groups from the workshops it felt comfortable saying that one or more of those areas could be a place
50 that might change over the next 15 years. And that excludes as you can see from the map that we
51 showed the vast majority of Palo Alto the R1 areas, the open space areas, so when we narrow our focus
52 to those six opportunity sites as we're terming them in this process then we can kind of just think about
53 those as the building blocks for the individual four alternatives.

54
55 When we do the analysis in the EIR it's true that there's kind of an almost an infinite way that the
56 different alternatives could be combined or recombined within those areas even if you limit it to those six

1 areas, but what we're going to need is citywide scenarios that we can compare apples to apples for
2 things like the traffic analysis for example. It is really an incomprehensible level of complexity if we were
3 to try to publish a document that looks at 6 alternatives in one area and what would that be compared to
4 12 alternatives in a different area. So we're going to be using these building blocks to put together four
5 citywide alternatives and what we're trying to do is come up with alternatives that both explore different
6 options for each one of the six areas across the four alternatives, but are also internally coherent so that
7 they make an alternative that makes sense if it was to be adopted as a whole. But just to be clear
8 there's no requirement that what's ultimately adopted has to be exactly one of the alternatives. It could
9 be a mixing and matching of different facets of the, that were considered I the alternatives or even
10 something that wasn't necessarily considered.
11

12 Commissioner King: Ok, so it's really to reduce complexity that would be just unmanageable you have to
13 do this. And with the other EIRs you then in support of other general plans, comp plans is this, is that
14 the same on each? So you come up with four alternatives or is that specific to Palo Alto?
15

16 Ms. Jansen: What's very unique to Palo Alto is that the EIR will cover all of those alternatives at the same
17 level of detail. Many cities do a very similar process as I've said, but the analysis of the alternatives
18 might come before the EIR and the City would go through the process that you're going through now to
19 identify which alternative it thinks it wants to commit to and then only study that one at a great level of
20 detail in the EIR. So Palo Alto's kind of leaving those options open much longer and getting a greater
21 level of analysis about each one of the alternatives because the EIR level of analysis that we would do if
22 a city had already selected an alternative is much greater than the level of analysis that we would do
23 earlier in the process for them while they're kind of still exploring the alternatives and thinking about
24 which one they like the best or which one they want to create as their preferred land use plan.
25

26 Commissioner King: So this is sort of the deluxe process? We're saying hey, we want to invest... ok,
27 great.
28

29 Ms. Gitelman: Could I, I'm sorry, could I just add one comment? I want to amplify a little bit on that two
30 ways. One is the reason we chose to go and the City Council supported this idea of analyzing
31 alternatives at an equal level of detail is it allows us to have a process where we're getting the kind of
32 input we've received here this evening longer into the process. So well after the draft plan and draft EIR
33 on the street we're still going to be talking about tradeoffs and options between the alternatives.
34 Typically you'd start to narrow that discussion and that engagement process much sooner in the process.
35 So that was the motivation for the process we've developed.
36

37 The other thing I wanted to mention is we're a little bit I don't know how to say this exactly, but we're
38 using our crystal ball to try and come up with alternatives that bracket a range of possible outcomes for
39 the City and the planning process. And to a large extent we're counting on the wisdom of the
40 Commission, the public, and the Council to help us structure that range well so that the plan that is
41 ultimately considered for adoption falls within that range. But I just wanted to make sure everyone
42 understood it's not a guarantee. We might get to the end of the process and if we've guessed wrong and
43 we want to do something outside the range then our EIR is going to be lacking. So we have to do a
44 good job at selecting this range of alternatives to bracket the possible impacts so that we give ourselves
45 the maximum possibility at the end of the day to proceed expeditiously to a decision. I hope that's clear,
46 that's a little bit of a (interrupted)
47

48 Commissioner King: No, I think that, yeah you just set basically the largest envelope possible so I
49 understood. Thank you.
50

51 Ms. Gitelman: Ok.
52

53 Chair Michael: Commissioner Gardias.
54

1 Commissioner Gardias: Thank you Chair. So before I get to the essence I just want to give a couple of
2 kudos to the audience and a couple of good comments because I felt about the same, so Mr. Neilson
3 Buchanan thank you very much for about your comments about dynamic plan, right? Of course it's an
4 important comment, but also data division that you recommended to Ms. Gitelman. I think that if you tie
5 it to the conversation about the business registry if we had an analyst to do queries pretty much you
6 would not need to have a business registry because a person like that probably would answer that
7 question with just running the queries out of the data. So that's one point.

8
9 The second point that the second comment I heard from Mr. Steve Rosenblum about undergrounding
10 Caltrain, which is exactly the same scenario that New York had many years ago when they were pretty
11 much redesigning Grand Central Station they were designing, they were doing this because of the
12 different objectives they just wanted to, the issue was to address the steam locomotives and that was
13 their problem, but because they were able to by engineering this they were able just to create this
14 massive value out of the, for the real estate above the train tracks in the middle of Manhattan and they
15 created this way Park Avenue. It would create automatically probably a billion dollars or maybe more for
16 Palo Alto if we did this unintelligible this and for the other adjacent municipalities. So thank you very
17 much for those comments, please come here more often.

18
19 So I want to just, I want to... yes. So I want to address a couple of specific aspects on the, from this
20 concepts that we had. So a couple of Commissioners talked about the Concept Number 4. So it looks
21 like an overlay to me as opposed to a concept itself. It has a mixture of the prescriptive designations and
22 then some policy aspects. And I because of this it's not as clear as you would like, so it may be
23 confusing for the audience and then may not be clean cut. So I would recommend just to remove it and
24 as others spoke in the same spirit create an overlay on all the other concepts and then drop some
25 aspects that are prescriptive in this so just focus on the net zero energy as opposed to planning aspect.
26 So that's about Concept Number 4.

27
28 From a perspective of Concept Number 3 I would like to we had from the couple of speakers that they
29 were against 55 feet raising they were against raising 55 limit to the 55 feet and some other, some other
30 growth elements. What I would like to just supporting this, that notion I would like to just focus on this
31 concept because it addresses development or redevelopment around the transit nodes and that's very
32 important. Other two concepts they don't have it so maybe by removing this 55 feet limit or increase of
33 the limit to 55 feet height but then as opposed to this focusing on some other areas that are
34 underdeveloped and then when I met with Steven we talk about allowing or discussing development of
35 the parking lots that is not within the Downtown Cap. That could be an opportunity for the Downtown as
36 well as the California Avenue without raising any limit. Ok? Thank you very much.

37
38 Chair Michael: Vice-Chair Keller.

39
40 Vice-Chair Keller: Thank you. So firstly I hope that we prominently indicate where people can
41 subsequently in between the meetings email their comments in and I assume they go to the this Palo
42 Alto Comp Plan or Our Palo Alto website and there are places to email your comments. So please keep
43 those cards and letters coming in folks.

44
45 The next thing is with respect to a living Comp Plan one of the things I noticed in the chart, it wasn't
46 necessarily in the it was in a more Our Palo Alto process in an earlier meeting, not tonight's meeting was
47 the idea that as the Comp Plan is created they'll be some interactive web based thing. And I think that
48 the idea of creating a highly hyperlinked, highly searchable, highly indexed, highly integrated Comp Plan
49 that allows you to explore and analyze and find the ones that are relevant I think that it's possible for
50 Palo Alto to do that. And I think if we do an excellent job we may even win and award for making a
51 Comp Plan actually accessible to the community. I would look forward to that.

52
53 So let me get into the detailed comments. First of all I would consider myself a data scientist and that
54 what I know about being a data scientist is this concept of garbage in, garbage out. If the input to your
55 data is garbage the output will be garbage. So the interesting thing is we need to make sure we have
56 hard data. I've spent several days in the last few weeks analyzing census data based on transportation

1 and such and had a number of conversations with Hillary and with Roland Rivera about this and I was
2 hoping we'd have some data about that. I'll work on that and produce some of that. But essentially one
3 of the things from that analysis is yes, when you add more housing near transit you get slightly more
4 transit use, but you get a lot more cars too. In fact a lot more cars than you get a slight increase in
5 transit use. And the idea of transit oriented housing makes sense in the East Bay where people are in
6 bedroom communities commuting to San Francisco. It's not the kind of commute patterns we have in
7 Palo Alto. Somewhere on the order of approximately 60 percent, maybe a little less than 60 percent of
8 people who live in Palo Alto work and are employed work in Palo Alto, Stanford, Menlo Park or Mountain
9 View, ok? So they're going to drive or bike or walk. And therefore what you really want to do is increase
10 walkability and increase bikeability. And in fact biking has increased dramatically over the last 10, 12
11 years more than anything else and that's pretty impressive.
12

13 Ok, a couple of things; first of all we need to think about the school impacts of growth. The
14 Comprehensive Plan is the only time when we look at development or redevelopment as Commissioner
15 Alcheck I guess he would know the term would be is the idea is this is the only time we can look at
16 school impacts. We must look at them now or we will not look at them at all. And I think we should also
17 think about a financial analysis on the City Budget because now's the time to look at that and it's not
18 typically part of an EIR process, but should be added to it.
19

20 So alluding to my question is we really need to understand for Palo Alto, not for the East Bay, how much
21 does housing near transit drive transit use versus driving, driving if you will. When you think about
22 expanding retail people want to have more opportunities for retail pushing retail making more services.
23 When we think about services probably the number one service people think about besides schools is
24 retail. Retail uses being able to walk to that and there are other things like libraries and things like that,
25 but we think about we probably use retail more than we use any other service besides schools.
26

27 I mentioned the idea of promoting bicycling and walking to work. We should have renamed the no
28 project alternative it's not do nothing. It is really business as usual. It is really growing to the maximum
29 allowed by zoning based on market pressures. That's what it really is, ok. Call it what it is. In terms of
30 Alternative 3, we should focus on transit oriented jobs, which appropriately they are slow growth and
31 service oriented housing. And just think of transit as another service. It shouldn't be elevated among
32 everything else. Really think about housing near services and I think Stephen Levy's exactly right, it's in
33 terms of all those other trips people take, not just the commute trips that are important. In terms of
34 Alternative 4 we have, we used to think in terms of no new net trips and may, can I finish Alternative 4?
35

36 So in terms of no new net trips with offsets, in other words, if you put more cars on the road get
37 somebody else's cars off the road by paying for shuttles, by particularly for our school kids. Think about
38 the more of our school kids that you get off the roads and parents driving in to school that is a significant
39 improvement. No new, net zero greenhouse gasses. Now in particular I'm not talking about no net
40 vehicle miles traveled. Vehicle miles traveled is considered as part of greenhouse gasses, ok? No new
41 net trips affects Palo Alto and it effects the traffic within Palo Alto. Net zero water and no net overflow
42 parking into the neighborhoods. To me that's the real issue of net zero and I'll continue my comments
43 later.
44

45 Chair Michael: So when I was introduced to the current Comp Plan, which was adopted in 1998 on the
46 very first section it says that there is no single vision for the City yet each Element has a beginning
47 portion which is entitled Vision. To me the lack of the single overarching vision is a fatal flaw and I think
48 it is carried out in terms of leadership of the City, of the Council, the Mayor, whatever who can't speak to
49 what the vision is. So there's this sense of it's open for debate or maybe there are seeds of mistrust.
50 And I think that I think it's critical that the Comp Plan that we adopt from now to 2030 state a clear
51 vision and not miss that opportunity. And I think part of leadership comes from listening to the public,
52 but it also may involve leading.
53

54 I think that the role of the Chair of the Planning Commission, which I've been privileged to do for half a
55 year now and will do for a while longer is in some sense to ensure that we have an effective deliberative
56 body and not to show my sort of personal opinions whenever the chance arises, but I think I'm going to

1 put on my resident hat a little bit and just say that like some of the speakers from the public I was born
2 here in 1951, I grew up here, attended Palo Alto public schools and then Stanford. I've been very
3 fortunate I could live anywhere and I sincerely believe that this is a great place to call home. In that
4 sense I may be a residentialist, but I sincerely disagree with the implications from the militant anti-
5 growth rhetoric that that faction of the voters is discussing as it relates to the Comp Plan.

6
7 On a personal level in the foreseeable future my wife and I have this lovely home in the Community
8 Center neighborhood. It's a very large house; it's now an empty nest. We may be looking to follow in
9 the steps of Stephen Levy and find a nice apartment somewhere. And I think that fact that the Comp
10 Plan is bowing to the concerns of the community and not touching the R1 allocation in our zoneable living
11 space is a mistake because when the time comes I don't think there's any inventory for me and my wife
12 to find the kind of place that we'd like to call home much as we'd like to stay in Palo Alto. That inventory
13 doesn't exist.

14
15 So in no particular sense of priority one of the concerns that comes up throughout the document,
16 different alternatives is preservation of historic character of the City. And when I first saw the Housing
17 Element Policy Number 1 of the Housing Element is preserve the character of existing neighborhoods and
18 I went somewhat berserk because I'd spent decades in large public companies trying to make decisions
19 based on data and they want character. How do you measure it? Where's the data? And then realized I
20 became a history major at Stanford when I took the course on American character. I thought ok, alright,
21 so I can get my teeth into this, but I think one of the aspects of the preservation of historic character is
22 we should allow for the creation of resources, the future view as historic because I think that that is one
23 of the things that we should do in our planning the legacy of Palo Alto.

24
25 Growth is an unfortunate metaphor to me. I agree with colleagues who note that this is a built out city.
26 Any development is infill development or even redevelopment. I think it's not although growth is not
27 what everyone uses as the catchphrase I think it's change. It's not growth it's change. And I think if you
28 think of it as change versus no change to me no change is a recipe for entropy, disaster, decline, not
29 anything that any one of us would appreciate. If we have yards we plant flowers. We grow trees. We
30 promote positive change. And I think change is good if properly managed, but it's always threatening
31 because it's change.

32
33 Density and height I think that there is many virtues in a community to critical mass relative to vibrancy,
34 walkability, utilization of infrastructure, distribution of City services and so forth. And I think in many
35 ways cities that are that allow for selectively more height, greater density can take advantage of those
36 virtues and leverage those resources which benefit many of us profoundly. My personal opinion although
37 I'm perfectly willing to follow the law is that relaxing the 50 foot height limit selectively would allow an
38 additional story going from four stories to five stories in certain neighborhoods where that may be
39 appropriate, Downtown, perhaps California Avenue, perhaps along El Camino and... can I have more
40 time? Yes I can. And so I think the sacrosanct nature of the height limit is a mistake personally. But if
41 it's the law I will follow the law, but I won't necessarily think it's a good policy.

42
43 With Stephen Levy and Greg Tanaka I served on the Infrastructure Blue Ribbon Commission (IBRC) and I
44 think that in the Comp Plan alternatives it's critical that we address the top priorities of infrastructure
45 needs. I think the Caltrain plan whether it's the trench, undergrounding, the longer we wait the more it's
46 going to cost and the longer until we have the benefit of that incredibly sensible idea. What to do with
47 the Municipal Services Center (MSC), which was by the way which was the biggest single ticket item on
48 the list of the half a billion in infrastructure items are unfunded given to IBRC to study, the MSC is going
49 to be under water not too many decades hence and that's going to be a bad thing. So where do you put
50 it? It's got emergency response resources and if there's a catastrophic earthquake and the overpasses
51 get threatened how do emergency vehicles get to put out the fires and save you? Another thing is the
52 location of City services and above ground infrastructure is clustered on the north end of town, which I
53 think is unfair in many ways to the residents who don't live in the north end of town. And perhaps City
54 Hall and the Public Safety Building should be relocated to the geographic center of the City, which is close
55 to California Avenue and maybe allow for incredible opportunity for this block to be used in a different
56 way.

1
2 Many colleagues have noted that Palo Alto likes to think of itself as special. Sometimes does planning in
3 isolation, but we're actually part of a region. And figuring out more robust processes for regional
4 collaboration with East Palo Alto, Menlo Park, Stanford, Mountain View, and so on, Los Altos is incredibly
5 important such that we have a Comprehensive Plan that dovetails with the Comprehensive Plans of the
6 adjacent communities and the regional plans.

7
8 And then finally Palo Alto likes to think of itself as a city. I did a little research, I was a lawyer once and I
9 did the legal research. It makes no difference under the law if you call yourself a city or a town. It
10 doesn't matter, but if you call yourself a city and we're like 113th largest city in the last census. We're not
11 very big, we're not very important except in our own minds. I think if you think of yourself as a city that
12 leads you to making decisions that are appropriate to cities. If you think of yourself as a town or a
13 village then maybe you go in a different direction. So I think that that self-image confusion would be
14 important to sort of work out in this version of the Comprehensive Plan because if we want to grow up as
15 a major city then you make different decisions. If we're perfectly content being a small livable town
16 that's different. And that's ok. I mean as I said I grew up here, like it here, I wouldn't have lived
17 anywhere else, but maybe someday I'll have to.

18
19 So I'll stop for now. Round 2 in maybe a different order from Round 1? Anybody primed and ready to
20 go? Vice-Chair Keller is ready.

21
22 Vice-Chair Keller: Thank you. So a couple of things; first of all there is unlimited demand for housing and
23 offices in Palo Alto. And it's certainly true that if you build it they will come. And if you allow them to
24 build it they will. And that may not be true in the same degree in other communities. And we cannot
25 quench the demand for people to live in Palo Alto and if we did allow everybody to live in Palo Alto our
26 schools would be so overcrowded that their quality would be destroyed. That's what we face if basically
27 people move here for the schools often. And people want to stay in our community. And therefore it's
28 not a matter of the idea that the market wants, it's not the market who wants big units to be built in
29 townhouses. It's the people who build the big units and want to put them in townhouses they want it
30 because it's the most profitable, but it's not our objective to tell to make things as nice for the
31 redevelopers so that they can maximize their profits. What we instead want to do is zone for what we
32 want, which is a saying that I've heard one of the Council Members use a lot. Zone for what we want.
33 And in particular the issue is that in order for Chair Michael to stay in the community we need to build the
34 kind of housing we want to build is housing he can downsize to, which is smaller units. Senior housing,
35 studios, and one bedrooms are the kind of housing that's missing and will provide the kind of diversity
36 that we think we want, that we say we want in Palo Alto.

37
38 We think in terms of height 50 feet, 55 feet. I think we need to think in terms of how many stories that
39 is also. So the reason that the suggestion was to go to 55 feet is because people think of 50 feet as
40 being four stories, but now the discussion is that they want a few extra feet more for the first story in
41 order to have higher height retail because that's what retail wants. So is 55 feet four stories? Is 60 feet
42 five stories? Well if you go to five stories then you have this short retail. So I think that the idea is to go
43 to 55 five feet but mean four stories, not five. And so think in terms of the number of stories because
44 that also affects the number, the amount of square footage.

45
46 The even if we don't build another square foot of office space there will still be an increase in jobs in Palo
47 Alto due to an intensification of jobs density. There hoteling, they're pushing people smaller and smaller
48 spaces. We saw what happened with Facebook when it was adjacent to College Terrace. They crammed
49 them in cheek to jowl and that's that trend more so than we have some law offices where people get lots
50 of space, but we also have startups in which people are crammed in cheek to jowl.

51
52 So let me make a couple of detailed comments on this. Firstly in order to think about slowing the jobs
53 growth what we really want to think about is allowing retail expansion, considering a mix of retail, and if
54 you're going to slow the growth of office space of non-residential, non-retail space then you want to think
55 about how to do it. A cap doesn't work because when you exceed the cap people say ah, you exceeded
56 the cap you're not allowing me to develop what I have the right to develop because of my zoning rights.

1 I have the right to develop to my FAR and whatever. Well and so therefore instead what you need to
2 think about is in terms of an air rights allocation. If you say you're allowed to grow so many square
3 footage more than allocate it out and make sure you leave room for TDR's. You allocate it out somebody
4 wants to build they got to buy it from somewhere. Other cities do that, they limit the amount of growth
5 by allocating air rights.

7 In terms of limiting the market the residential growth you can do that by I believe by limiting market rate
8 housing to the Regional Housing Needs Allocation (RHNA) allocation for above moderate. You're not
9 limiting Below Market Rate (BMR) housing if the BMR housing developers can build, can buy the land and
10 develop the housing they can do it without having a cap. That's the way you can, I think that that's a
11 legal process for accomplishing the limit of residential growth.

13 I think that it is very important to limit Caltrain, I'm sorry, underground Caltrain. Now I was an advocate
14 in back in 2008 before the election the Palo Alto Weekly had a stint about undergrounding Caltrain high
15 speed rail and I was the advocate for cut and cover. And there's a zippering approach where you
16 consider alternating which side you cover and do things like that in order to be able to cover most of it
17 and yet allow for the escape so it's not too expensive in terms of if there's a crash or something like that.
18 To the extent that we working with SVLG in getting money to Bay Area Rapid Transit (BART), which is
19 going to happen and we get money for Caltrain and make sure some of that money goes for grade
20 separations for Caltrain. There will be money for grade separations for the four grade separation in Palo
21 Alto. If, with that money we could either have overpasses built, a basically train going over or we could
22 figure out how to spend the additional money through a bond issue that I think would be partly paid for
23 by developing over that land to put the train underneath. And you could do that both south of Oregon
24 Expressway, but I think that we should also collaborate with Menlo Park to underground north of Oregon
25 Expressway. Now you can't underground where Oregon Expressway is because changing the
26 interchange is just too expensive, but north of Oregon Expressway into Menlo Park working with Menlo
27 Park to underground until it gets to Atherton, maybe Atherton wants to pay for undergrounding further,
28 that's a possibility. And with a cut and cover approach with the tracks the road is slightly raised over the
29 tracks, you don't have to cut under and you sort of essentially tunnel slightly under San Francisquito
30 Creek, under the El Palo Alto, which you can do because redwood trees go laterally out. Ok.

32 In terms of El Camino height limit increase we have to be careful about not next to R1 residential
33 particularly in Barron Park. There are places where the lots are deeper. There are places where the lots
34 are shallower. There are places where the shallow lots are separated from R1 housing by a narrow
35 alleyway. You don't want a 41, a 50 foot or higher canyon to be happening over towering the R1
36 properties that are often one story and sometimes two on the other side. So we have to think about
37 where you need to do that and that's why we need to have an El Camino Real, particularly South El
38 Camino Real Concept Area Plan so we can study where it makes sense for higher, where it makes sense
39 for non-higher, and where it makes sense to in fact lower the heights because you want to do it context
40 based not... you want to do it concept based, based on context not other things.

42 So let me mention the comment that was made about distribution of services around the City by
43 neighborhood. I agree with that as a thing that we need to evaluate. In terms of flooding and sea level
44 rise I think that's an important consideration particularly for the Regional Water Quality Control Plant. I
45 won't even use the expression I would use in terms of what happens if that's underwater. I think we
46 need a Fry's Area Precise Plan in order to understand that big piece of land redevelopment. It's
47 comparable to what happened when we redeveloped the Palo Alto Medical Foundation (PAMF) when it
48 moved. If SOFA deserved a precise plan which it has, in fact there are two of them for South of Forest
49 Avenue (SOFA) 1 and SOFA 2. We need one for Fry's.

51 And I'll close by asking this question, when... of staff I guess. When will we choose an alternative among
52 these four? How does that process happen for choosing an alternative among these four including the
53 mix and match along them? Because I presume that we may not take one alternative over another
54 alternative, we may pick a mix and match. So maybe you can sort of give that answer tonight.

1 Ms. Gitelman: Sure let me start and then Joanna and Steven can add on if necessary, but I think our
2 concept is that we'll continue to get input on these, on three or four concepts try and get direction from
3 the Council at some point to move them forward into the EIR analysis, carry them through to the draft
4 EIR stage, and the draft EIR will tell us what their relative merits and impacts are. So we'll understand
5 their benefits and impacts at a greater level of detail when the draft EIR is available and after the
6 comment period on the draft EIR that's when we would try and narrow it down to what our preferred
7 alternative is. And we could choose one of the alternatives. If we guessed right and one of the
8 alternatives in the range we described is it, we love it, we'll go with that. If we want to massage them
9 and choose one alternative with modifications or elements from another alternative as long as we've
10 captured the impacts of that blend in the range of alternatives we should be ok to proceed to the final
11 EIR and plan adoption. So that's the strategy for now. So if we stay on schedule we're talking about first
12 quarter of 2015 we'd be making the decision how to get down from four alternatives to one.

13
14 Chair Michael: Commissioner Alcheck.

15
16 Commissioner Alcheck: Ok, so I just wanted a few specifics. I think in the focused development
17 alternative I share the view that I think Commissioner Michael suggested which is that in those selected
18 sites I think the approach should consider a meaningful deviation from the height limit. And I know
19 we've articulated this notion of sort of a greater height on ground floor retail. I'm not sure, I'm not sure,
20 I'm not just suggesting 55 or 65 or I guess that part is open. I'm not suggesting a specific height
21 increase, just that that increase could be exceeded potentially.

22
23 I'd also like to state that I, this is a unique moment. I share Bob Moss' opinion regarding dictating
24 market preference, dictating preferences to the market. I don't believe this body or the City Council for
25 that matter has the expertise to dictate what size units should be developed in Palo Alto. I believe the
26 marketplace and the market players should have freedom and flexibility there especially because I like to
27 throw this out there I was at Planning Commissioner Academy this year and the key note speaker talked
28 about the future of transportation specifically personal vehicles. And he showed a picture of 5th Avenue
29 in 19 whatever, I can't recall, Twenties, Thirties, and then he showed a picture of it 10 years later. And
30 the picture basically represented there was a single horse and carriage on 5th Avenue and then 10 years
31 later there were probably 30 or 40 cars. And he suggested that in that 10 year span this was a just an
32 unbelievable change in the way we transported ourselves. And then he suggested that do you think that
33 the change from potentially cars we have to drive to cars that are self-driven will take that long and what
34 will that, how will that look if we depicted it in a picture? And I only mention that because he suggested
35 and potentially very accurately what would we do with all our parking garages if suddenly the cars that
36 took us everywhere didn't have to be parked because after we used them they picked up another person
37 and kept on running indefinitely. And so I was astonished after he made that comment because all I
38 kept picturing were four or five story parking garages that were suddenly empty and what would we do
39 with all our garages? Obviously that change is not going to be overnight, but I mention it because the
40 market reacts much more quickly to the needs, its own needs then I think boards and commissions and
41 councils can really determine.

42
43 And so I think part of the Our Palo Alto process will always be flawed to some extent because technology
44 is changing at a very fast pace and there will be some potentially magnificent impacts specifically in the
45 transportation, in the transportation category over the next 15 years. We're all talking about what it was
46 like 10, 15, 20 years ago and we're all making the assumption that in 15 years traffic's going to be 10
47 times worse. What if this keynote speaker, he was a Stanford professor in the business school and a
48 transportation expert, what if his predictions come true and suddenly we're all in self automated cabs
49 that we own some, have some ownership percentage, I have no idea.

50
51 But anyway in a similar vein when it comes to the discussion of rail and transportation infrastructure I'm
52 reminded of a lecture I attended by Tom Friedman at De Anza and his quote was something like if you
53 visited Grand Central Station in New York or Grand Central in New York and then you went to the Central
54 Station in Berlin you would think they won the war. Something to the effect of how we've really avoided
55 investing any money in our mass transit infrastructure. I continue to think that this high speed rail
56 discussion has a place in our Comprehensive Plan and its alternatives. And I know that there's significant

1 expenses to some of the ideas that people have mentioned and maybe even significant opportunities if
2 you think about it, but it's a huge asset to this community and so the potential changes that may come
3 from the State's investment in high speed rail. I don't know how we incorporate that, but that will
4 magnify the value of Transit Oriented Development (TOD) I think. I think if the rail was faster maybe it
5 would be even more appealing or I'm not exactly sure how to kind of put that into words, but I just think
6 there's some real innovative opportunities for discussion. I think it can be incorporated into the notion of
7 how we plan for TOD. Ok.

8
9 Chair Michael: Commissioner King I see you have some notes there?

10
11 Commissioner King: Thanks. Let's see. I've got some questions still, but I guess in keeping with the
12 theme that we want to do our big picture position statements so regarding Palo Alto as a system and
13 somehow that resulting in a compelling need for growth I think that every physical system has a
14 maximum capacity. And in our case our City has a fixed geography and there, that means there's a fixed
15 amount of how many humans and how much built stuff can exist within our City. So to ask as if growth
16 is perpetual and inevitable is not makes, is not logical. Just as if you own a home on a lot you can't keep
17 growing infinitely, indefinitely. At some point you've got enough stuff there. So I'm not saying we're
18 there, but I'm saying that growth is a choice. That's a stolen quote. And that it's a function of what's
19 here now. It's a function of the infrastructure we have, how much infrastructure we can put in, and the
20 type of zoning that we have built now. And that ultimately it's the residents should decide when is there
21 enough growth. Again, it cannot go on infinitely.

22
23 And regarding the Palo Alto as a town versus a city I call Palo Alto a town. It may be changing, but I
24 believe it to be a town. If you look at the great cities, the great transport cities they were built, they've
25 got zoning of 20 to 50 units per acre. And so that enables say Manhattan to have transit that's within a
26 five to ten minute walk of just about everybody. And so it, in that case density works great and it draws
27 the services so all residents are I think Commissioner Keller's quote was service oriented basically. The
28 issue we have here in Palo Alto, and that's true also of smaller towns along historical rail districts, along
29 Caltrain if you look at the core downtowns along Caltrain before the post war boom. If you look at Marin,
30 Larkspur, Sausalito, Fairfax, all those places have density of probably 20 to 40 units per acre. The
31 change we have, a challenge we have in Palo Alto is the bulk of the town is on 6,000 square foot lots. So
32 that's like five units per acre. And so if you as we densify the Downtown that means and therefore there
33 will always be with any density there's not 100 percent usage of transit that means that the impacts to
34 those people who live on 6,000 square foot lots and are not within a quarter mile walking distance to
35 services and transport becomes a significant burden. And so I think we have to be very careful in
36 assuming that this, the density that it, that continued density Downtown or in the identified areas is
37 manageable without horrendous impacts to those people who can't change their zoning, their on a one of
38 those 6,000 square foot lots.

39
40 I'd also say regarding the transit versus car, cars are I think I actually did the, looked at the numbers.
41 Cars are actually getting quite efficient. If you put four people in a Prius it's about as fuel efficient carbon
42 efficient as riding the train. There's an assumption amongst many people that trains and buses are
43 they're there so there must be no carbon usage, but in fact trains particularly are a big huge things that
44 need to be moved up and down tracks that burn a lot of fuel. So in my mind the non, the move to non-
45 car transport is probably more for congestion issues than it is for our carbon footprint. And so my point
46 is that where we have non-TOD here in Palo Alto the car is probably going to be the solution and
47 hopefully we can improve its efficiency.

48
49 Regarding the climate change and the densification of zoning here saving the planet or materially altering
50 climate change I'm very hopeful that that could be the case. I'd like to see that scientifically supported.
51 It may actually make more sense to have seven Fresno's built with 20 to 50 units per acre for saving the
52 planet than it does us trying to make 20 to 40, 20 to 50 units per acre in our town and therefore
53 potentially causing more and more gridlock.

54
55 And the other, ok that's my statement. Statements. Then I'd like to go back for the comments. So I
56 would like to make sure that we are considering the future of retail. I mean if you look around you see

1 how many competitors Google, I think EBay, all these competitors that are about delivering the services
2 to us rather than us going and purchasing the services so I am curious as to how we factor that into a
3 plan during which time we can expect significant changes in how we purchase and obtain goods.

4
5 And one last one; can you tell me regarding the online input for the Comp Plan is that anonymous?

6
7 Ms. Jansen: Users have to register to use the system if you want to provide a comment or respond to a
8 comment you have to register with your name and address. You don't have to have an address here in
9 Palo Alto. Anyone can register it's just a process of verifying that there is an actual person and not a
10 robot behind the input that is being received. But once the person registers they have the option of
11 displaying their name or not displaying their name.

12
13 Commissioner King: And so why would we think that that's appropriate that residents of any town can
14 have equal input on our Comp Plan?

15
16 Ms. Jansen: Sure. There's, it, there's not a restriction on registering and people from Palo Alto could
17 register and give comments on another person's site as well if they wanted to, but what there are online
18 are a number of tools if you go to the online forum and look there are tools where you can map the
19 location of any, not the specific location, but you can map the responses from inside versus outside Palo
20 Alto and that's another reason for collecting that address information.

21
22 Commissioner King: Oh that's based on the, but that's self... they're not verified by anybody.

23
24 Ms. Jansen: It's just an automatic, automated verification system that this is a legitimate address, but
25 there's not a background check to make sure that one person lives at that exact address.

26
27 Commissioner King: Ok, well that's of some concern to me because it means that we don't know really
28 who is commenting on our Comp Plan. Thank you.

29
30 Chair Michael: Commissioner Tanaka.

31
32 Commissioner Tanaka: Ok, well lots of good comments. So I have a suggestion that might help. So I've
33 been looking at the different concepts, Concept 1, 2, 3, 4. And these concepts are all very kind of like
34 zoning code based, which is not surprising. But I was thinking that rather than making zoning code
35 based maybe what we should do is make it more results based. Like what do we want out of it? So for
36 instance maybe, I mean I guess what I'm trying to say is make it more mission based. So maybe one is
37 Concept 1 although Vice-Chair Keller cynically called it the, I forgot what he called it... business as usual
38 one, ok. Concept 2 maybe is or I guess Concept 2, 3, 4 are all very similar, but basically no growth
39 whatsoever or something to that effect.

40
41 And then maybe there'd be a third concept or a fifth concept, but maybe and it's kind of a concept I'm
42 going to call like trying to maximize not for no development or de facto, but maybe trying to optimize it
43 for quality of life. And I know that's extremely subjective and it depends on who you're talking to, but I
44 think we've heard various comments on the Commission and from the attendees tonight, but what do we
45 do to maximize the quality of life? And rather than thinking about it in terms of zoning or in terms of like
46 zero development, development as it is, but what about how do we maximize quality of life? And so I
47 think that's a hard one because it's so very subjective, but I've listened to a few thoughts and these will
48 probably be controversial so I'd love to get feedback and thoughts on it, but so one of them I do think
49 that the preservation of R1 is important although I do sympathize with the fact that we need housing for
50 seniors as well as the workers, young single workers in the City, but I think that's actually kind of an
51 important tenant for the City. I think also it's important to if I and I think Vice-Chair Keller said it very
52 well earlier, which is aside from schools the service that people use most are these retail establishments.
53 I do agree that the nature of retail is changing dramatically and I think about that a lot all the time, but I
54 mean what makes I think Palo Alto great is exciting University Avenue. It's Cal Ave. it's being able to
55 walk go somewhere close without having to jump on a train or car and go up to San Francisco, right? I
56 think that's actually very important. So how do we make this robust, awesome retail experience that's

1 second to none that makes this place lively? That makes it a place that we want to live, not just a place
2 we want to retire. And so those are kind of the first two thoughts I've been thinking about in terms of
3 how do we get an awesome quality of life.
4

5 I do think preservation of really high quality schools is also important because that's a service. So I
6 guess how do you maximize kind of the top level of things how do you maximize the highest level of
7 service for everyone? And then the thing about it is how do you sustain these services? And I think so
8 there's a couple of thoughts there. So one thought is you know I think the tax base in Palo Alto is
9 actually very important. So we, the Chairman and I both served on IBRC and we know the state of our
10 infrastructure and the lack of infrastructure funds and the fact that even though we're a very wealthy city
11 as individuals, the City itself is not wealthy. I mean compared to a lot of neighboring cities it's not
12 wealthy at all. So how do you enable a robust sales tax base or tax base so that it allows us to do all of
13 the things that we want to do and have the vibrancy that we all want to live in? And so, so I think
14 thinking about how do we financially make the City strong and robust so we can do the cool things like I
15 think everyone, there's no one, I don't think there's anyone in this room who thinks that Caltrain should
16 be above ground. I don't think there's anyone here that thinks that. But the problem is that nobody has
17 a really good answer to how are you going to finance that. I mean could you finance it by selling the
18 space to make office space perhaps, but could you sell the space to... how do you turn a wish into a
19 reality? And so if we had the finances if we are able to monetize the land, if we're able to make these
20 dreams come true rather than just talk about it I think that's important. So and because it's one thing to
21 wish it or to say oh this is our preference, it's another thing to actually make it happen. And I think
22 making a super high quality of life city is something we should make happen.
23

24 And yeah, so ok. I'd love to get feedback from others on this quality of life concept.
25

26 Chair Michael: Commissioner Rosenblum.
27

28 Commissioner Rosenblum: Yeah as I mentioned I used my first session... is it on? Ah, there we go. I
29 used my first session for some large hopefully not boring but more high level concepts then moving into
30 specific input for the consultants. And I think this is a really good job and I think it's easier to engage
31 with these concepts. And I agree with Mr. Levy that it has to get more specific for it to really have teeth
32 and so my comments are really about this now.
33

34 Ideally people really are going to react to impact on traffic, parking, and then finally schools. The schools
35 bit may be outside your scope, but I want to come back to that in a second. And so what I'd love to be
36 able to see is the actual model that you use so the EIR makes mention of the Transportation Demand
37 Model. I'd like to know the inputs and outputs so what inputs and what assumptions do you use? So
38 Vice-Chair Keller brought up an excellent point. I'm glad he's doing the data research. I'd love to see
39 this that you put a building next to transit that you increase transit use slightly, but you increase car use
40 dramatically. I think that that's a difficult data point to digest because that means what if I put a building
41 there with no other policies? What if I as we do make sure we have adequate parking for all residents or
42 what if you made sure that all residents had to have Caltrain Go Pass? Would that change the dynamics?
43 Would the input change if it was optimized for younger people who tend to not have cars or people who
44 have families that tend to all have cars and have to use their cars?
45

46 I think all these things change and so I agree, garbage in, garbage out. It's a great piece of data, but I'd
47 like to see if innovative policies change the assumptions. And in particular I'd like to see the consultant's
48 models and how they handle these assumptions because I think it's very subtle. The policies that you
49 have will influence the variables that you use. I'd like to know how we understand those variables.
50

51 Even more specific again we talked about the 55 foot height limit. I completely agree again with Vice-
52 Chair Keller that probably 55 came up because people said oh, you need more height in retail ground
53 floor it's probably four stories. So it's inconsistent with the comment that the additional height should be
54 used for residential. If that is the case than it has to be even higher, if it's not the case then you're
55 talking about a three story building with additional height for residential, but even then I'm not sure it
56 actually makes sense. So that one I think go back and see what the actual logic was. I would say in the

1 right area I would support a higher height limit. Again taking Bob Moss' comment to heart, much closer
2 to transit, but again taking Arthur's comments to heart. Let's find out what happens under different
3 circumstances and policies to encourage transit use.
4

5 Next, again 27 University I would like it to be in basically all of them except the business as usual where
6 by definition it's not considered. But it's such a large and important strategically located parcel it has to
7 be considered. We need a concept that contemplates commercial growth outside of Concept Number 4.
8 Concept Number 4 I view as a pilot program to see if we can get to zero net trips or energy used or
9 some concept of zero net. That's the only way that has any commercial growth whatsoever. I think it's a
10 mistake to have no policy specific that would have an increase in commercial cap. As unpalatable as that
11 may be to some people I think it's if you're creating a solution set that goes from one end to the other
12 and we're trying to see all the impacts we're explicitly not using one of the axis, which is increased
13 commercial space.
14

15 Caltrain I had mentioned. We have Caltrain being discussed only in Option Number 3. It probably needs
16 to be again in all the options except for Number 1. Also you had mentioned it's from San Antonio to
17 Page Mill. That doesn't make a lot of sense to me, in fact if anything it's from Page Mill through
18 Downtown. And again I admire Vice-Chair Keller's knowledge of the root systems of redwoods. I think
19 that it's, it would be great if we (interrupted) [unintelligible Ms. Bunnenberg off microphone]. Oh are
20 they really? Ok, I'm glad you brought that up. I was amazed.
21

22 Ms. Bunnenberg: They were, it was searching for water.
23

24 Commissioner Rosenblum: Oh, is that so? We should feed it on suds. Ok, well (interrupted)
25

26 Ms. Bunnenberg: [Unintelligible] Yeah, so they're all [unintelligible] around those [unintelligible] that hold
27 up the bridge.
28

29 Chair Michael: So Commissioner Rosenblum has the floor. Thank you very much.
30

31 Commissioner Rosenblum: Sorry, I invited it. It's my fault. And so finally when we do this model as I've
32 asked for so I've given some specific inputs on some of the things I think need to get adjusted in the
33 scenarios. We need to rigorously annotate the assumptions. So for example the woman from the
34 Autobahn Society had made a statement saying there have been a lot of net zero proposals, none of
35 them work. I think that that's demonstrably untrue. There are net zero proposals. Stanford is in our
36 backyard and has had a net zero trips operation for 10 years. I worked at Google for a while. The
37 number of Googlers on campus has increased dramatically. The number of cars has also increased at a
38 much lower rate though through active management of these programs. So with innovative programs
39 there are things that can be done. There are programs that have worked in many areas of the country,
40 but her point is generally correct, which is there's a lot of flimflam. And so when we have the
41 assumptions it would be good to document why do we believe this is so? Who else has done it, why do
42 we believe it would work in our case, is our case like their case?
43

44 And so the final thing to come back to the things I think are the big tests the two straw men that are
45 always brought up: growth will lead to more traffic so anything around traffic just rigorous annotations I
46 want to see where the assumptions come from, and 2) growth puts unsupportable pressure on our
47 schools. We're well below the peak population of Palo Alto schools. We're well above the Nader of Palo
48 Alto schools. I'm not sure that there's a correlation necessarily between the degradation of schools
49 versus the growth or decline, but again to the extent that it can be thought of this has to be done in
50 conjunction with Palo Alto Unified School District (PAUSD). They've been very good at projecting their
51 population. I'd be shocked if they are surprised by what's going on and that the overcrowding schools in
52 inevitable and destructive, but it has to be contemplated.
53

54 Chair Michael: Commissioner Gardias.
55

1 Commissioner Gardias: Thank you very much Chair; a couple of points and then a couple of other
2 comments, but first two major points. In terms of some discussions that we had here about raising
3 height what I would like to see in all these plans, right, to giving prioritization of utilization of the existing
4 opportunities. There is so much open space in Palo Alto that taking that space and I'm talking parking
5 lots, garages, unusual lots, right, before we start considering going over limit height, which should be in
6 this sequence, right? Because otherwise if we're going to start just going over the limits and increasing it
7 it's easy of course we can do it, right? But then we would be losing that opportunity, which from the
8 planning perspective it may be an opportunity to build more of the retail space, walking area, and so
9 forth, right? I'd like to just see it as a continuous walkable spaces streets on the retail left side and right
10 side, right, as opposed to the higher buildings that have parking or garages between. So that would be
11 one of the priorities.
12

13 And then I can give a couple of examples; for example, we talked in the past about moving cars
14 underground. All this precious retail area that we have is taken by cars. In some buildings it has
15 garages underneath, but they need the ramp and ramp takes majority of the retail or the potential retail
16 area in the ground space or garages, that retail space or some other space for public should be instead.
17 So that's a great opportunity I would like just make sure that we don't miss it. Or at least this should be a
18 priority. Have this before some other heights.
19

20 There is also another opportunity that I see here in the plan in the zoning. Zoning that we have in Palo
21 Alto and zoning historically right is pretty much based on the historical, on the historical separation of
22 different land uses. That's not true today with the material and technology progress. And then also
23 different laws, you can mix them and match them as you please. And then in many areas, in many
24 municipalities mixed zoning it's standing up and then zones are not for the land separation but rather for
25 regulation of the heights or some other factors, but then larger mixed usage is allowed thus reducing a
26 number of trips, greenhouse gases commuting to the work and so forth,. And of course greater
27 utilization of the parking spaces as well.
28

29 And then so those are just two main points. A couple of other smaller items that when you prepare the
30 studies please just give us some numbers. We would like to see the consequences of all of this, all of
31 this plans that have. It would be for us easy to grasp what is the consequence of Scenario 1, 2, 3, and 4.
32 Hopefully we're going to go away with four, so one, two, and three. Quantify it and just show us some
33 numbers from the perspective of cost, additional population, and so forth. Thank you.
34

35 Chair Michael: Vice-Chair Keller.
36

37 Vice-Chair Keller: I think I already went, but I'm going to just add very two, three quick things. Ok, so
38 the first think is that it was mentioned that PAUSD at its peak 15,000 or so students. There are 24
39 elementary schools, 3 high schools, 3 middle schools. Now it's about over 12,000, which is somewhat
40 over 50 percent where the trough was if you will. There are only about a dozen elementary schools, two
41 high schools; each of these two high schools is at not quite double their original design capacity. And not
42 only that but if you look at the PAUSD projections the ones that came out in December, which I read, it
43 says they assumed no increase in housing. They can't project housing that doesn't exist. They only
44 project specific housing units. So when the housing unit is built they project for it. Before the housing
45 unit is built they don't project for it. So they actually have this drop off if you look at it showing the rate
46 of growth of the housing and what happens is that housing they basically had this nice drop off that
47 happens as the housing gets filled and students flow through the system, but they don't project out far
48 enough in terms of additional housing.
49

50 And in terms of smaller units I just want to point out that the development that's replacing Equinox and
51 We Fix Macs is small units. And so there is demand for it in certain circumstances if we zone for it.
52 Thank you.
53

54 Chair Michael: Actually before the public leaves tonight I just wanted to make a very sad announcement
55 that former Chair Eduardo Martinez who preceded me as Chair of the Planning Commission and served
56 with distinction for two terms and was recently honored by the City for service passed away last week.

1 And so he was a, he had a wonderful sense of compassion, he brought a sense of humor to discussions
2 that were often contentious and controversial and I think many of us also were honored to be his friend
3 and he is, he was a wonderful colleague. So he had a passion for good planning. Hopefully the
4 Comprehensive Plan will honor his passion and will reflect the collective wisdom of the community. He
5 worked a lot on the Land Use Element proposed revision. I would just note that perhaps the Land Use
6 Element is the place where we should identify the need for any specific plans for Downtown or specific or
7 precise plans South El Camino, East Meadow Circle, Fabian Way, and East Embarcadero.

8
9 Commenting on the alternative futures I think this has almost been completely covered by my colleagues
10 and by the public. I think that the Alternative Number 1 the do nothing or business as usual, well it just
11 left me with one big question and that's the reference, the causal reference that the Downtown
12 Development Cap would be just exceeded. I think that this is too important of a policy for that statement
13 to be left hanging there. I think that we should understand exactly what the enforcement of this policy
14 would be or if it needs to be strengthened with an ordinance or a Downtown specific plan. My personal
15 bias is the Alternative Future Number 1 is not my favorite nor is the Number 2, the slow growth. And
16 again I'm not seeing many takers in my suggestion that we substitute the metaphor of change for growth
17 because I think I'm willing to work with the concept of growth because obviously this is meaningful to
18 most of us if not all of us, but I don't think it's parsed in terms of what it actually means sufficiently. So
19 does this mean population increase? Does it mean absolute number of employees as tabulated in a
20 business registry against some ongoing metric of sorts? Does it mean non-residential square footage
21 divided further into retail and office? Does it mean housing units? But I think that if growth at some
22 level slow, slower, slowest, rapid is the topic we should be more precise.

23
24 Option Number 3, which my notes is slow development but focused housing in transit served areas I
25 think that the question that I've always had about the transit and how it serves us is that it's almost it's
26 dominated by intercity commuting transit. And it's not, doesn't recognize any particular infrastructure
27 associated with intra-city movement. And I think that one of the changes in the way we live and work is
28 that many of us don't commute intercity. This may be us being fortunate, but I think that for example
29 most of us came here probably other than Commissioner Alcheck on his skateboard we probably drove
30 here because there is no intra-city transit that is efficient. So I think if you're going to have focus on
31 transit served areas I think that we ought to broaden what transit served means. And I think it ought to
32 include intra-city transit.

33
34 And the two things that disappointed me in Number 3, which was otherwise probably my preferred
35 bucket was the notion that the ideas in the California Avenue Area Concept Plan would be validated in
36 terms of keeping California Avenue low scale. And putting off my impartial fiduciary role as Chair of the
37 Commission I would prefer to see California Avenue sort of more vibrant a little bit higher scale. And I
38 think that that would provide some more mixed use, more opportunities for retail, more leveraging of
39 transit and perhaps evening putting City Hall and the Public Safety Building there would be an
40 improvement in the allocation of resources of the City. Likewise for the what came out of the workshops
41 I was disappointed that in this notion of walkability and sort of clustering things around sort of villages
42 that are scattered around the City, places like Midtown and Charleston Plaza seem to be opportunities for
43 bolstering what's there that people could use, walk to, and maybe even allow for a little more density,
44 more height.

45
46 And I think I said pretty much everything else in the first round and I'm going to yield to Commissioner
47 Alcheck.

48
49 Commissioner Alcheck: There was one other comment I wanted to make about and you just reminded
50 me about it and I've been thinking about it all week, which is I was sort of hoping that out of the Our
51 Palo Alto meetings there would be an opportunity to explore this notion of a limitation on chain stores,
52 particularly in a California Avenue specific environment. I mention that because San Francisco has
53 implemented chain store limitations in several areas of the City and people often describe San Francisco
54 as being a retail rainforest. You look at Hayes Valley or the Mission for example you won't find stores
55 that have more than 10 locations nationwide. What that does is it changes the way an investor or a
56 developer looks at a project. They're not building it for a Chipotle or a McDonald's or a Gap, they're

1 building it for a potentially local business owner. What I'm hoping exploring that idea will do is it will
2 encourage potentially an alternative that considers growth in for example the California Avenue area,
3 mixed-use growth, but it does so in a way that alleviates some of the concern that there won't be a place
4 for our mom and pop businesses. So I just wanted to add, I'm not sure how to incorporate that in the
5 alternatives we have. I also agree with my colleagues here that there should be an alternative that
6 explores those growth options potentially with certain policies in place that affect the growth in a way
7 that is palatable. That's it.

8
9 Chair Michael: So I had forgotten to make one comment, which doesn't respond directly to your
10 alternatives and that is as one comes to study the Comp Plan it takes a while to figure out where to find
11 stuff. And what I heard from coming out of the workshops were a number of pretty articulate concerns
12 that should be in the Comp Plan and should be easy to find. And I'm not sure where they go in terms of
13 mapping them to the elements or to the alternatives that you've laid out, which may be useful for moving
14 this forward. But the concerns that I noted from the workshops and this was just in the materials that
15 everybody had, quality of life in Palo Alto, livability, dealing with traffic congestion, enhancing transit,
16 housing cost and affordability, growth management or change management, utilizing a relationship with
17 Stanford and neighboring cities, some notion of what's the target jobs/housing ratio whether that's an
18 imbalance or there's something ideal, something about the Palo Alto process and the importance of trust
19 with the public transparency, governance, engagement, and so forth I think is coming out of these
20 workshops is one of the elements in the Comp Plan. Dealing with the aging infrastructure from those of
21 us who suffered or served on IBRC; we had 300 meetings. Open space, what's the strategy relative to
22 density or lack thereof, and then Transit Demand Management, Transportation Management
23 Associations... TDM/TMA for you TLA fans. But I think that if there are key concerns we ought to figure
24 out how to map them to what we publish and so somebody who wants to focus on livability can find
25 what's relevant to that. And maybe it's in the glossary or maybe it's right up front. Maybe it's in the
26 structure of some innovative way of presenting the Comp Plan.

27
28 I'd like to thank everybody who showed up tonight who listened and commented. Thank my colleagues,
29 thank staff, consultants. I have more confidence after this evening's discussion in what will be the end
30 result than I think I've had for the last several years. So hopefully that's shared. We're about to go into
31 some housekeeping items. Maybe we'll take a five minute break while people can relocate.

32
33 Ms. Gitelman: And Chair Michael if I can just for the benefit of everybody talk about the next steps? We
34 talked about it before the August 4th City Council meeting is our next step. We're soliciting input on these
35 concepts, these four concepts between now and then. We'd love that input. We have to decide based
36 on your input this evening and the public's input this evening whether we start making changes before
37 this gets to Council. My instinct is that yes we should. We should reflect all of this and continue to
38 evolve and change these alternatives until the Council sees them. It might create some confusion
39 because we've asked people to comment on this version, but I think that's ok. We're at the part of the
40 process where all of the input we get will be valuable in starting to winnow down the ideas and get to
41 one final set of alternatives. So I thank you all for the input. I'm... we'll have to see what we can do to
42 open up the hood and get a lot of the ideas you've articulated into one or more of these concepts as they
43 move forward. Thank you.

44
45 Chair Michael: Ok, so quick break and then we'll do some housekeeping.

46
47 **Commission Action**: No action taken, provided comment and suggestions only.

From: recycler100@sonic.net [mailto:recycler100@sonic.net]
Sent: Friday, July 04, 2014 1:06 AM
To: Gitelman, Hillary
Subject: Comp plan input hiccup

Hi Hillary,

I tried to use the online tool to give input on the Comp Plan but the links I tried were broken:
<http://ourpaloalto.org/wp-content/uploads/2014/05/NaturalUrbanEnvSafety.pdf>

I believe we should have Noise and Safety as separate elements as described in the state requirements. They are such major elements with so many requirements, it's no longer appropriate to roll them into the Natural Environment element. Have we looked at urban evacuation routes in the event of major post-seismic event fires?

Egress networks? In the event something took place during peak commute times? The old Comp Plan certainly wasn't adequate, and I can't pull up the proposed.

Thanks for looking into the broken links.

If the City is looking for input, it really should continue to advertise this. Unfortunately, events of the past year have really strained trust of City actions. But people are busy leading their lives. If the City truly wants input, it needs to be a little more genuinely engaged with and responsive to residents even when the input comes in forms staff may not agree with.

On the "people have lives" subject, I have had no chance to comment on the Maybell Donald bike routes. Do you have a City link where I can see what is proposed?

Thanks,
Anne

From: Eric Rosenblum [mailto:mitericr@gmail.com]
Sent: Monday, July 14, 2014 8:26 AM
To: Gitelman, Hillary
Subject: some PAUSD assertions

Hi Hillary--

I hope all's well with you.

I would like to get your help on a small but important matter. As I had mentioned to you in our 1:1, I think that there are 2 hotbutton issues that over-ride all others in Palo Alto (ie., you can have ANY proposal, but until you address these issues, there will be no progress):

- 1) traffic and parking impact
- 2) school quality impact

Commissioner Keller made 2 statements regarding schools and one statement regarding traffic impact at the previous Commission meeting that I believe to be either erroneous or confusing.

re: schools... he stated the following:

1) PAUSD does not project their student population based on long term building projections; they only factor in population growth from projects taht have already been completed (I showed him PAUSD's reports to the contrary. They DO factor in planned buildings and regional growth trends in their projections. He still says (and I agree) that they seem to be using conservative #s)

2) Paly (and Gunn) are now at several times their original design capacity: I have no idea if this is correct. I suspect that it is a mis-leading statement, though-- they were probably designed for a much smaller student population, but their campuses can (with judicious building expansions) accommodate a much larger student population

Can your staff work with PAUSD planners to make sure that we understand their own concerns about the relationship b/t Palo Alto growth and their projections and capacity? It would be good to educate the Commission and the public.

Finally, wrt his statement about traffic: he stated that his analysis shows that "when you build a residential complex close to public transit, you get a small life in public transit usage, but you get a very large lift in automobile usage". I believe that this is a highly misleading statement.

(a) the data set that he used (census) is nowhere near fine-grained enough to make this assertion; and

(b) it probably is not enough to just plunk a building down near a transit hub; it is probably also necessary to have policy that makes transit an attractive option

I also think that this math needs testing and exposing to the Commission and public. We should know what the latest studies say about building + policy close to transit corridors.

EIR Scoping Period – Comment Card

Received

JUL 15 2014



The City of Palo Alto will prepare a programmatic Environmental Impact Report (EIR) for the Palo Alto Comprehensive Plan Update project (the Project). Public agencies and members of the general public are invited to provide comments in writing as to the significant environmental issues, reasonable alternatives, and mitigation measures to be considered in connection with the Project. Due to the time limits mandated by State law, responses must be sent at the earliest possible date, but no later than the close of the NOP review period, which runs as follows:

- Public Agencies - May 30 through June 30, 2014
- General Public - May 30 through August 6, 2014

You may submit this comment card tonight, or please send
Department of Planning
& Community Environment
Elena Lee, Senior Planner

Dept. Planning & Community Environment
250 Hamilton Avenue Palo Alto, CA 94301
Email: elena.lee@cityofpaloalto.org

See attached Comment Letter from Beth Bunnenberg,
writing as a member of the General Public and
long time resident of Palo Alto.

Re: Clarification of the CEQA Status of the
historic structure at 27 University Ave. as
a possible redevelopment site.

EIR Scoping Period-Comment Card

p.1 of 2

Re: Palo Alto Comprehensive Plan Update project

To :Elena Lee,Senior Planner,Department. Planning and Community
Environment ,City of Palo Alto CA

From: BethBunnenberg, writing as a member of the General Public

Date : July 15, 2014

Re: Clarification of the CEQA Status of the structure at 27 University Ave.,
Palo Alto,CA as a possible redevelopment site

The structure at 27 University Ave.variously known as the Hostess House / Veterans Memorial Building / Mc Arthur Park Restaurant is listed on the National Register of Historic Places and is a Cat.I structure on Palo Alto's Historic Inventory. When both these designations were made ,the structure had been located at 27 University Ave. for more than 50 years. It was originally built in Menlo Park as part of Camp Fremont in 1918. Soon thereafter World War One ended, and Camp Fremont was disassembled. This Julia Morgan designed structure was bought by the City of Palo Alto and moved to its current location to be used as the first municipally owned community center in the United States. Statements have been made that because it was moved once then it could be moved again to allow redevelopment of the land. Moving the Hostess House/ Veterans Memorial Building from its site would separate it from the site and take it away from other related structures , such as the Flag Pole on a large pedestal with brass plaques about Veterans and a Sons of the Golden West marker # 216. This complex is Palo Alto's Veterans ' Memorial. Veterans still meet for lunch and meetings at this building.

Moving the Hostess House/ Veterans Memorial Building to another location for the purpose of redevelopment could have very significant adverse environmental impacts on the historical significance of the structure .

This should be evaluated under the Secretary of Interior Standards in consultation with the State Office of Historic Preservation and under the provisions of CEQA regulations before any project is proposed for the site.

Received

JUL 15 2014

Department of Planning
& Community Environment

One solution might be to incorporate the Veterans Building as a gathering place with a small plaza leading to new structures on the remainder of the site. This would continue a similar use of the building without moving it from its site or near by flag pole , pedestal plaques and monument.

Architect: Julia Morgan was the first woman to earn a degree in Civil Engineering at the University of California in 1894 and the first woman to earn a diplome from the Ecole des Beaux Arts in Paris. She was the architect of a number of the buildings at Asilomar in Pacific Grove many other well known buildings.

Use of the Structure : Initially it was a meeting place for soldiers to meet with their families at Camp Fremont and was called the Hostess house.

Then in Palo Alto it was the Community Center with classes , meeting spaces, site of plays, programs, etc. till early 1930's. Then Palo Alto built a Community Theater and Community Center.

Next the building was leased to the Veterans organization for many years for all kinds of veterans' meetings, training sessions, social functions.

Finally the building was rehabilitated and became the Mc Arthur Park Restaurant. Veterans groups had monthly meals and meetings there.

Respectfully submitted,

Beth Bunnenberg, individual member of the public
(650) 326-3813

Beth Bunnenberg

2351 Ramona St.
Palo Alto, CA 94301

B

Ms. Leta E. Bunnenberg
2351 Ramona St.
Palo Alto, CA 94301-4132

Received

JUL 22 2014

Department of Planning
& Community Environment

EIR Scoping Period – Comment Card



The City of Palo Alto will prepare a programmatic Environmental Impact Report (EIR) for the Palo Alto Comprehensive Plan Update project (the Project). Public agencies and members of the general public are invited to provide comments in writing as to the significant environmental issues, reasonable alternatives, and mitigation measures to be considered in connection with the Project. Due to the time limits mandated by State law, responses must be sent at the earliest possible date, but no later than the close of the NOP review period, which runs as follows:

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Elena Lee, Senior Planner
Dept. Planning & Community Environment
250 Hamilton Avenue Palo Alto, CA 94301
Email: elena.lee@cityofpaloalto.org

I support Concept 2 - Policy Changes to Slow Non-Residential Development and Allow Only Modest Housing Growth. Palo Alto's city limits are set and there are no more lands to Annex. We must use the land wisely. Continuing to add large non residential buildings only make the imbalance between jobs and housing worse.

EIR Scoping Period – Comment Card



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Elena Lee, Senior Planner
Dept. Planning & Community Environment
250 Hamilton Avenue Palo Alto, CA 94301
Email: elena.lee@cityofpaloalto.org

I do not envision Palo Alto as a city of sky scrapers, such as San Francisco and San Jose. I support keeping the 50 foot height limit. Our buildings over 50' high have not stood the test of time very well for architectural beauty or earthquake safety. The 50' limit has produced attractive buildings with human scale that are much safer. Palo Alto does not need the "wind tunnels" skyscrapers. There are some "wind tunnels" already developing

EIR Scoping Period – Comment Card



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Email: elena.lee@cityofpaloalto.org

Palo Alto needs to immediately evaluate its emergency responders for Fire, earthquake, 100 year floods etc. Police, Fire Personnel, Utility Workers, Teachers (who are required to stay with their classes) now almost all live away from Palo Alto and maybe unable to get back to the City if transit and bridges fail. Palo Alto needs to provide for reasonably priced housing here for these emergency responders and their families. Our new Comp. Plan needs to set goals toward housing more of these key people to protect our citizens.

EIR Scoping Period – Comment Card



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250 Hamilton Avenue Palo Alto, CA 94301
Email: elena.lee@cityofpaloalto.org

Concept 3 lists "27 University site would be developed as a Transit Center with workforce housing." The Hostess House/Veterans Building is on the National Register of Historic Places and significant monuments are on the site. The Hostess House (McArthur Park Restaurant) is also on the Calif. State Register. This building should not be moved. In due respect to all Veterans this building should stay in place on this site. It could be a gathering place with a plaza and 50' structures of human scale for housing. This is not an area for skyscrapers. Moving the building would cause an unnecessary "significant adverse effect" on this historic structure that could not be mitigated.

EIR Scoping Period – Comment Card



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Elena Lee, Senior Planner
Dept. Planning & Community Environment
250 Hamilton Avenue Palo Alto, CA 94301
Email: elena.lee@cityofpaloalto.org

Historic Preservation sections of the Comp. Plan must be continued and in some cases strengthened to prevent degradation of some of the very elements that make Palo Alto unique. We have the variety of National Register districts from Ramona Street Downtown, Professorville, and two Eichler-Mid Century Modern districts. Also there are early 20th Century homes and buildings that date from Palo Alto's early beginnings. These give Palo Alto a sense of Place and how Palo Alto has evolved through the years. Modern replicas can not replace the real things.

EIR Scoping Period – Comment Card



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Dept. Planning & Community Environment
250 Hamilton Avenue Palo Alto, CA 94301
Email: elena.lee@cityofpaloalto.org

Preserving Palo Alto Parklands: Through the efforts of many citizens Palo Alto has acquired Parklands spread through-out the City and from the Baylands up through the Foothills. The Dedicated Parklands Ordinance must be preserved. Development forces must not "nibble away" at our parklands. Palo Alto has been a leader in ecology movements and nature preserves. The wise mix of activity centered parks, urban play areas, hiking trails etc. is a unique feature of our city's forethought and planning for land use. This is a quality of life issue.

EIR Scoping Period – Comment Card



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Elena Lee, Senior Planner
Dept. Planning & Community Environment
250 Hamilton Avenue Palo Alto, CA 94301
Email: elena.lee@cityofpaloalto.org

Traffic and Parking problems are becoming almost insurmountable already. With the large non residential development structures already approved these problems are becoming worse by the day. The intersection of Page Mill and El Camino causes back-up past Bryant St. heading west Oregon Ave. slows to a crawl many hours of the day. Middlefield is often so crowded that it is not a good north-south option. Alma St. jams up easily. Embarcadero can take 20 min. to go 4 blocks toward Town and Country. And through all of this we need safe bike routes and Safe Routes to Schools.

From: herb [mailto:herb_borock@hotmail.com]
Sent: Monday, August 04, 2014 4:03 PM
To: Council, City; Clerk, City
Subject: August 4, 2014, Council Meeting, Item #21: Comprehensive Plan EIR Scope

Herb Borock
P. O. Box 632
Palo Alto, CA 94302

August 4, 2014

Palo Alto City Council
250 Hamilton Avenue
Palo Alto, CA 94301

AUGUST 4, 2014, CITY COUNCIL MEETING, AGENDA ITEM #21
COMPREHENSIVE PLAN ENVIRONMENTAL IMPACT REPORT SCOPE

Dear City Council:

Please ensure that the agenda description for your Wednesday, August 6, 2014, meeting enables you to exercise your prerogative to determine the scope of the Draft EIR for the Comprehensive Plan, including determining the alternatives to be studied in the Draft EIR.

The choice of language in the staff report (ID #4944) ["providing feedback regarding environmental issues and alternatives"] does not make clear that the City Council as the legislative body of the lead agency for the Draft EIR has the authority and responsibility to direct staff about which alternatives to include or exclude from the scope of the EIR.

I urge you to exclude Scenario 4 because it is not a feasible alternative.

I also urge you to challenge the attitude expressed in the description for "Scenario 1: Do Nothing/Business As Usual" and the accompanying footnote no. 1 at the bottom of Page 3 of the staff report (Packet Pg. 662): "This alternative unrealistically assumes the City would not take steps to defend or replace these

caps and is intended simply to provide a baseline for comparison with other scenarios rather than speculating as to what the outcome(s) of a future planning process might be."

If the Comprehensive Plan is not updated, then the current "cap" on non-residential development would not be exceeded because exceeding the cap would violate the Comprehensive Plan.

The No Project Alternative is no different than the other alternatives as to whether it can be described or not as "speculating as to what the outcome(s) of a future planning process might be."

Further, I urge you to include a scenario that reduces the amount of non-residential development currently allowed by the existing Comprehensive Plan and Zoning Ordinance so that the adverse effects of the existing non-residential development are properly mitigated and the amount of new non-residential development does not adversely exceed the capacity of the City's traffic and parking infrastructure.

Thank you for your consideration of these comments.

Sincerely,

Herb Borock

From: Penny Ellson [mailto:pellson@pacbell.net]
Sent: Monday, August 04, 2014 4:04 PM
To: Council, City
Subject: Comp Plan EIR Alternatives Comments

Honorable Council Members,

I regret that I cannot attend to night's meeting as I will be attending a memorial service with my husband. However, I want to share a few thoughts as you proceed with the Comp Plan revision EIR process.

Request: I respectfully request that you ask staff to return to Council with specific information about the conceptual alternatives definition before they begin EIR analysis. This should be publicly vetted. The specifics that will further define the alternatives, in this particular instance, will matter quite a lot. In the interest of maintaining a completely transparent process, I think the public would appreciate that additional opportunity for review before staff commences with preparation of the EIR.

Comment 1: Impacts on schools must be carefully studied with the cooperation and partnership of PAUSD.

Comment 2: The Comp Plan Program EIR analysis should also study the impacts of known, approved General Plans, Area Specific Plans and specific approved large-scale projects in cities on our borders that will affect Palo Alto streets and other facilities. Consider, for example, the future unknown aggregate impacts of Mountain View's growing San Antonio Center and proposed high density infill projects in that area at full build-out. It's difficult to know what the Palo Alto transportation impacts of these projects will be because Mountain View did not study this though they were asked to do so.

I suspect that the same problem exists for portions of Palo Alto that abut Menlo Park, EPA, and Stanford.

Comment 3: I don't view the Net Zero option as an alternative, but rather as an overlay as has been previously discussed. Setting measurable, enforceable TDM goals is important to any of these alternatives. Identifying an effective enforcement strategy and funding it will be key to making TDM work. This will require a supportive foundation in new policies. The costs related to TDM monitoring and enforcement should be included in the impacts study. Palo Alto has done poor job enforcing TDM goals in CUPs up to this time, so I would like to understand what tools and policy support can be provided to staff to improve enforcement.

Finally, a Question: What is the Vision? What kind of city do we want in 15-20 years? How do we want to manage the shape and pace of development to achieve that vision? Perhaps I have missed it, but I don't see that vision described in the Comp Plan revision docs that I have read to

date.

Thank you for considering my comments.

With gratitude for your service,

Penny Ellson

From: herb [mailto:herb_borock@hotmail.com]
Sent: Wednesday, August 06, 2014 3:35 PM
To: Lee, Elena
Cc: Council, City; Clerk, City
Subject: Comprehensive Plan Draft EIR Scoping Comments

Herb Borock
P. O. Box 632
Palo Alto, CA 94302

August 6, 2014

Ms. Elena Lee, AICP, Senior Planner
Department of Planning and Community Environment
250 Hamilton Avenue
Palo Alto, CA 94301

COMPREHENSIVE PLAN DRAFT ENVIRONMENT IMPACT REPORT
SCOPING COMMENTS

Dear Ms. Lee:

Thank you for giving me the opportunity to comment on the scope of the Draft Program Environmental Impact Report (EIR) for the Palo Alto Comprehensive Plan.

The Draft EIR should include data on both:

(1) the built and pipeline gross floor area of non-residential development; and

(2) the built and pipeline number of housing units

for each of the following areas of the City compared to the baseline data for each area and compared to the allowable amount of development for each area as of the date of the baseline data:

1. The 1986 Downtown Study area.
2. The nine numbered areas in the 1989 Citywide Land Use

and Transportation Study. (Include for each of the nine areas the allowable non-residential development that was used to calculate the total Citywide allowable development, and include for each of those nine areas the associated allowable number of housing units.)

3. The other future study areas in the 1989 Citywide Land Use and Transportation Study.

4. The East Meadow Circle Area Concept Plan.

5. The California Avenue Area Concept Plan.

If the allowable gross floor area of non-residential development and/or the allowable number of housing units has changed since the date of the baseline data for any area, then both the allowable numbers from the date of the area study and the changed allowable numbers should be shown in the Draft EIR.

The following gross floor area and housing units components of the total pipeline numbers should be shown:

1. Projects with building permits, but not yet built.
2. Projects with planning entitlements, but without building permits.
3. Projects with planning applications, but without planning approvals.

Thank you for your consideration of these comments.

Sincerely,

Herb Borock

cc: Palo Alto City Council
Palo Alto City Clerk

William D. Ross
Karin A. Briggs
David P. Schwarz

Kypros G. Hostetter
Of Counsel

Law Offices of
William D. Ross
520 South Grand Avenue, Suite 300
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Telephone: (213) 892-1592
Facsimile: (213) 892-1519

Palo Alto Office:

400 Lambert Avenue
Palo Alto, California 94306
Telephone: (650) 843-8080
Facsimile: (650) 843-8093

File No: 1/10

August 6, 2014

VIA ELECTRONIC MAIL

City.council@cityofpaloalto.org

Honorable Nancy Shepherd, Mayor
and Members of the City Council
City of Palo Alto
250 Hamilton Avenue, 7th Floor
Palo Alto, CA 94301

Re: Continued Public Hearing; Comprehensive Plan Update Discussion of Alternative
Futures & Issues for Consideration in Environmental Impact Report Scoping
Meeting; Special Meeting Date August 6, 2014

Dear Mayor Shepherd and Members of the City Council:

The following comments are offered as those of a resident, business owner, and taxpayer of the City of Palo Alto ("City") for over 25 years.

First, after review of the Staff presentation on August 4, 2014, the recommendations concerning both Comprehensive Plan Amendments and Alternatives are offered after three public meetings involving slightly more than only 200 individuals. It is respectfully suggested that a more comprehensive involvement of the residents, taxpayers and business owners of the City is required for an adequate database to proceed forward with any recommendations concerning a Comprehensive Plan update and its concurrent environmental review.

More than twelve thousand residents of the City voted on Measure D concerning a critical land use decision of the City which was overturned. Further, the recent Santa Clara County Civil Grand Jury Report concludes that there is a lack of "transparency" among other things, concerning the availability of documentation concerning land use development decisions within the City. Given this background and the requirements of Government Code section 65033 which requires local agencies in land use decisions to make every effort possible to maximize public participation, it is suggested that the consideration of the Comprehensive Plan Update and environmental scoping be continued until a more comprehensive input is obtained by City residents, taxpayers and businesses.

This further notice and hearing process would facilitate one of the requests made by Stanford University - that there be an increased number of reasoned alternatives for the proposed Amendments to the Comprehensive Plan. Substantively, any proposed Comprehensive Plan amendment must be considered with the type and extent of environmental review to be authorized. Critical to that environmental review, whatever its scope, is the concept of “feasibility” whether to mitigation or more specifically to project alternatives.

“Feasible” is defined by CEQA Guidelines section 15364 as follows:

“Feasible” means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.

It is respectfully suggested that several of the alternatives presented would authorize greater density and intensification of use within the City that are plainly not “feasible” because of existing infrastructure of the City, its completely built-out character, and the limited ability to effectuate mitigation without excessive cost, such as widening thoroughfares to accommodate levels of traffic that would be directly associated with any increased intensity of development proposed.

One of the requirements of a legally adequate general plan is that it be internally consistent. (See, Gov. Code section 65300.5). One of the goals and policies of the prospective Plan and alternatives that is unclear is why *only* the R-1 Residential Zone is to be afforded protection. There is no rational basis nor substantial evidence presented in the Staff Analysis as to why the protection should not extend to *all* existing residential zones as they are a part of the existing environment.

Another existing legal and factual condition of the City’s land use regulations, that of affordable housing being achieved by inclusionary zoning, is not addressed at all by what is currently proposed.

The City is currently litigating the issue of its inclusionary zoning in the in lieu housing fee. See *Sterling Park, LP, etc. v. City of Palo* (2013) 57 Cal.4th 1193 (“*Sterling Park*”), remanded to the trial court, Santa Clara Superior Court Case No. 109CV15413. It is noted that there is currently a motion for summary judgment brought the Plaintiffs in the Matter scheduled for August 7, 2014. The omission of any substantive analysis of the legal constraints set forth in *Sterling Park* bears critically on the “feasibility” of the alternatives presented and their concurrent analysis under CEQA.

Honorable Nancy Shepherd, Mayor
and Members of the City Council
City of Palo Alto
August 6, 2014
Page 3

After listening to much of the public testimony at your Council proceeding of August 4, 2014 which centered on the claim for affordable housing to be provided for individuals whose connection with the City was not established consistently as to residency bears some comment. There was no testimony among *any* of those individuals as to the standards of affordability determined by the County of Santa Clara which are applicable to obligations of the City to provide zoning for the possibility of affordable housing. If anything at all, that unsubstantiated testimony is only relevant to an implementation policy for achieving defined *affordable* housing goals through rent control.

In summary, it is respectfully requested that your Council continue your consideration until there has been further public input and actual expression of support by a significant number of residents, taxpayers and businesses of the City for what is being proposed as Comprehensive Plan Amendments. Only until this occurs can it then be considered as to the type and kind of environmental review that should be pursued.

Very truly yours,

A handwritten signature in black ink, appearing to read "William D. Ross", with a stylized, cursive script.

William D. Ross

WDR:bk

A P P E N D I X B

THRESHOLDS OF SIGNIFICANCE USED IN THE ANALYSIS

MEMORANDUM

DATE February 3, 2016
TO Hillary Gitelman, Director
City of Palo Alto Planning & Community Environment Department
FROM Joanna Jansen and Alexis Mena
SUBJECT Comprehensive Plan Update Environmental Impact Report Thresholds

The Comprehensive Plan (Comp Plan) and EIR work program approved in 2006 by the City of Palo Alto City Council called for City staff to submit to the Council the significance criteria to be used for the Environmental Impact Report (EIR) for the Comprehensive Plan Update. These criteria were submitted to City Council in 2007 and are attached to this memorandum as Attachment A. The criteria were developed based on City policy and the California Environmental Quality Act (CEQA) Guidelines. The 2006 work program called for the criteria to be included in an appendix to the Comprehensive Plan and subsequently to serve as the thresholds for significance for all discretionary review projects in the city. These criteria have since been used in several City environmental documents, including the Stanford Shopping Center and Stanford Medical Center EIR.

In preparing the Comprehensive Plan Update EIR for publication in 2016, PlaceWorks, the City's lead consultant for the Comprehensive Plan Update and EIR, has revisited the 2007 thresholds for their applicability to the Comprehensive Plan Update EIR. As part of this review and in discussion with City staff, including staff from the City Attorney's office, PlaceWorks recommended revisions to the thresholds for three main reasons:

- » Some thresholds needed to be updated to reflect legislative changes, guidance from responsible agencies (such as the Bay Area Air Quality Management District), and case law since 2006.
- » Some thresholds are more appropriate for project-level EIRs, when specific projects have been proposed and detailed information is available about site plans, grading plans, building design, landscaping design, and occupancy. The Comp Plan does not propose or assume any specific development projects, so no such details are available for future development that may take place after the Comp Plan is adopted. The Comp Plan EIR is a "programmatic" or "program EIR" rather than a project-level EIR.
- » Finally, any threshold that references an impact resulting from a conflict with Comp Plan policy does not make sense to apply to an analysis of the Comp Plan itself.

The updated thresholds used in the Comprehensive Plan Update EIR are contained in Exhibit 1. The changes to the City's 2007 criteria are shown in Exhibit 2 in strikethrough underline format. The 2007 criteria are contained in Exhibit 3.

Exhibit 1: Thresholds Used in the Comprehensive Plan Update EIR

- » Aesthetics
 - Substantially degrade the existing visual character or quality of the area and its surroundings.
 - Significantly alter public viewsheds or view corridors or scenic resources (such as trees, rocks, outcroppings or historic buildings along a scenic highway).
 - Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.
 - Substantially shadow public open space (other than public open streets and adjacent sidewalks) between 9:00 a.m. and 3:00 p.m. from September 21 to March 21.
- » Air Quality
 - Conflict with or obstruct implementation of the applicable air quality plan, such as the *2010 Clean Air Plan* or the *2001 Ozone Attainment Plan*.
 - Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
 - Expose sensitive receptors to substantial pollutant concentrations.
 - Create objectionable odors affecting a substantial number of people.
- » Biological Resources
 - Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
 - Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, including federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
 - Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
 - Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Chapter 8.10).
 - Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan.
- » Cultural Resources
 - Adversely affect a historic resource listed or eligible for listing on the National and/or California Register, or listed on the City's Historic Inventory.
 - Eliminate important examples of major periods of California history or prehistory.
 - Cause damage to an important archaeological resource as defined in §15064.5 of the CEQA Guidelines.
 - Disturb any human remains, including those interred outside of formal cemeteries.
 - Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

- Directly or indirectly destroy a local cultural resource that is recognized by City Council resolution.
- » Geology, Soils, and Seismicity
 - Expose people or structures to substantial adverse effects including the risk of loss, injury or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic related ground failure (including liquefaction), landslides, or expansive soil.
 - Expose people or property to major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques.
 - Be located on a geologic unit or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
 - Cause substantial erosion or siltation.
- » Greenhouse Gas Emissions and Climate Change
 - Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
 - Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.
 - Expose people or structures to the physical effects of climate change, including but not limited to flooding, public health, wildfire risk, or other impacts resulting from climate change.
- » Hazards and Hazardous Materials
 - Create a significant hazard to the public or the environment as a result of the routine transport, use or disposal of hazardous materials.
 - Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
 - Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼-mile of an existing or proposed school.
 - Create a significant hazard to the public or the environment from existing hazardous materials contamination by exposing future occupants or users of the site to contamination either in excess of soil and groundwater cleanup goals developed for the site or from location on listed hazardous materials sites compiled pursuant to Government Code Section 65962.5.
 - Expose people or structures to a significant risk of loss, injury or death involving wildland fires.
 - Result in a safety hazard from a public airport for people residing or working within the project area.
 - Impair implementation of or physically interfere with an adopted emergency response or evacuation plan.
 - For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
- » Hydrology and Water Quality
 - Violate any water quality standards or waste discharge requirements.
 - Substantially degrade or deplete ground water resources or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

- Substantially increase the rate, volume, or flow duration of storm water runoff or alter the existing drainage pattern of the site or area, including altering the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site, including increased in-stream erosion.
 - Result in stream bank instability.
 - Significantly increase the rate, volume, or flow duration of storm water runoff in a manner which would result in new or increased flooding on-or off-site, or exceedance of the capacity of existing or planned storm water drainage systems in local streams.
 - Provide substantial additional sources of pollutants associated with urban runoff or otherwise substantially degrade surface or ground water quality.
 - Substantially impede or redirect flood flows through placement of structures within the 100-year flood hazard area.
 - Expose people or structures to a significant risk or loss, injury or death involving flooding by placing housing or other development within a 100-year flood hazard area or a levee or dam failure inundation area.
 - Inundation by seiche, tsunami, or mudflow.
- » Land Use and Planning
- Substantially adversely change the type or intensity of existing or planned land use patterns in the area.
 - Be incompatible with adjacent land uses or with the general character of the surrounding area, including density and building height.
 - Conflict with established residential, recreational, educational, religious, or scientific uses of an area.
 - Conflict with any applicable City land use plan, policy or regulation (including, but not limited to the Comprehensive Plan, CAP, or the City's Zoning Ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
 - Physically divide an established community.
 - Conflict with an applicable habitat conservation plan or natural community plan.
- » Noise
- Cause the average 24-hour noise level (L_{dn}) to increase by 5.0 decibels (dB) or more in an existing residential area, even if the L_{dn} would remain below 60 dB.
 - Cause the L_{dn} to increase by three dB or more in an existing residential area, thereby causing the L_{dn} in the area to exceed 60 dB.
 - Cause an increase of three dB or more in an existing residential area where the L_{dn} currently exceeds 60 dB.
 - Result in indoor noise levels for residential development to exceed an L_{dn} of 45 dB.
 - Expose persons to or generate excessive groundborne vibrations or groundborne noise levels.
 - Expose people to noise levels in excess of established State standards.
 - Exposure of people to or generation of noise levels in excess of standards established in the General Plan or the Municipal Code, or applicable standards of other agencies.
 - A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.
- » Population and Housing
 - Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).
 - Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.
 - Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.
 - Create a substantial imbalance between employed residents and jobs.
- » Public Services and Recreation
 - Result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional fire protection facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional police protection facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional parks and recreation facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional library facilities in order to maintain acceptable performance standards.
- » Transportation and Traffic
 - Cause an intersection to drop below its level of service standard, or if it is already operating at a substandard level of service, deteriorate by more than a specified amount.
 - Cause a roadway segment to drop below its level of service standard, or deteriorate operations that already operate at a substandard level of service.
 - Cause a freeway segment or ramp to operate at LOS F or contribute traffic in excess of 1 percent of segment capacity to a freeway segment or ramp already operating at LOS F.
 - Impede the development or function of planned pedestrian or bicycle facilities.
 - Increase demand for pedestrian and bicycle facilities that cannot be met by existing or planned facilities.
 - Impede the operation of a transit system as a result of congestion.
 - Create demand for transit services that cannot be met by current or planned services.
 - Create the potential demand for through traffic to use local residential streets.
 - Create an operational safety hazard.
 - Result in inadequate emergency access.

- » Utilities and Service Systems
 - Need new or expanded entitlements for water supplies.
 - Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project.
 - Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.
 - Exceed wastewater treatment requirements of the Regional Water Quality Control Board.
 - Result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
 - Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project.
 - Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.
 - Require or result in the construction of new stormwater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
 - Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project.
 - Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.
 - Be served by a landfill with insufficient permitted capacity.
 - Not comply with federal, State, and local statutes and regulations related to solid waste.
 - Result in a substantial increase in natural gas and electrical service demands that would require the new construction of energy supply facilities and distribution infrastructure or capacity enhancing alterations to existing facilities.

Exhibit 2: Changes to the City's 2007 Criteria

The following thresholds are used in the Comprehensive Plan Update EIR. Changes to the City's 2007 criteria are shown below in ~~strikethrough~~ and underline:

- » Aesthetics (~~Visual Resources~~)
 - Substantially degrade the existing visual character or quality of the area and its surroundings.
 - Significantly alter public view sheds or view corridors or scenic resources (such as trees, rocks, outcroppings or historic buildings along a scenic highway roadway).
 - ~~Require substantial terrain modifications that degrade the visual character of the site.~~
 - ~~Allow for new development that would violate existing Comprehensive Plan policies regarding visual resources.~~
 - Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.
 - Substantially shadow public open space (other than public open streets and adjacent sidewalks) between 9:00 a.m. and 3:00 p.m. from September 21 to March 21.
- » Air Quality
 - Violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation, as indicated by the following:
 1. Direct and/or indirect operational emissions that exceed the Bay Area Air Quality Management District (BAAQMD) criteria air pollutants of 80 pounds per day and/or 15 tons per year for nitrogen oxides (NO_x) reactive organic gases (ROG), and fine particulate matter of less than 10 microns in diameter (PM₁₀); or
 2. Carbon monoxide (CO) concentrations exceeding the State Ambient Air Quality Standard of nine parts per million (ppm) averaged over eight hours or 20 ppm for one hour (as demonstrated by CALINE4 modeling, which would be performed when a) project CO emissions exceed 550 pounds per day or 100 tons per year; or b) project traffic would impact intersections or roadway links operating at level of Service (LOS) D, E or F or would cause LOS to decline to D, E or F; or c) project would increase traffic volumes on nearby roadways by 10% or more).
 - Expose sensitive receptors to substantial pollutant concentrations, ~~or the general public to substantial levels of toxic air contaminants (TAC) where:~~
 1. Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million; or
 2. Ground level concentrations of non-carcinogenic TACs would result in a hazard index greater than one (1) for the MEI; or
 - ~~Does not implement all applicable construction emission control measures recommended in the Bay Area Air Quality Management District CEQA Guidelines (Table 2); or~~
 - Conflict with or obstruct ~~with implementation of the~~ applicable air quality plan, such as the 2000 2010 Clean Air Plan, or the 2001-2010 Ozone Attainment Plan, or the 2005 Bay Area Ozone Strategy.
 - Create objectionable odors affecting a substantial number of people.

- » Biological Resources
 - Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
 - Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, including federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
 - Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
 - Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or Result in a substantial adverse effect to any "protected tree" as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10).
 - Conflict with the provisions of an adopted or applicable Habitat Conservation Plan, or Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.
- » Cultural Resources
 - Adversely affect a historic resource listed or eligible for listing on the National and/or California Register, or listed on the City's Historic Inventory.
 - Eliminate important examples of major periods of California history or prehistory.
 - Cause damage to an important archaeological resource as defined in §15064.5 of the CEQA Guidelines.
 - Disturb any human remains, including those interred outside of formal cemeteries.
 - Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
 - Directly or indirectly destroy a local cultural resource that is recognized by City Council resolution.
- » Geology, Soils, and Seismicity
 - Expose people or structures to substantial adverse effects including the risk of loss, injury or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic related ground failure (including liquefaction), landslides, or expansive soil.
 - Expose people or property to major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques.
 - Be located on a geologic unit or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
 - Cause substantial erosion or siltation.
- » Greenhouse Gas Emissions
 - Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
 - Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

- Expose people or structures to the physical effects of climate change, including but not limited to flooding, public health, wildfire risk, or other impacts resulting from climate change.
- » Hazards and Hazardous Materials
 - Create a significant hazard to the public or the environment as a result of the routine transport, use or disposal of hazardous materials.
 - Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
 - ~~Construct a school on a property that is subject to hazards from~~ Emit hazardous materials or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school ~~contamination, emissions or accidental release.~~
 - For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
 - Create a significant hazard to the public or the environment from existing hazardous materials contamination by exposing future occupants or users of the site to contamination either in excess of soil and groundwater cleanup goals developed for the site or from location on listed hazardous materials sites compiled pursuant to Government Code Section 65962.5.
 - Expose people or structures to a significant risk of loss, injury or death involving wildland fires.
 - Result in a safety hazard from a public airport for people residing or working within the project area.
 - Impair implementation of or physically interfere with an adopted emergency response or evacuation plan.
- » Hydrology and Water Quality
 - Inundation by seiche, tsunami, or mudflow.
 - Substantially impede or redirect flood flows through placement of structures within the 100-year flood hazard area.
 - Substantially degrade or deplete ground water resources or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.
 - Substantially increase the rate, volume, or flow duration of storm water runoff or alter the existing drainage pattern of the site or area, including altering the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site, including increased in-stream erosion.
 - Significantly increase the rate, volume, or flow duration of storm water runoff in a manner which would result in new or increased flooding on- or off-site, or exceedance of the capacity of existing or planned storm water drainage systems in local streams.
 - Provide substantial additional sources of pollutants associated with urban runoff or otherwise substantially degrade surface or ground water quality.
 - Expose people or structures to a significant risk or loss, injury or death involving flooding by placing housing or other development within a 100-year flood hazard area or a levee or dam failure inundation area.
 - Result in stream bank instability.
 - Violate any water quality standards or waste discharge requirements.

- » Land Use and Planning
 - Conflict with any applicable habitat conservation plan or natural community plan.
 - Substantially adversely change the type or intensity of ~~overall~~ existing or planned land use patterns in the area.
 - Be incompatible with adjacent land uses or with the general character of the surrounding area, including density and building height.
 - Conflict with established residential, recreational, educational, religious, or scientific uses of an area.
 - Conflict with any applicable City land use plan, policy or regulation (including, but not limited to the Comprehensive Plan, CAP, or the City's Zoning Ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
 - Physically divide an established community.
- » Noise
 - ~~Result in instantaneous noise levels of greater than 50 dB in bedrooms or 55 dB in other rooms in areas with an exterior Ldn of 60 dB or greater.~~
 - ~~Generate construction noise exceeding the daytime background Leq at sensitive receptors by 10 dBA or more.~~
 - Exposure of people to or generation of noise levels in excess of standards established in the General Plan or the Municipal Code, or applicable standards of other agencies.
 - A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
 - For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.
 - For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.
 - Cause the average 24-hour noise level (L_{dn}) to increase by 5.0 decibels (dB) or more in an existing residential area, even if the L_{dn} would remain below 60 dB.
 - Cause the L_{dn} to increase by three dB or more in an existing residential area, thereby causing the L_{dn} in the area to exceed 60 dB.
 - Cause an increase of three dB or more in an existing residential area where the L_{dn} currently exceeds 60 dB.
 - Result in indoor noise levels for residential development to exceed an L_{dn} of 45 dB.
 - Expose persons to or generate excessive groundborne vibrations or groundborne noise levels.
 - Expose people to noise levels in excess of established State standards.
- » Population and Housing
 - Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).
 - Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.

- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.
- Create a substantial imbalance between employed residents and jobs.
- » Public Services and Recreation
 - ~~Result in an adverse physical impact from the construction of additional fire, police, recreational or school facilities, such as stations, parks or schools in order to maintain acceptable performance standards.~~
 - Result in an adverse physical impact from the construction of additional school facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional fire protection facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional police protection facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional parks and recreation facilities in order to maintain acceptable performance standards.
 - Result in an adverse physical impact from the construction of additional library facilities in order to maintain acceptable performance standards.
- » Traffic and Transportation
 - ~~Cause queuing impacts based on a comparative analysis between the design queue length and the available queue storage capacity. Queuing impacts include, but are not limited to, spillback queues at project access locations; queues at turn lanes at intersections that block through traffic; queues at lane drops; queues at one intersection that extend back to impact other intersections, and spillback queues on ramps.~~
 - Cause an intersection to drop below its level of service standard, or if it is already operating at a substandard level of service, deteriorate by more than a specified amount.
 - Cause a roadway segment to drop below its level of service standard, or deteriorate operations that already operate at a substandard level of service.
 - Cause a freeway segment or ramp (for each direction of traffic) to operate at LOS F or contribute traffic in excess of 1% of segment capacity to a freeway segment or ramp already operating at LOS F.
 - ~~Cause any change in traffic that would increase the Traffic Infusion on Residential Environment (TIRE) index by 0.1 or more on a local or collector~~ Create the potential demand for through traffic to use local residential streets.
 - ~~Result in inadequate on-site parking capacity.~~
 - Impede the development or function of planned pedestrian or bicycle facilities.
 - Increase demand for pedestrian and bicycle facilities that cannot be met by existing or planned facilities.
 - Impede the operation of a transit system as a result of congestion.
 - Create demand for transit services that cannot be met by current or planned services.
 - Create the potential demand for through traffic to use local residential streets.
 - Create an operational safety hazard.
 - Result in inadequate emergency access.

» Utilities and Service Systems

- Comply with federal, state, and local statutes and regulations related to solid waste.
- Need new or expanded entitlements for water supplies.
- Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project.
- Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.
- Exceed wastewater treatment requirements of the Regional Water Quality Control Board.
- Result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project.
- Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.
- Require or result in the construction of new stormwater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project.
- Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.
- Be served by a landfill with insufficient permitted capacity.
- Result in a substantial increase in natural gas and electrical service demands that would require the new construction of energy supply facilities and distribution infrastructure or capacity enhancing alterations to existing facilities.

ENVIRONMENTAL CRITERIA USED BY THE CITY OF PALO ALTO

Aesthetics (Visual Resources)

A visual impact is considered significant if the project will:

- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Significantly alter public view sheds or view corridors or scenic resources (such as trees, outcroppings or historic buildings along a scenic roadway); or
- Require substantial terrain modifications that degrade the visual character of the site; or
- Allow for new development that would violate existing Comprehensive Plan policies regarding visual resources; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area; or
- Substantially shadow public open space (other than public streets and adjacent sidewalks) between 9:00 a.m. and 3:00 p.m. from September 21 to March 21

Air Quality

An air quality impact is considered significant if the project will:

- Violate an ambient air quality standard or contribute substantially to an existing or projected air quality violation as indicated by the following:
 1. Direct and/or indirect operational emissions that exceed the Bay Area Air Quality Management District (BAAQMD) criteria air pollutants of 80 pounds per day and/or 15 tons per year for nitrogen oxides (NO) reactive organic gases (ROG), and fine particulate matter of less than 10 microns in diameter (PM₁₀); or
 2. Carbon monoxide (CO) concentrations exceeding the State Ambient Air Quality Standard of nine parts per million (ppm) averaged over eight hours or 20 ppm for one hour (as demonstrated by CALINE4 modeling, which would be performed when a) project CO emissions exceed 550 pounds per day or 100 tons per year; or b) project traffic would impact intersections or roadway links operating at level of Service (LOS) D, E or F or would cause LOS to decline to D, E or F; or c) project would increase traffic volumes on nearby roadways by 10% or more) or
- Create objectionable odors affecting a substantial number of people; or
- Expose sensitive receptors or the general public to substantial levels of toxic air contaminants (TAC) where:
 1. Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million; or
 2. Ground-level concentrations of non-carcinogenic TACs would result in a hazard index greater than one (1) for the MEI; or

- Does not implement all applicable construction emission control measures recommended in the *Bay Area Air Quality Management District CEQA Guidelines* (Table 2); or
- Conflict with or obstruct with implementation of the *2000 Clean Air Plan*, *The 2001 Ozone Attainment Plan*, or the *2005 Bay Area Ozone Strategy*.

Biological Resources

A biological resources impact is considered significant if the project will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations; or
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, including federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means; or
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or
- Result in a substantial adverse effect to any “protected tree” as defined by the City of Palo Alto’s Tree Preservation Ordinance (Municipal Code Section 8.10) or
- Conflict with any applicable habitat conservation plan or natural community plan.

Cultural Resources

A cultural resources impact is considered significant if the project will:

- Adversely affect a historic resource listed or eligible for listing on the National and/or California Register, or listed on the City’s Historic Inventory; or
- Eliminate important examples of major periods of California history or prehistory; or
- Cause damage to an important archaeological resource as defined in §15064.5 of the CEQA Guidelines; or
- Disturb any human remains, including those interred outside of formal cemeteries; or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature, or
- Directly or indirectly destroy a local cultural resource that is recognized by City Council resolution.

Energy

Pursuant to CEQA Guidelines §15126.4(a) and Appendix F (Energy Conservation), EIRs must include a discussion of the potential energy impacts of proposed projects with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary

consumption of energy. Impacts are assessed based on an evaluation of consumption of energy by the project. Development generally results in the consumption of energy in three forms: 1) the fuel energy consumed by construction vehicles; 2) bound energy in construction materials such as asphalt, steel, concrete, pipes, and manufactured or processed materials such as milled lumber and glass; and 3) operational use of energy by future businesses for transportation, equipment operation, and cooling of buildings. Construction materials and the operational use of energy should be addressed.

Geology, Soils and Seismicity

A geologic or seismic impact is considered significant if the project will:

- Expose people or structures to substantial adverse effects including the risk of loss, injury or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic related ground failure (including liquefaction), landslides, or expansive soil; or
- Expose people or property to major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques; or
- Be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse; or
- Cause substantial erosion or siltation.

Hazardous Materials

Note: Some of the thresholds below can also be dealt with under a topic heading of Public Health and Safety if the primary issues are related to a subject other than hazardous material use.

A hazardous materials impact is considered significant if the project will:

- Create a significant hazard to the public or the environment as a result of the routine transport, use or disposal of hazardous materials; or
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; or
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school; or
- Construct a school on a property that is subject to hazards from hazardous materials contamination, emissions or accidental release; or
- Create a significant hazard to the public or the environment from existing hazardous materials contamination by exposing future occupants or users of the site to contamination either in excess of soil and ground water cleanup goals developed for the site or from location on listed hazardous materials sites compiled pursuant to Government Code Section 65962.5; or
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires; or

- Result in a safety hazard from a public airport for people residing or working within the project area; or
- Impair implementation of or physically interfere with an adopted emergency response or evacuation plan.

Hydrology

A drainage and water quality impact is considered significant if the project will:

- Substantially impede or redirect flood flows through placement of structures within the 100-year flood hazard area; or
- Substantially degrade or deplete ground water resources or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level; or
- Substantially increase the rate, volume, or flow duration of storm water runoff or alter the existing drainage pattern or the site or area, including altering the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site, including increased in-stream erosion;
- Significantly increase the rate, volume, or flow duration of storm water runoff in a manner which would result in new or increased flooding on-or off-site, or exceedance of the capacity of existing or planned storm water drainage systems in local streams; or
- Provide substantial additional sources of pollutants associated with urban runoff or otherwise substantially degrade surface or ground water quality; or
- Expose people or structures to a significant risk or loss, injury or death involving flooding by placing housing or other development within a 100-year flood hazard area or a levee or dam failure inundation area; or
- Result in stream bank instability; or
- Violate any water quality standards or waste discharge requirements.

Land Use

A land use impact is considered significant if the project will:

- Adversely change the type or intensity of overall existing or planned land use patterns in the area; or
- Be incompatible with adjacent land uses or with the general character of the surrounding area, including density and building height; or
- Conflict with established residential, recreational, educational, religious, or scientific uses of an area; or
- Convert prime farmland, unique farmland, or farmland of statewide importance (farmland) to non-agricultural use; or
- Conflict with any applicable City land use plan, policy or regulation (including, but not limited to the Comprehensive Plan, coordinated area plan, or the City's

Zoning Ordinance) adopted for the purpose of avoiding or mitigating an environmental effect; or

- Physically divide an established community.

Noise

A noise impact is considered significant if the project will:

- Cause the average 24 hour noise level (Ldn) to increase by 5.0 decibels (dB) or more in an existing residential area, even if the Ldn would remain below 60 dB; or
- Cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB; or
- Cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB; or
- Result in indoor noise levels for residential development to exceed an Ldn of 45 dB; or
- Result in instantaneous noise levels of greater than 50 dB in bedrooms or 55 dB in other rooms in areas with an exterior Ldn of 60 dB or greater; or
- Expose persons to or generate excessive groundborne vibrations or groundborne noise levels; or
- Expose people to noise levels in excess of established state standards; or
- Generate construction noise exceeding the daytime background Leq at sensitive receptors by 10 dBA or more.

Population and Housing

Population and housing impacts are considered significant if the project will:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere; or
- Create a substantial imbalance between employed residents and jobs; or
- Cumulatively exceed regional or local population projections.

Public Service

A public service impact is considered significant if the project will:

- Result in an adverse physical impact from the construction of additional fire, police, recreational or school facilities, such as stations, parks or schools in order to maintain acceptable performance standards.

Transportation

A traffic impact is considered significant if the project will:

- Cause a local (City of Palo Alto) intersection to deteriorate below Level of Service (LOS) D; or
- Cause a local intersection already operating at LOS E or F to deteriorate in the average control delay for the critical movements by four seconds or more, and the critical volume/capacity ratio (V/C) value to increase by 0.01 or more; or
- Cause a regional intersection to deteriorate from an LOS E or better to LOS F; or
- Cause a regional intersection already operating at LOS F to deteriorate in the average control delay for the critical movements to increase by four seconds or more, and the critical V/C value to increase by 0.01 or more; or
- Cause queuing impacts based on a comparative analysis between the design queue length and the available queue storage capacity. Queuing impacts include, but are not limited to, spillback queues at project access locations; queues at turn lanes at intersections that block through traffic; queues at lane drops; queues at one intersection that extend back to impact other intersections, and spillback queues on ramps; or
- Cause a freeway segment (for each direction of traffic) to operate at LOS F or contribute traffic in excess of 1% of segment capacity to a freeway segment already operating at LOS F; or
- Impede the development or function of planned pedestrian or bicycle facilities; or
- Impede the operation of a transit system as a result of congestion; or
- Create an operational safety hazard; or
- Cause any change in traffic that would increase the Traffic Infusion on Residential Environment (TIRE) index by 0.1 or more on a local or collector residential street; or
- Result in inadequate on-site parking capacity; or
- Result in inadequate emergency access.

Utilities and Service Systems

A utility impact is considered significant if the project will:

- Exceed wastewater treatment requirements of the Regional Water Quality Control Board; or
- Require or result in the construction of new storm water or wastewater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects; or
- Result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments; or
- Need new or expanded entitlements for water supplies; or
- Be served by a landfill with insufficient permitted capacity; or
- Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project; or

- Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.

A P P E N D I X C

AIR QUALITY AND GREENHOUSE GAS EMISSIONS MODELING

Criteria Air Pollutant & GHG Emissions Summary

PALO ALTO - COMPREHENSIVE PLAN GHG EMISSIONS INVENTORY (City Only)

Notes: Based on emissions generated by land uses in the City. Excludes lifecycle emissions, municipal emissions that are not associated with land uses (e.g., utility operations), and stationary sources that are regulated by BAAQMD.

Forecasting BAAQMD's GHG Target				Forecasting based on the original 1990 inventory GHG Target			
Year	2020	2030	2050	Year	2020	2030	2050
MTCO ₂ e/SP:	6.6	4.0	1.3	MTCO ₂ e/SP:	711,840	427,104	142,368
Target Based on:	AB 32	B-30-15	S-03-05	Target Based on:	AB 32	B-30-15	S-03-05
% Reduction for Year:	0%	40%	80%	% Reduction for Year:	0%	40%	80%
Target:	1990 Levels	40% Below 1990 Levels	80% Below 1990 Levels	Target:	1990 Levels	40% Below 1990 Levels	80% Below 1990 Levels
						421,842	(5,262)
							41%

CITY MTCO ₂ e/Year											
SECTORS	1990 ^a	Existing 2014	Percent of Total	AB 32 Year 2020	Percent of Total	Scenario 1 (2030 BAU) - NO PROJECT	Percent of Total	Scenario 2	Percent of Total	Scenario 3	Percent of Total
Transportation	331,840	329,296	63%	284,141	59%	209,599	50%	206,278	50%	210,486	50%
Residential (Natural Gas and Electricity)	190,000	57,265	11%	58,398	12%	62,721	15%	62,721	15%	64,376	15%
Nonresidential (Natural Gas and Electricity)	190,000	96,869	19%	106,368	22%	112,578	27%	112,578	27%	109,813	26%
Waste (fugitive)		6,300	1%	6,854	1%	7,163	2%	6,943	2%	7,128	2%
Water/Wastewater		823	0%	810	0%	810	0%	810	0%	810	0%
Other - Offroad Equipment		28,964	6%	26,671	6%	27,043	6%	26,728	6%	26,920	6%
Total Community Emissions	711,840	519,517	100%	483,242	100%	419,914	100%	416,058	100%	419,533	100%
Change from Existing						(99,603)		(103,459)		(99,984)	
Percent Change from Existing						-19%		-20%		-19%	
Service Population		161,145		175,320		183,225		177,595		182,335	
MTCO ₂ e/SP		3.22		2.76		2.29		2.34		2.30	
BAAQMD GHG GP Threshold (PLAN LEVEL)		NA		6.6		4.0		4.0		4.0	
BAAQMD Permitted Sources (not included in Total)											
City Facilities		12,932									
Stanford University		234,097									
Total Permitted		247,029									
Change from 2014 MTCO ₂ e											
SECTORS				AB 32 Year 2020	Percent Change	Scenario 1 (2030 BAU) - NO PROJECT	Percent Change	Scenario 2	Percent Change	Scenario 3	Percent Change
Transportation				-45,154	-14%	-119,697	-36%	-123,017	-37%	-118,810	-36%
Residential (Natural Gas and Electricity)				1,133	2%	5,457	10%	5,457	10%	7,112	12%
Nonresidential* (Natural Gas and Electricity)				9,498	10%	15,709	16%	15,709	16%	12,943	13%
Waste				554	9%	863	14%	643	10%	828	13%
Water/Wastewater				-13	-2%	-13	-2%	-13	-2%	-13	-2%
Other - Offroad Equipment				-2,293	-8%	-1,921	-7%	-2,237	-8%	-2,044	-7%
Total Community Emissions				-36,275	-7%	-99,603	-19%	-103,459	-20%	-99,984	-19%

Notes:

Emissions forecasts for the non-transportation sectors are based on changes in housing units (residential energy), population (area sources), employment (nonresidential energy, area sources), or service population (waste, water/wastewater).

Transportation. EMFAC2014 (exhaust) and Hexagon using the VTA regional model.

Energy. Energy use based on a four year (2011-2014) average provided by Palo Alto Utilities.

Water/Wastewater. Includes fugitive emissions from wastewater processing associated with water/wastewater treatment and conveyance. Water use and wastewater demand is estimated based on data from the Palo Alto Utilities and forecasts from the Palo Alto Utility's 2010 Urban Water Management Plan.

Waste. CARB Landfill Emissions Tool Version 1_2013 and CalRecycle. Forecast waste generation based on three year average (2010-2012) waste commitment for the City of Palo Alto obtained from CalRecycle. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.1.

Other Sources. OFFROAD2007. Estimated based on population (Landscaping), employment (Light Commercial Equipment), and construction building permits (Construction) for Palo Alto as a percentage of Santa Clara County. Excludes BAAQMD permitted sources. Daily construction emissions multiplied by 347 days/year to account for reduced/limited construction activity on weekends and holidays.

Lifecycle: The GHG emissions inventory for CEQA is not a consumption-based emissions inventory. While the BAAQMD is updating the regional emissions inventory for the Bay Area utilizing a consumption-based emissions methodology, life cycle emissions are not included in the GHG emissions analysis for CEQA purposes in accordance with the Governor's Office of Planning and Research (SB 97 Final Statement of Reasons) and the California Air Pollution Control Officer's Association (GHG Thresholds Whitepaper).

GHG emissions are based on the global warming potentials (GWPs) contained within the Intergovernmental Panel on Climate Change's (IPCC) Second Assessment Report. The IPCC has since come out with updated GWPs in their Fourth (2007) and Fifth (2013) Assessment Reports. However, BAAQMD's per capita significance criteria is based on the older GWPs in the SAR. Consequently, to maintain consistency with the modeling and thresholds currently used for CEQA assessments, this inventory utilizes the GWPs in IPCC's Second Assessment Report.

Permitted sources are based on data from BAAQMD for year 2011 emissions. City permitted sources exclude the landfill and the wastewater treatment plant to avoid double-counting. Only emissions associated with land uses in the City are included in the community emissions inventory.

a. The 1990 inventory is based on the inventory prepared for the 2015 Earth Day Report for the transportation and energy sectors with the revised transportation-related GHG missions factors and VMT modeled by Fehr & Peers.

PALO ALTO- CRITERIA AIR POLLUTANT INVENTORY CITY ONLY

	2014 - lbs/day			
SECTORS	ROG	NO _x	PM ₁₀	PM _{2.5}
Transportation	327	1,396	315	135
Energy - Residential (Natural Gas)	32	272	22	22
Energy - Nonresidential (Natural Gas)	54	489	37	37
Area Sources (Consumer Products)	1,050	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	283	308	35	34
Other (Construction Equipment)	169	1,112	68	68
Total	1,914	3,577	477	296
	2014 - tons/year			
SECTORS	ROG	NO _x	PM ₁₀	PM _{2.5}
Transportation	57	242	55	23
Energy - Residential (Natural Gas)	6	50	4	4
Energy - Nonresidential (Natural Gas)	10	89	7	7
Area Sources (Consumer Products)	192	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	52	56	6	6
Other (Construction Equipment)	29	193	12	12
Total	345	630	84	52

	2030 Existing Land Uses - lbs/day			
SECTORS	ROG	NO _x	PM ₁₀	PM _{2.5}
Transportation	104	281	304	124
Energy - Residential (Natural Gas)	32	272	22	22
Energy - Nonresidential (Natural Gas)	54	489	37	37
Area Sources (Consumer Products)	1,050	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	283	308	35	34
Other (Construction Equipment)	169	1,112	68	68
Total	1,691	2,463	466	286
	2030 - tons/year			
SECTORS	ROG	NO _x	PM ₁₀	PM _{2.5}
Transportation	18	49	53	22
Energy - Residential (Natural Gas)	6	50	4	4
Energy - Nonresidential (Natural Gas)	10	89	7	7
Area Sources (Consumer Products)	192	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	52	56	6	6
Other (Construction Equipment)	29	193	12	12
Total	306	437	82	50

PALO ALTO- CRITERIA AIR POLLUTANT INVENTORY

	Scenario 1 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	113	276	329	135
Energy - Residential (Natural Gas)	35	298	24	24
Energy - Nonresidential (Natural Gas)	63	569	43	43
Area Sources (Consumer Products)	1,194	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	319	355	40	40
Other (Construction Equipment)	169	1,112	68	68
Total	1,893	2,610	505	309
Change from 2014 Land Uses	202	148	39	24
	Scenario 1- tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	20	48	57	23
Energy - Residential (Natural Gas)	6	54	4	4
Energy - Nonresidential (Natural Gas)	11	104	8	8
Area Sources (Consumer Products)	218	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	58	65	7	7
Other (Construction Equipment)	29	193	12	12
Total	343	464	89	55
Change from 2014 Land Uses	37	27	7	4
	Scenario 2 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	111	271	324	132
Energy - Residential (Natural Gas)	35	298	24	24
Energy - Nonresidential (Natural Gas)	59	540	41	41
Area Sources (Consumer Products)	1,194	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	311	340	38	38
Other (Construction Equipment)	169	1,112	68	68
Total	1,880	2,561	496	303
Change from 2014 Land Uses	189	98	30	18
	Scenario 2 - tons/year			
SECTORS	19	NO_x	PM₁₀	PM_{2.5}
Transportation	19	47	56	23
Energy - Residential (Natural Gas)	6	54	4	4
Energy - Nonresidential (Natural Gas)	11	99	7	7
Area Sources (Consumer Products)	218	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	57	62	7	7
Other (Construction Equipment)	29	193	12	12
Total	341	455	87	54
Change from 2014 Land Uses	34	18	5	3

PALO ALTO- CRITERIA AIR POLLUTANT INVENTORY

	Scenario 3 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	114	277	331	135
Energy - Residential (Natural Gas)	36	306	25	25
Energy - Nonresidential (Natural Gas)	59	540	41	41
Area Sources (Consumer Products)	1,238	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	320	349	39	39
Other (Construction Equipment)	169	1,112	68	68
Total	1,935	2,584	504	308
Change from 2014 Land Uses	244	121	38	22

	Scenario 3 - tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	20	48	57	23
Energy - Residential (Natural Gas)	7	56	5	5
Energy - Nonresidential (Natural Gas)	11	99	7	7
Area Sources (Consumer Products)	226	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	58	64	7	7
Other (Construction Equipment)	29	193	12	12
Total	351	459	88	54
Change from 2014 Land Uses	44	22	7	4

	Scenario 4 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	112	274	327	134
Energy - Residential (Natural Gas)	37	314	25	25
Energy - Nonresidential (Natural Gas)	63	569	43	43
Area Sources (Consumer Products)	1,284	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	328	358	40	40
Other (Construction Equipment)	169	1,112	68	68
Total	1,992	2,627	504	310
Change from 2014 Land Uses	302	164	38	24

	Scenario 4 - tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	19	47	57	23
Energy - Residential (Natural Gas)	7	57	5	5
Energy - Nonresidential (Natural Gas)	11	104	8	8
Area Sources (Consumer Products)	234	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	60	65	7	7
Other (Construction Equipment)	29	193	12	12
Total	361	467	88	55
Change from 2014 Land Uses	55	30	7	4

Notes:

Transportation. EMFAC2014 (exhaust+ tire and break wear) and Hexagon using the VTA regional model.

Energy. Energy use based on a four year (2011-2014) average provided by Palo Alto Utilities.

Area Sources. OFFROAD2007. Estimated based on population (Landscaping) and employment (Light Commercial Equipment) for Palo Alto as a percentage of Santa Clara County. Excludes BAAQMD permitted sources. Does not include emissions from wood-burning fireplaces.

Other Sources. OFFROAD2007. Estimated based on construction building permits (Construction) for Palo Alto as a percentage of Santa Clara County. Daily construction emissions multiplied by 347 days/year to account for reduced/limited construction activity on weekends and holidays.

Non-Transportation Model Inputs for the Palo Alto Comprehensive [Buildout Stats](#)[forecast](#)

	City Only					Estimate
	CEQA Baseline - City only	Scenario 1 (Existing CP - 2030 BAU)	Scenario 2	Scenario 3	Scenario 4 (ABAG Housing)	AB 32 Target Year
	2014	2030	2030	2030	2030	2020 (ABAG)
Housing Units	28,545	31,265	31,265	32,090	32,965	29,110
Population	65,685	72,285	72,285	74,120	76,140	70,500
Employment	95,460	110,940	105,310	108,215	110,940	104,820
Service Population	161,145	183,225	177,595	182,335	187,080	175,320
Jobs-Housing	3.3	3.5	3.4	3.4	3.4	

Growth Rates from Baseline

	City	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
Housing Growth Rate	1.00	1.10	1.10	1.12	1.15	1.02
Population Growth Rate	1.00	1.10	1.10	1.13	1.16	1.07
Employment Growth Rate	1.00	1.16	1.10	1.13	1.16	1.10
Service Population Growth Rate	1.00	1.14	1.10	1.13	1.16	1.09

BAU Forecasts

	City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
Electricity Use						
Residential Electricity (Kwh) ¹	156,444,763	171,352,093	171,352,093	175,873,618	180,669,175	159,541,322
Commercial + Industrial + City + Other Electricity (Kwh) ²	791,308,655	919,628,977	872,959,506	897,040,290	919,628,977	868,897,687
Total Electricity (Kwh)	947,753,417	1,090,981,070	1,044,311,599	1,072,913,908	1,100,298,152	1,028,439,009

Source

1 Provided by Palo Alto (2014). Projected based on increase in housing units. Based on a four-year average of 2011 to 2014 data.

2 Provided by Palo Alto (2014). Projected based on increase in employment. Based on a four-year average of 2011 to 2014 data.

BAU Forecasts

	City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
Natural Gas Use						
Residential Natural Gas (Therms) ¹	10,772,937	11,799,470	11,799,470	12,110,827	12,441,053	10,986,169
Commercial + Industrial + City + Other Natural Gas (Therms) ²	18,223,591	21,178,768	20,103,985	20,658,558	21,178,768	20,010,442
Total Natural Gas (Therms)	28,996,528	32,978,238	31,903,455	32,769,385	33,619,822	30,996,612

Source

1 Provided by Palo Alto (2014). Projected based on increase in housing units. Based on a four-year average of 2011 to 2014 data.

2 Provided by Palo Alto (2014). Projected based on increase in employment. Based on a four-year average of 2011 to 2014 data.

Non-Transportation Model Inputs for the Palo Alto Comprehensive

[Buildout Stats](#)[forecast](#)

	City Only					Estimate
	CEQA Baseline - City only	Scenario 1 (Existing CP - 2030 BAU)	Scenario 2	Scenario 3	Scenario 4 (ABAG Housing)	AB 32 Target Year
	2014	2030	2030	2030	2030	2020 (ABAG)
Housing Units	28,545	31,265	31,265	32,090	32,965	29,110
Population	65,685	72,285	72,285	74,120	76,140	70,500
Employment	95,460	110,940	105,310	108,215	110,940	104,820
Service Population	161,145	183,225	177,595	182,335	187,080	175,320
Jobs-Housing	3.3	3.5	3.4	3.4	3.4	

Growth Rates from Baseline

Housing Growth Rate
Population Growth Rate
Employment Growth Rate
Service Population Growth Rate

City	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
1.00	1.10	1.10	1.12	1.15	1.02
1.00	1.10	1.10	1.13	1.16	1.07
1.00	1.16	1.10	1.13	1.16	1.10
1.00	1.14	1.10	1.13	1.16	1.09

BAU Forecasts**Water Conveyance**

Water (AF/year)
Water (gallons/year)

City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
11,374	11,194	11,193	11,194	11,195	11,192
3,706,077,880	3,647,630,936	3,647,219,466	3,647,565,890	3,647,912,680	3,647,053,197

Source

Total water generation for Palo Alto is provided by the City Utilities. Forecasts are adjusted for increases in population and employment and are based on the Target per capita Sbx7-7¹ in the 2010 Urban Water Management Plan based on residential and non-residential growth.

BAU Forecasts**Wastewater Treatment**

Wastewater (gallons/year)
Wastewater (gallons/day)

City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
3,101,757,797	3,052,841,322	3,052,496,947	3,052,786,883	3,053,077,124	3,052,357,790
8,497,967	8,363,949	8,363,005	8,363,800	8,364,595	8,362,624

Source

¹ Indoor water use is 100 percent wastewater.

BAU Forecasts**Solid Waste Generation**

Waste Generation (tons/year)
Waste Generation ADC (tons/year)
Total Waste Disposal (tons/year)

City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
45,482	51,714	50,125	51,463	52,802	49,483
2,593	2,948	2,858	2,934	3,010	2,821
48,075	54,662	52,983	54,397	55,812	52,304

Source

CalRecycle. Disposal Reporting System (DRS): Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. Accessed May 19, 2015. <http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx>. 2013 is based on an average 2011-2013 disposal rates. Projected based on Service Population.

Comparison of the Change in Service Population and VMT in the Plan Area

Category	Existing	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Population	65,685	72,285	72,285	74,120	76,140
Percent Change in Population	NA	10.0%	10.0%	12.8%	15.9%
Employment	95,460	110,940	105,310	108,215	110,940
Total Service Population (SP)	161,145	183,225	177,595	182,335	187,080
Percent Change in SP	NA	13.7%	10.2%	13.1%	16.1%
VMT/Day	2,937,470	3,220,310	3,169,290	3,233,930	3,194,250
Percent Change in VMT per day	NA	9.6%	7.9%	10.1%	8.7%
VMT/Person/Day	44.72	44.55	43.84	43.63	41.95
Percent Change in VMT/SP/Day	NA	-0.4%	-2.0%	-2.4%	-6.2%
VMT per SP per Day	18.23	17.58	17.85	17.74	17.07
Percent Change in VMT/SP/Day	NA	-3.6%	-2.1%	-2.7%	-6.3%

Notes: Average VMT per trip and total trips is provided by Hexagon. Population and employment numbers do not exactly match the numbers shown in Chapter 3, Project Description, of this Draft EIR due to rounding of households and non-residential square feet, on which population and employment estimates were based.

PALO ALTO - COMPREHENSIVE PLAN GHG EMISSIONS INVENTORY

Notes: Based on emissions generated by land uses in the City and SOI. Excludes lifecycle emissions, municipal emissions that are not associated with land uses (e.g., utility operations), and stationary sources that are regulated by BAAQMD.

Forecasting BAAQMD's GHG Target			
Year	2020	2030	2050
MTCO ₂ e/SP:	6.6	4.0	1.3
Target Based on:	AB 32	8-30-15	5-03-05
% Reduction for Year:	0%	40%	80%
Target:	1990 Levels	40% Below 1990 Levels	80% Below 1990 Levels

CITY + SOI MTCO ₂ e/Year												
					Scenario 1 (2030 BAU) - NO							
SECTORS	Existing 2014	Percent of Total	AB 32 Year 2020	Percent of Total	PROJECT	Percent of Total	Scenario 2	Percent of Total	Scenario 3	Percent of Total	Scenario 4	Percent of Total
Transportation	394,661	66%	302,989	58%	265,088	54%	256,873	53%	260,962	53%	258,102	53%
Residential (Natural Gas and Electricity)	66,342	11%	72,803	14%	74,126	15%	74,126	15%	75,791	15%	77,536	16%
Nonresidential (Natural Gas and Electricity)	102,319	17%	112,081	21%	118,423	24%	118,423	24%	115,658	24%	118,423	24%
Waste	7,101	1%	7,782	1%	8,089	2%	7,869	2%	8,054	2%	8,240	2%
Water/Wastewater	1,012	0%	1,073	0%	1,073	0%	1,073	0%	1,073	0%	1,073	0%
Other - Offroad Equipment	29,573	5%	27,282	5%	27,658	6%	27,343	6%	27,535	6%	27,721	6%
Total Community Emissions	601,008	100%	524,010	100%	494,458	100%	485,707	100%	489,074	100%	491,095	100%
Change from Existing					(106,550)		(115,301)		(111,934)		(109,913)	
Percent Change from Existing					-18%		-19%		-19%		-18%	
Service Population	181,635		199,050		206,910		201,280		206,020		210,765	
MTCO ₂ e/SP	3.31		2.63		2.39		2.41		2.37		2.33	
BAAQMD GHG GP Threshold (PLAN LEVEL)	NA		6.6		4.0		4.0		4.0		4.0	
BAAQMD Permitted Sources (not included in Total)												
City Facilities	12,932											
Stanford University	234,097											
Total Permitted	247,029											
			Change from 2014 MTCO ₂ e									
					Scenario 1 (2030 BAU) - NO							
SECTORS			AB 32 Year 2020	Percent Change	PROJECT	Percent Change	Scenario 2	Percent Change	Scenario 3	Percent Change	Scenario 4	Percent Change
Transportation			-91,672	-23%	-129,573	-33%	-137,788	-35%	-133,699	-34%	-136,559	-35%
Residential (Natural Gas and Electricity)			6,461	10%	7,784	12%	7,784	12%	9,449	14%	11,194	17%
Nonresidential* (Natural Gas and Electricity)			9,762	10%	16,104	16%	16,104	16%	13,339	13%	16,104	16%
Waste			681	10%	988	14%	768	11%	953	13%	1,139	16%
Water/Wastewater			61	6%	61	6%	61	6%	61	6%	61	6%
Other - Offroad Equipment			-2,291	-8%	-1,915	-6%	-2,230	-8%	-2,037	-7%	-1,852	-6%
Total Community Emissions			-76,998	-13%	-106,550	-18%	-115,301	-19%	-111,934	-19%	-109,913	-18%

Notes:

Emissions forecasts for the non-transportation sectors are based on changes in housing units (residential energy), population (area sources,) employment (nonresidential energy, area sources), or service population (waste, water/wastewater).

Transportation. EMFAC2014 (exhaust) and Hexagon using the VTA regional model.

Energy. Energy use based on a four year (2011-2014) average provided by Palo Alto Utilities.

Water/Wastewater. Includes fugitive emissions from wastewater processing associated with water/wastewater treatment and conveyance. Water use and wastewater demand is estimated based on data from the Palo Alto Utilities and forecasts from the Palo Alto Utility's 2010 Urban Water Management Plan.

Waste. CARB Landfill Emissions Tool Version 1_2013 and CalRecycle. Forecast waste generation based on three year average (2010-2012) waste commitment for the City of Palo Alto obtained from CalRecycle. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.1.

Other Sources. OFFROAD2007. Estimated based on population (Landscaping), employment (Light Commercial Equipment), and construction building permits (Construction) for Palo Alto as a percentage of Santa Clara County. Excludes BAAQMD permitted sources. Daily construction emissions multiplied by 347 days/year to account for reduced/limited construction activity on weekends and holidays.

Lifecycle: The GHG emissions inventory for CEQA is not a consumption-based emissions inventory. While the BAAQMD is updating the regional emissions inventory for the Bay Area utilizing a consumption-based emissions methodology, life cycle emissions are not included in the GHG emissions analysis for CEQA purposes in accordance with the Governor's Office of Planning and Research (SB 97 Final Statement of Reasons) and the California Air Pollution Control Officer's Association (GHG Thresholds Whitepaper).

GHG emissions are based on the global warming potentials (GWPs) contained within the Intergovernmental Panel on Climate Change's (IPCC) Second Assessment Report. The IPCC has since come out with updated GWPs in their Fourth (2007) and Fifth (2013) Assessment Reports. However, BAAQMD's per capita significance criteria is based on the older GWPs in the SAR. Consequently, to maintain consistency with the modeling and thresholds currently used for CEQA assessments, this inventory utilizes the GWPs in IPCC's Second Assessment Report.

Permitted sources are based on data from BAAQMD for year 2011 emissions. City permitted sources exclude the landfill and the wastewater treatment plant to avoid double-counting. Only emissions associated with land uses in the City are included in the community emissions inventory.

PALO ALTO- CRITERIA AIR POLLUTANT INVENTORY

	2014 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	392	1,621	378	162
Energy - Residential (Natural Gas)	37	315	25	25
Energy - Nonresidential (Natural Gas)	57	517	39	39
Area Sources (Consumer Products)	1,216	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	324	332	38	37
Other (Construction Equipment)	169	1,112	68	68
Total	2,195	3,897	549	331
	2014 - tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	68	281	66	28
Energy - Residential (Natural Gas)	7	58	5	5
Energy - Nonresidential (Natural Gas)	10	94	7	7
Area Sources (Consumer Products)	222	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	59	61	7	7
Other (Construction Equipment)	29	193	12	12
Total	395	687	96	58

	2030 Existing Land Uses - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	125	329	365	149
Energy - Residential (Natural Gas)	37	315	25	25
Energy - Nonresidential (Natural Gas)	57	517	39	39
Area Sources (Consumer Products)	1,216	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	324	332	38	37
Other (Construction Equipment)	169	1,112	68	68
Total	1,927	2,606	536	319
	2030 - tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	22	57	63	26
Energy - Residential (Natural Gas)	7	58	5	5
Energy - Nonresidential (Natural Gas)	10	94	7	7
Area Sources (Consumer Products)	222	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	59	61	7	7
Other (Construction Equipment)	29	193	12	12
Total	349	463	94	56

PALO ALTO- CRITERIA AIR POLLUTANT INVENTORY

	Scenario 1 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	139	372	407	167
Energy - Residential (Natural Gas)	41	352	28	28
Energy - Nonresidential (Natural Gas)	66	598	45	45
Area Sources (Consumer Products)	1,422	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	367	382	43	43
Other (Construction Equipment)	169	1,112	68	68
Total	2,205	2,817	593	351
Change from 2014 Land Uses	277	212	57	32
	Scenario 1- tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	24	65	71	29
Energy - Residential (Natural Gas)	8	64	5	5
Energy - Nonresidential (Natural Gas)	12	109	8	8
Area Sources (Consumer Products)	260	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	67	70	8	8
Other (Construction Equipment)	29	193	12	12
Total	400	501	104	62
Change from 2014 Land Uses	50	38	10	6
	Scenario 2 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	135	361	394	161
Energy - Residential (Natural Gas)	41	352	28	28
Energy - Nonresidential (Natural Gas)	63	570	43	43
Area Sources (Consumer Products)	1,422	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	359	366	41	41
Other (Construction Equipment)	169	1,112	68	68
Total	2,189	2,761	576	342
Change from 2014 Land Uses	262	155	40	23
	Scenario 2 - tons/year			
SECTORS	23	NO_x	PM₁₀	PM_{2.5}
Transportation	23	63	68	28
Energy - Residential (Natural Gas)	8	64	5	5
Energy - Nonresidential (Natural Gas)	11	104	8	8
Area Sources (Consumer Products)	260	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	66	67	8	7
Other (Construction Equipment)	29	193	12	12
Total	397	491	101	60
Change from 2014 Land Uses	48	28	7	4

PALO ALTO- CRITERIA AIR POLLUTANT INVENTORY

	Scenario 3 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	137	366	401	164
Energy - Residential (Natural Gas)	42	360	29	29
Energy - Nonresidential (Natural Gas)	63	570	43	43
Area Sources (Consumer Products)	1,466	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	368	376	43	42
Other (Construction Equipment)	169	1,112	68	68
Total	2,244	2,784	584	346
Change from 2014 Land Uses	317	178	48	27

	Scenario 3 - tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	24	64	70	28
Energy - Residential (Natural Gas)	8	66	5	5
Energy - Nonresidential (Natural Gas)	11	104	8	8
Area Sources (Consumer Products)	268	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	67	69	8	8
Other (Construction Equipment)	29	193	12	12
Total	407	495	102	61
Change from 2014 Land Uses	58	32	8	5

	Scenario 4 - lbs/day			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	136	362	396	162
Energy - Residential (Natural Gas)	43	368	30	30
Energy - Nonresidential (Natural Gas)	66	598	45	45
Area Sources (Consumer Products)	1,512	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	376	384	44	43
Other (Construction Equipment)	169	1,112	68	68
Total	2,302	2,826	583	348
Change from 2014 Land Uses	374	220	48	29

	Scenario 4 - tons/year			
SECTORS	ROG	NO_x	PM₁₀	PM_{2.5}
Transportation	24	63	69	28
Energy - Residential (Natural Gas)	8	67	5	5
Energy - Nonresidential (Natural Gas)	12	109	8	8
Area Sources (Consumer Products)	276	-	-	-
Area Sources (Landscaping, Light Commercial Equipment)	69	70	8	8
Other (Construction Equipment)	29	193	12	12
Total	417	502	102	61
Change from 2014 Land Uses	68	40	8	5

Notes:

Transportation. EMFAC2014 (exhaust+ tire and break wear) and Hexagon using the VTA regional model.

Energy. Energy use based on a four year (2011-2014) average provided by Palo Alto Utilities.

Area Sources. OFFROAD2007. Estimated based on population (Landscaping) and employment (Light Commercial Equipment) for Palo Alto as a percentage of Santa Clara County. Excludes BAAQMD permitted sources. Does not include emissions from wood-burning fireplaces.

Other Sources. OFFROAD2007. Estimated based on construction building permits (Construction) for Palo Alto as a percentage of Santa Clara County. Daily construction emissions multiplied by 347 days/year to account for reduced/limited construction activity on weekends and holidays.

Non-Transportation Model Inputs for the Palo Alto Comprehensive Plan

[Buildout Stats](#)[forecast](#)

	City + SOI							Estimate
	CEQA Baseline			Scenario 1 (Existing CP - 2030 BAU)	Scenario 2	Scenario 3	Scenario 4 (ABAG Housing)	AB 32 Target Year
	City	SOI	2014	2030	2030	2030	2030	2020 (ABAG)
Housing Units	28,545	4,525	33,070	36,950	36,950	37,780	38,650	36,291
Population	65,685	15,120	80,805	90,210	90,210	92,045	94,065	88,600
Employment	95,460	5,370	100,830	116,700	111,070	113,975	116,700	110,450
Service Population	161,145	20,490	181,635	206,910	201,280	206,020	210,765	199,050
Jobs-Housing	3.3	1.2	3.0	3.2	3.0	3.0	3.0	

Growth Rates from Baseline

Housing Growth Rate
Population Growth Rate
Employment Growth Rate
Service Population Growth Rate

SOI + City	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
1.16	1.12	1.12	1.14	1.17	1.10
1.23	1.12	1.12	1.14	1.16	1.10
1.06	1.16	1.10	1.13	1.16	1.10
1.13	1.14	1.11	1.13	1.16	1.10

Electricity Use

Residential Electricity (Kwh)¹
Commercial + Industrial + City + Other Electricity (Kwh)²
Total Electricity (Kwh)

		BAU Forecasts					
City	SOI	SOI + City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
156,444,763	24,799,879	181,244,642	202,509,510	202,509,510	207,058,439	211,826,592	198,895,273
791,308,655	44,514,220	835,822,875	967,376,074	920,706,602	944,787,386	967,376,074	915,567,158
947,753,417	69,314,099	1,017,067,516	1,169,885,584	1,123,216,113	1,151,845,825	1,179,202,666	1,114,462,431

Source

1 Provided by Palo Alto (2014). Projected based on increase in housing units. Based on a four-year average of 2011 to 2014 data.

2 Provided by Palo Alto (2014). Projected based on increase in employment. Based on a four-year average of 2011 to 2014 data.

Natural Gas Use

Residential Natural Gas (Therms)¹
Commercial + Industrial + City + Other Natural Gas (Therms)²
Total Natural Gas (Therms)

		BAU Forecasts					
City	SOI	SOI + City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
10,772,937	1,707,744	12,480,681	13,945,000	13,945,000	14,258,243	14,586,583	13,696,120
18,223,591	1,025,149	19,248,740	22,278,369	21,203,586	21,758,159	22,278,369	21,085,226
28,996,528	2,732,892	31,729,420	36,223,369	35,148,585	36,016,402	36,864,952	34,781,346

Source

1 Provided by Palo Alto (2014). Projected based on increase in housing units. Based on a four-year average of 2011 to 2014 data.

2 Provided by Palo Alto (2014). Projected based on increase in employment. Based on a four-year average of 2011 to 2014 data.

Non-Transportation Model Inputs for the Palo Alto Comprehensive Plan

[Buildout Stats](#)

forecast

	City + SOI							Estimate
	CEQA Baseline			Scenario 1 (Existing CP - 2030 BAU)	Scenario 2	Scenario 3	Scenario 4 (ABAG Housing)	AB 32 Target Year
	City	SOI	2014	2030	2030	2030	2030	2020 (ABAG)
Housing Units	28,545	4,525	33,070	36,950	36,950	37,780	38,650	36,291
Population	65,685	15,120	80,805	90,210	90,210	92,045	94,065	88,600
Employment	95,460	5,370	100,830	116,700	111,070	113,975	116,700	110,450
Service Population	161,145	20,490	181,635	206,910	201,280	206,020	210,765	199,050
Jobs-Housing	3.3	1.2	3.0	3.2	3.0	3.0	3.0	

Growth Rates from Baseline

Housing Growth Rate
Population Growth Rate
Employment Growth Rate
Service Population Growth Rate

SOI + City	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
1.16	1.12	1.12	1.14	1.17	1.10
1.23	1.12	1.12	1.14	1.16	1.10
1.06	1.16	1.10	1.13	1.16	1.10
1.13	1.14	1.11	1.13	1.16	1.10

BAU Forecasts

Water Conveyance

Water (AF/year)
Water (gallons/year)

SOI + City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
12,983	13,767	13,766	13,767	13,768	13,765
4,230,635,205	4,485,942,577	4,485,531,107	4,485,877,531	4,486,224,321	4,485,368,127

Source

Total water generation for Palo Alto is provided by the City Utilities. Forecasts are adjusted for increases in population and employment and are based on the Target per capita SBx7-7 in the 1 2010 Urban Water Management Plan based on residential and non-residential growth.

Wastewater Treatment

Wastewater (gallons/year)
Wastewater (gallons/day)

BAU Forecasts

SOI + City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
3,815,750,000	4,046,020,174	4,045,649,055	4,045,961,507	4,046,274,287	4,045,502,058
10,454,110	11,084,987	11,083,970	11,084,826	11,085,683	11,083,567

Source

1 Indoor water use is 100 percent wastewater.

Solid Waste Generation

Waste Generation (tons/year)
Waste Generation ADC (tons/year)
Total Waste Disposal (tons/year)

BAU Forecasts

City	SOI	SOI + City 2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4	2020 (ABAG)
45,482	5,783	51,265	58,399	56,810	58,148	59,487	56,180
2,593	330	2,923	3,330	3,239	3,315	3,392	3,203
48,075	6,113	54,188	61,728	60,049	61,463	62,878	59,383

Source

CalRecycle. Disposal Reporting System (DRS): Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. Accessed May 19, 2015 .
1 <http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx>. 2013 is based on an average 2011-2013 disposal rates. Projected based on Service Population.

Comparison of the Change in Service Population and VMT in the Plan Area

Category	Existing	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Population	80,805	90,210	90,210	92,045	94,065
Percent Change in Population	NA	11.6%	11.6%	13.9%	16.4%
Employment	100,830	116,700	111,070	113,975	116,700
Total Service Population (SP)	181,635	206,910	201,280	206,020	210,765
Percent Change in SP	NA	13.9%	10.8%	13.4%	16.0%
VMT/Day	3,541,480	3,940,470	3,818,350	3,879,140	3,836,620
Percent Change in VMT per day	NA	11.3%	7.8%	9.5%	8.3%
VMT/Person/Day	43.83	43.68	42.33	42.14	40.79
Percent Change in VMT/SP/Day	NA	-0.3%	-3.4%	-3.8%	-6.9%
VMT per SP per Day	19.50	19.04	18.97	18.83	18.20
Percent Change in VMT/SP/Day	NA	-2.3%	-2.7%	-3.4%	-6.6%

Notes: Average VMT per trip and total trips is provided by Hexagon. Population and employment numbers do not exactly match the numbers shown in Chapter 3, Project Description, of this Draft EIR due to rounding of households and non-residential square feet, on which population and employment estimates were based.

Stationary Sources – BAAQMD Permitted Sources

BAAQMD 2011 INVENTORY, PALO ALTO STATIONARY SOURCESSource: BAAQMD, Accessed June 2015, Reports, Data, and Documents, <http://www.baaqmd.gov/research-and-data/emission-inventory/maps-data-and-documents>

Plant #	Plant Name	Plant Address	Biogenic	Non-Biogenic	Total
20325	Administrative Office of the Courts (AOC)	270 Grant Avenue	0	1	1
18156	Affymax, Inc	4001 Miranda Avenue	0	5	5
11268	Alta Mesa Improvement Co.	695 Arastradero Road	4	56	60
20493	AOL Inc	395 Page Mill Road	0	1	1
18078	ARE - San Francisco No 18, LLC	3350 W Bayshore Road	0	1	1
10704	AT&T	345 Hamilton Avenue	0	14	14
16761	AT&T Mobility /AT&T Services	12450 Piers Court	0	7	7
20832	Board of Trustees - Leland Stanford Jr University	3160 Porter Drive	0	3	3
19285	Campus for Jewish Life	3921 Fabian Way	0	3	3
18285	Cardio DX	2500 Faber Place	0	0	0
2951	Cavallino Rampante Ltd	1880 W Bayshore Road	0	55	55
20269	CFO2 Palo Alto, LP c/o Orchard Commercial Inc	1801st & 1881 Page Mill Rd	0	5	5
425	Channing House	850 Webster Street	0	4	4
14932	City of Palo Alto	301 Alma Street	0	2	2
14942	City of Palo Alto	250 Hamilton Avenue	0	4	4
14940	City of Palo Alto	1198 E Meadow Avenue	0	1	1
14941	City of Palo Alto	3241 E Bayshore Road	0	2	2
14930	City of Palo Alto	3201 E Bayshore Road	0	3	3
14943	City of Palo Alto	1925 Embarcadero Road	0	5	5
14944	City of Palo Alto	1802 Colorado Avenue	0	5	5
14933	City of Palo Alto	2675 Hanover Street	0	0	0
13119	City of Palo Alto Equipment Management	3201 E Bayshore Road	0	173	173
18938	City of Palo Alto-San Francisquito Pump Station	2027 E Bayshore Road	0	0	1
15320	Comcast	278 Lambert Avenue	0	1	1
20782	Communication & Control Inc	1720 Montebello Rd #5, Black Mtn	0	1	1
10520	Comms. & Power Industries	607 Hansen Way, B 550	0	3	3
11116	dpiX LLC	x406 Hillview Avenue	0	132	132
19584	Electric Power Research Institute	3420 Hillview Avenue	0	2	2
20611	Equinix	529 Bryant Street	0	12	12
16649	Equity Office Properties, Palo Alto Square	3000 El Camino Real, Bldg 2 & 5	0	1	1
20272	Fabian Way Assoc.	3895 Fabian Way, FW Senior Housing	0	0	0
19334	Genencor, A Danisco Div.	925 Page Mill Road	0	2,185	2,185
18782	Gilead Palo Alto, Inc	1651 Page Mill Road	0	1	1
19516	Gilead Palo Alto, Inc	3172 Porter Drive	0	6	6
3146	Gordon Biersch Brewery Restaurant	640 Emerson Street	7	0	7
246	Hewlett-Packard Co.	1501 Page Mill Road	0	34	34
4034	Lockheed Martin Corp., Missiles & Space	3251 Hanover Street	0	3	3
19081	Lockheed Martin Space Systems Co.	3215 Porter Drive	0	1	1
16473	Macys Inc	300 Stanford Mall	0	0	0
20707	Materials CTI, LLC	1035 E Meadow Circle	0	1	1
16315	Mathews Carlsen Body Works	2480 Faber Place	0	2	2
21287	Merck Sharp & Dohme Corp	901 So California Ave	0	2	2
13501	Pacific Bell	3350 Birch Street	0	18	18
20529	Palantir Technologies	635 Waverley Street	0	1	1
21108	Palo Alto Cafe	2675 Middlefield Rd, Ste A	0	1	1
19138	Palo Alto Medi. Foundation	795 El Camino Real	0	2	2
13710	Palo Alto Research Ctr.	3333 Coyote Hill Road	0	1	1
13958	SAP Labs LLC	3412 Hillview Avenue	0	0	0
6050	Space Systems/Loral, LLC (Bldg 25)	1025 E Meadow Circle	0	3	3
6061	Space Systems/Loral, LLC (Bldg 3)	3825 Fabian Way	0	15	15
16847	SPRINT, Environmental Health & Safety	101 Page Mill Road	0	3	3
17680	Sunrise Assisted Living Center	2701 El Camino Real	0	1	1
19945	The Westin Palo Alto	675 El Camino Real	0	2	2
20740	TIBCO Software, Inc	3303 Hillview Avenue	0	2	2
585	Varian Oncology Systems	3120 Hansen Way, D 129	0	43	43
450	Veterans Administration Medical Center	3801 Miranda Avenue	0	10,095	10,095
16345	Vi at Palo Alto	620 Sand Hill Road	0	5	5
18015	VMware	2197 E Bayshore Road	0	1	1
17920	Wilson Sonsini Goodrich & Rosati	650 Page Mill Road	0	2	2
21128	Xerox International Partners	3172 Porter Drive	0	1	1
Subtotal			11	12,932	12,943
Stanford University					
15128	Cardinal Cogen Inc	Campus & Jordan Way	0	233,977	233,977
16534	Stanford Hospital & Clinics	3375 Hillview	0	1	1
21379	Stanford School of Medicine	1651 Page Mill Road	0	1	1
20951	Stanford University School of Medicine	3165 Porter Drive	0	1	1
16873	Stanford University	3373 Hillview Avenue	0	1	1
17696	Stanford University	1050 Arastradero Road	0	3	3
639	Stanford University	ESF-480 Oak Road	0	109	109
20225	Stanford University - SOM	1501 California Ave	0	4	4
Subtotal			0	234,097	234,097
TOTAL			11	247,029	247,040
Palo Alto Municipal Inventory					
617	Palo Alto Regional Water Quality Control Plant	2501 Embarcadero Way	11,966	4,466	16,432
2721	City of Palo Alto Landfill	Byxbee Park	4,942	12,509	17,450
			16,908	16,975	33,882

Stationary sources from the City's landfill and wastewater treatment plant are calculated separately for the community inventory.

Water Use and Wastewater Generation

Water and Wastewater

[Water, Wastewater](#)

Water Demand Calculations Derived from the City of Palo Alto Utilities and the 2010 Urban Water Management Plan

Palo Alto Utilities

	City	SOI				
Population	65,685	15,120				
Annual Water (ccf)¹	2011 (CCF)	2012 (CCF)	2013 (CCF)	2014 (CCF)	Average (CCF)	Covert to Gallons
Single-Family	2,301,488	2,424,831	2,530,723	2,159,783	2,354,206	1,761,068,571
Multi-Family	73,880	77,972	78,328	69,970	75,038	56,131,948
Commercial	1,062,496	1,168,695	1,150,431	1,171,801	1,138,356	851,549,236
Industrial	332,309	274,945	263,504	238,906	277,416	207,521,579
Public Facilities	165,693	161,598	169,396	174,405	167,773	125,502,919
City Facilities	206,724	230,549	283,943	242,336	240,888	180,196,738
Commercial Multi-Family (master meter)	712,168	723,288	705,324	661,736	700,629	524,106,888
Total	4,854,758	5,061,878	5,181,649	4,718,937	4,954,306	3,706,077,880
Gallons (City)	3,631,611,179	3,786,547,698	3,876,142,628	3,530,010,015	3,706,077,880	
	2011 (gallons)	2012 (gallons)	2013 (gallons)	2014 (gallons)	Average (gallons)	
Wastewater (City + SOI)	3,821,000,000	3,621,000,000	4,052,000,000	3,769,000,000	3,815,750,000	
Wastewater (City only estimate)	3,106,025,432	2,943,448,858	3,293,801,374	3,063,755,523	3,101,757,797	

Source:

1 Eric Keniston, City of Palo Alto, April 2014 and April 2015

	Per capita	Adjusted for SP*	
Gallons Per Capita Per Day (gpcd) ¹	223.3	91.0	gallons per SP per Day
Gallons Per Capita Per Day 2020 Target (gpcd) ¹	179.30	73.1	gallons per SP per Day

Source:

1 City of Palo Alto. 2011. June. 2010 Urban Water Management Plan.

Notes:

*Service population used in UWMP based on population only. Therefore, per capita water estimates are adjusted for employment demand.

Water Use Sectors	Average 2011-2014	
	Volume (mg) ¹	Percent of Total
Single Family	1,761.1	48%
Multi-Family	580.2	16%
Commercial	851.5	23%
Industrial	207.5	6%
Public	125.5	3.4%
City Facilities	180.2	5%
Total	3,706.1	100%
AFY	11,374	

Source:

1 Eric Keniston, City of Palo Alto, April 2014 and April 2015

Gallons Per Year (City)	Scenario 1 (2030)					
	CEQA Baseline	BAU	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
Residential	1,817,200,519	1,822,417,801	1,822,417,801	1,822,551,912	1,822,699,544	1,822,287,344
Non-Residential	1,888,877,361	1,825,213,136	1,824,801,666	1,825,013,978	1,825,213,136	1,824,765,854
Total	3,706,077,880	3,647,630,936	3,647,219,466	3,647,565,890	3,647,912,680	3,647,053,197
AFY	11,374	11,194	11,193	11,194	11,195	11,192
Change from 2014 (AFY)		-179	-181	-180	-179	-181

Source:

Water use for the City of Palo Alto is estimated based on the SBX7-7 baseline and 2020 water conservation goals, measured in gallons per capita per day. Service population used in UWMP based on population only. Therefore, per capita water estimates are adjusted for employment demand.

Water and Wastewater[Water_Wastewater](#)Indoor/Outdoor Water Assumptions

	CEQA Baseline¹	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
Treated Wastewater (gallons per year)	3,101,757,797	3,052,841,322	3,052,496,947	3,052,786,883	3,053,077,124	3,052,357,790
Untreated - Outdoor (gallons per year)	604,320,084	594,789,614	594,722,519	594,779,008	594,835,556	594,695,407
Total	3,706,077,880	3,647,630,936	3,647,219,466	3,647,565,890	3,647,912,680	3,647,053,197
AFY	11,374	11,194	11,193	11,194	11,195	11,192
Untreated Water Use Percentage	16%					

Source**1** Eric Keniston, City of Palo Alto, April 2014 and April 2015

Water and Wastewater

Water Wastewater

Fugitive Emissions - Process Emissions from WWTP with Nitrification/Denitrification

CH₄ - Microorganisms can biodegrade soluble organic material in wastewater under aerobic (presence of oxygen) or anaerobic (absence of oxygen) conditions. Anaerobic conditions result in the production of CH₄.

N₂O - Treatment of domestic wastewater during both nitrification and denitrification of the nitrogen present leads to the formation of N₂O, usually in the form of urea, ammonia, and proteins. These compounds are converted to nitrate through the aerobic process of nitrification. Denitrification occurs under anoxic conditions (without free oxygen), and involves the biological conversion of nitrate into dinitrogen. N₂O can be an intermediate product of both processes, but more often is associated with denitrification.

Fugitive Emissions - Process Emissions from WWTP with Nitrification/Denitrification for combustion of biogas.

Anaerobic digesters produce methane-rich biogas which is typically combusted on-site. In some cases the biogas is combusted simply for the purpose of converting methane to CO₂, which has a lower global warming potential than methane. In many cases, a cogeneration system is used to harvest the heat from combustion and use it to generate electricity for on-site energy needs. In both cases, inherent inefficiencies in the system result in incomplete combustion of the biogas, which results in remaining methane emissions. Excludes biogenic emissions from combustion of biogas.

LGOP Version 1.1. Equation 10.1.

$$\text{CH}_4 = \text{Wastewater} \times \text{Digester Gas} \times \text{FCH}_4 \times \text{P}_{\text{CH}_4} \times (1 - \text{DE}) \times 0.0283 \times 10^{-3} \times 10^{-3}$$

	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
wastewater (gallons)=	3,101,757,797	3,052,841,322	3,052,496,947	3,052,786,883	3,053,077,124	3,052,357,790
Digester gas	0.01	ft ³ biogas/gallon wastewater				
FCH ₄	0.65	fraction of CH ₄ in biogas				
P _{CH₄}	662.00	g/m ³ , density of CH ₄ at standard conditions				
DE	0.99	CH ₄ destruction efficiency				
0.0283	= 0.0283	m ³ /ft ³ , conversion factor				
10 ⁻³	= 1.00E-03	MT/kg conversion factor				
10 ⁻³	= 1.00E-03	kg/g conversion factor				

	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
	MTons					
CH ₄ =	3.78	3.72	3.72	3.72	3.72	3.72
CO ₂ e =	79	78	78	78	78	78

Source: California Air Resources Board (CARB). 2010, May. Local Government Operations Protocol (LGOP), Version 1.1. The LGOP protocol provides default values for all the terms except the digester gas, which is assumed to be 0.1 cubic feet of biogas per gallon of wastewater effluent based on USEPA methodology outlined in the CalEEMod program manual. South Coast Air Quality Management District (SCAQMD). 2013. California Emissions Estimator Model (CalEEMod), Version 2013.2.2. User's Manual. USEPA. 2008. Page 8-12. USEPA cites Metcalf & Eddy, Inc., 1991, "Wastewater Engineering: Treatment Disposal, and Reuse," 3rd Ed. McGraw Hill Publishing.

Fugitive Emissions - Process Emissions from WWTP with Nitrification/Denitrification from discharge into aquatic environments

Nitrous oxide is produced when treated wastewater is discharged to aquatic environments such as rivers or estuaries. The nitrogen which remains in treated wastewater effluent is converted to nitrous oxide in a multi-step process accomplished by bacteria which is present in soil and aquatic environments.

LGOP Version 1.1. Equation 10.9.

$$\text{N}_2\text{O} = \text{Wastewater} \times 10^{-6} \times \text{Nload} \times 44/28 \times \text{EF effluent} \times 10^{-3}$$

	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
wastewater (Liters)=	11,740,153,260	11,555,004,404	11,553,700,945	11,554,798,351	11,555,896,914	11,553,174,237
10 ⁻⁶	= 1.00E-06	conversion factor; kg/mg				
N Load	26.00	mg/L of wastewater USEPA 2013				
48/28	1.57	Ratio of molecular weights for N ₂ O and N ₂				
EF effluent	0.01	kg/N ₂ O/kg N				
10 ⁻³	= 1.00E-03	conversion factor: MTons/kg				

	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
	MTons					
N ₂ O	2.40	2.36	2.36	2.36	2.36	2.36
CO ₂ e =	743	732	732	732	732	732

Source: California Air Resources Board (CARB). 2010, May. Local Government Operations Protocol (LGOP), Version 1.1. The LGOP protocol provides default values for all the terms except the Nitrogen Load, which is assumed to be 26 mg of N per Liter of wastewater effluent based on USEPA methodology outlined in the CalEEMod program manual. South Coast Air Quality Management District (SCAQMD). 2013. California Emissions Estimator Model (CalEEMod), Version 2013.2.2. User's Manual. USEPA. 2008. Page 8-12. USEPA cites Metcalf & Eddy, Inc., 1991, "Wastewater Engineering: Treatment Disposal, and Reuse," 3rd Ed. McGraw Hill Publishing.

Water and Wastewater

[Water_Wastewater](#)

Energy for Water Conveyance, Treatment, Distribution, and Wastewater Treatment (Northern California)

Water Supply and Conveyance (Northern California)	Water Treatment kWhr/million gallons	Water Distribution	Total Water	Wastewater Treatment	
2,117	111	1,272	3,500	1,687	
2,117	0	0	2,117	0	Without double-counting
Source 1: California Energy Commission (CEC). 2006, December. Refining Estimates of Water-Related Energy Use in California. CEC-500-2006-118. Prepared by Navigant Consulting, Inc. Based on the electricity use for Northern California.					
Source 2: Eric Keniston, City of Palo Alto, April 2014 and April 2015. Average 2011 to 2014 kWh/MG energy required to treat wastewater.					

Palo Alto Utilities

	Intensity factor	CO ₂ e
	CO ₂ MTons/MWh ¹	MTons/MWh
2014	0.000	0.000
Source 1: Eric Keniston, City of Palo Alto, April 2014.		

ABAU Carbon Intensity for Palo Alto Utilities' Energy

	2014	2020	
Assumed Percent Renewable	33%	202100%	
CO ₂ e MTons/Mwh without Renewable	0.000		
Source 1: Eric Keniston, City of Palo Alto, April 2014.			

GHG Emissions from Energy Associated with Water/Wastewater

	CEQA Baseline Mwh/Year	Scenario 1 2030	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year 2020
Energy Associated with Water Use						
Water	7,846	7,722	7,721	7,722	7,723	7,721
Wastewater	0	0	0	0	0	0
Total Water/Wastewater	7,846	7,722	7,721	7,722	7,723	7,721

	CEQA Baseline MTCO ₂ e/Year	Scenario 1 2030	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year 2020
GHG Emissions from Energy Associated with Water Use/Wastewater Generation						
Water	0	0	0	0	0	0
Wastewater	0	0	0	0	0	0
Total Water/Wastewater	0	0	0	0	0	0

Total GHGs

	CEQA Baseline MTCO ₂ e/Year	Scenario 1 2030	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year 2020
GHG Emissions from Water/Wastewater Use						
Water	0	0	0	0	0	0
Wastewater	823	810	810	810	810	810
Total Water/Wastewater	823	810	810	810	810	810

Water and Wastewater

[Water, Wastewater](#)

Water Demand Calculations Derived from the City of Palo Alto Utilities and the 2010 Urban Water Management Plan

Palo Alto Utilities

	City					
Population	65,685					
Annual Water (ccf)¹	2011 (CCF)	2012 (CCF)	2013 (CCF)	2014 (CCF)	Average (CCF)	Covert to Gallons
Single-Family	2,301,488	2,424,831	2,530,723	2,159,783	2,354,206	1,761,068,571
Multi-Family	73,880	77,972	78,328	69,970	75,038	56,131,948
Commercial	1,062,496	1,168,695	1,150,431	1,171,801	1,138,356	851,549,236
Industrial	332,309	274,945	263,504	238,906	277,416	207,521,579
Public Facilities	165,693	161,598	169,396	174,405	167,773	125,502,919
City Facilities	206,724	230,549	283,943	242,336	240,888	180,196,738
Commercial Multi-Family (master meter)	712,168	723,288	705,324	661,736	700,629	524,106,888
Total	4,854,758	5,061,878	5,181,649	4,718,937	4,954,306	3,706,077,880
Gallons (City)	3,631,611,179	3,786,547,698	3,876,142,628	3,530,010,015	3,706,077,880	
	2011 (gallons)	2012 (gallons)	2013 (gallons)	2014 (gallons)	Average (gallons)	
Wastewater (City + SOI)	3,821,000,000	3,621,000,000	4,052,000,000	3,769,000,000	3,815,750,000	

Source:

- 1 Eric Keniston, City of Palo Alto, April 2014 and April 2015

	Per capita	Adjusted for SP*	
Gallons Per Capita Per Day (gpcd) ¹	223.3	91.0	gallons per SP per Day
Gallons Per Capita Per Day 2020 Target (gpcd) ¹	179.30	73.1	gallons per SP per Day

Source:

- 1 City of Palo Alto. 2011, June. 2010 Urban Water Management Plan.

Notes:

*Service population used in UWMP based on population only. Therefore, per capita water estimates are adjusted for employment demand.

	Average 2011-2014	
Water Use Sectors	Volume (mg) ¹	Percent of Total
Single Family	1,761.1	48%
Multi-Family	580.2	16%
Commercial	851.5	23%
Industrial	207.5	6%
Public	125.5	3.4%
City Facilities	180.2	5%
Total	3,706.1	100%
AFY	11,374	

Source:

- 1 Eric Keniston, City of Palo Alto, April 2014 and April 2015

	Scenario 1 (2030)					
Gallons Per Year (City + SOI)	CEQA Baseline	BAU	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
Residential	2,235,501,073	2,242,013,287	2,242,013,287	2,242,147,398	2,242,295,031	2,241,895,620
Non-Residential	1,995,134,133	2,243,929,290	2,243,517,820	2,243,730,133	2,243,929,290	2,243,472,507
Total	4,230,635,205	4,485,942,577	4,485,531,107	4,485,877,531	4,486,224,321	4,485,368,127
AFY	12,983	13,767	13,766	13,767	13,768	13,765
Change from 2014 (AFY)		784	782	783	784	782

Source:

Water use for the City of Palo Alto is estimated based on the SBX7-7 baseline and 2020 water conservation goals, measured in gallons per capita per day. Service population used in UWMP based on population only. Therefore, per capita water estimates are adjusted for employment demand.

Water and Wastewater[Water Wastewater](#)Indoor/Outdoor Water Assumptions

	CEQA Baseline¹	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
Treated Wastewater (gallons per year)	3,815,750,000	4,046,020,174	4,045,649,055	4,045,961,507	4,046,274,287	4,045,502,058
Untreated - Outdoor (gallons per year)	414,885,205	439,922,403	439,882,052	439,916,025	439,950,033	439,866,069
Total	4,230,635,205	4,485,942,577	4,485,531,107	4,485,877,531	4,486,224,321	4,485,368,127
AFY	12,983	13,767	13,766	13,767	13,768	13,765
Untreated Water Use Percentage	10%					

Source

1 Eric Keniston, City of Palo Alto, April 2014 and April 2015

Water and Wastewater

Water Wastewater

Fugitive Emissions - Process Emissions from WWTP with Nitrification/Denitrification

CH₄ - Microorganisms can biodegrade soluble organic material in wastewater under aerobic (presence of oxygen) or anaerobic (absence of oxygen) conditions. Anaerobic conditions result in the production of CH₄.

N₂O - Treatment of domestic wastewater during both nitrification and denitrification of the nitrogen present leads to the formation of N₂O, usually in the form of urea, ammonia, and proteins. These compounds are converted to nitrate through the aerobic process of nitrification. Denitrification occurs under anoxic conditions (without free oxygen), and involves the biological conversion of nitrate into dinitrogen. N₂O can be an intermediate product of both processes, but more often is associated with denitrification.

Fugitive Emissions - Process Emissions from WWTP with Nitrification/Denitrification for combustion of biogas.

Anaerobic digesters produce methane-rich biogas which is typically combusted on-site. In some cases the biogas is combusted simply for the purpose of converting methane to CO₂, which has a lower global warming potential than methane. In many cases, a cogeneration system is used to harvest the heat from combustion and use it to generate electricity for on-site energy needs. In both cases, inherent inefficiencies in the system result in incomplete combustion of the biogas, which results in remaining methane emissions. Excludes biogenic emissions from combustion of biogas.

LGOP Version 1.1. Equation 10.1.

$$\text{CH}_4 = \text{Wastewater} \times \text{Digester Gas} \times \text{FCH}_4 \times \text{P}_{\text{CH}_4} \times (1 - \text{DE}) \times 0.0283 \times 10^{-3} \times 10^{-3}$$

wastewater (gallons)=	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
Digester gas	0.01	0.01	0.01	0.01	0.01	0.01
FCH ₄	0.65	0.65	0.65	0.65	0.65	0.65
P _{CH₄}	662.00	662.00	662.00	662.00	662.00	662.00
DE	0.99	0.99	0.99	0.99	0.99	0.99
0.0283	0.0283	0.0283	0.0283	0.0283	0.0283	0.0283
10 ⁻³	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03
10 ⁻³	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03

	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
CH₄	MTons					
CH ₄	4.65	4.93	4.93	4.93	4.93	4.93
CO ₂ e	98	103	103	103	103	103

Source: California Air Resources Board (CARB). 2010, May. Local Government Operations Protocol (LGOP), Version 1.1. The LGOP protocol provides default values for all the terms except the digester gas, which is assumed to be 0.1 cubic feet of biogas per gallon of wastewater effluent based on USEPA methodology outlined in the CalEEMod program manual. South Coast Air Quality Management District (SCAQMD). 2013. California Emissions Estimator Model (CalEEMod), Version 2013.2.2. User's Manual. USEPA. 2008. Page 8-12. USEPA cites Metcalf & Eddy, Inc., 1991, "Wastewater Engineering: Treatment Disposal, and Reuse," 3rd Ed. McGraw Hill Publishing.

Fugitive Emissions - Process Emissions from WWTP with Nitrification/Denitrification from discharge into aquatic environments

Nitrous oxide is produced when treated wastewater is discharged to aquatic environments such as rivers or estuaries. The nitrogen which remains in treated wastewater effluent is converted to nitrous oxide in a multi-step process accomplished by bacteria which is present in soil and aquatic environments.

LGOP Version 1.1. Equation 10.9.

$$\text{N}_2\text{O} = \text{Wastewater} \times 10^{-6} \times \text{Nload} \times 44/28 \times \text{EF effluent} \times 10^{-3}$$

wastewater (Liters)=	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
10 ⁻⁶	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
N Load	26.00	26.00	26.00	26.00	26.00	26.00
48/28	1.57	1.57	1.57	1.57	1.57	1.57
EF effluent	0.01	0.01	0.01	0.01	0.01	0.01
10 ⁻³	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03	1.00E-03

	CEQA Baseline	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year
N₂O	MTons					
N ₂ O	2.95	3.13	3.13	3.13	3.13	3.13
CO ₂ e	915	970	970	970	970	970

Source: California Air Resources Board (CARB). 2010, May. Local Government Operations Protocol (LGOP), Version 1.1. The LGOP protocol provides default values for all the terms except the Nitrogen Load, which is assumed to be 26 mg of N per Liter of wastewater effluent based on USEPA methodology outlined in the CalEEMod program manual. South Coast Air Quality Management District (SCAQMD). 2013. California Emissions Estimator Model (CalEEMod), Version 2013.2.2. User's Manual. USEPA. 2008. Page 8-12. USEPA cites Metcalf & Eddy, Inc., 1991, "Wastewater Engineering: Treatment Disposal, and Reuse," 3rd Ed. McGraw Hill Publishing.

Water and Wastewater

[Water_Wastewater](#)

Energy for Water Conveyance, Treatment, Distribution, and Wastewater Treatment (Northern California)

Water Supply and Conveyance (Northern California)	Water Treatment kWhr/million gallons	Water Distribution	Total Water	Wastewater Treatment	
2,117	111	1,272	3,500	1,687	
2,117	0	0	2,117	0	Without double-counting
Source 1: California Energy Commission (CEC). 2006, December. Refining Estimates of Water-Related Energy Use in California. CEC-500-2006-118. Prepared by Navigant Consulting, Inc. Based on the electricity use for Northern California.					
Source 2: Eric Keniston, City of Palo Alto, April 2014 and April 2015. Average 2011 to 2014 kWh/MG energy required to treat wastewater.					

Palo Alto Utilities

	Intensity factor	CO ₂ e
	CO ₂ MTons/MWH ¹	MTons/MWh
2014	0.000	0.000
Source 1: Eric Keniston, City of Palo Alto, April 2014.		

GHG Emissions from Energy Associated with Water/Wastewater

	CEQA Baseline MwH/Year	Scenario 1 2030	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year 2020
Energy Associated with Water Use						
Water	8,956	9,497	9,496	9,497	9,497	9,496
Wastewater	0	0	0	0	0	0
Total Water/Wastewater	8,956	9,497	9,496	9,497	9,497	9,496

	CEQA Baseline MTCO ₂ e/Year	Scenario 1 2030	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year 2020
GHG Emissions from Energy Associated with Water Use/Wastewater Generation						
Water	0	0	0	0	0	0
Wastewater	0	0	0	0	0	0
Total Water/Wastewater	0	0	0	0	0	0

Total GHGs

	CEQA Baseline MTCO ₂ e/Year	Scenario 1 2030	Scenario 2	Scenario 3	Scenario 4	AB 32 Target Year 2020
GHG Emissions from Water/Wastewater Use						
Water	0	0	0	0	0	0
Wastewater	1,012	1,073	1,073	1,073	1,073	1,073
Total Water/Wastewater	1,012	1,073	1,073	1,073	1,073	1,073

Solid Waste Disposal

Solid Waste Disposal

Source: CalRecycle Disposal By Facility - City of Palo Alto (Disposal Reporting System)

Waste Generated Within City Limits

Waste in Place Method					
Years	historic population estimates	Year	Interstate Tons + Transform Tons	ADC+AIC	
4	64,166	2011	43,947	2,786	46,733
3	64,673	2012	45,411	1,961	47,373
2	65,179	2013	47,088	3,031	50,119
1	65,685	2014 (Average 2013-2011)	45,482	2,593	48,075
		Disposal Rate / SP	0.282	0.016	0.298

Average 3-year disposal used to forecast waste disposal in 2030

Source: CalRecycle, 2014, Disposal Reporting System, Jurisdiction Reporting by Facility, Palo Alto. <http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx>

Landfill Emission Tool (version 1.3) Model Results forecasted for ~30-50 years of decomposition								
Year	MT CH ₄ in CO ₂ e	MTCO ₂ e w/ 75% LFG Capture			MTCO ₂ e w/LFG Capture	MTCO ₂ e w/LFG Capture		
	2014 Disposal	2014 Disposal	City + SOI	Scenario 1 (Existing CP - 2030 BAU)	Scenario 2	Scenario 3	Scenario 4 (ABAG Housing)	AB 32 Target Year
1	770	192	192	219	212	218	223	209
2	1,501	375	375	427	414	425	436	408
3	1,445	361	361	411	398	409	420	393
4	1,392	348	348	396	383	394	404	378
5	1,340	335	335	381	369	379	389	364
6	1,290	322	322	367	355	365	374	351
7	1,242	310	310	353	342	351	360	338
8	1,195	299	299	340	329	338	347	325
9	1,151	288	288	327	317	326	334	313
10	1,108	277	277	315	305	313	322	301
11	1,067	267	267	303	294	302	310	290
12	1,027	257	257	292	283	290	298	279
13	988	247	247	281	272	280	287	269
14	926	232	232	263	255	262	269	252
15	880	220	220	250	242	249	255	239
16	833	208	208	237	230	236	242	227
17	787	197	197	224	217	223	228	214
18	740	185	185	210	204	209	215	201
19	694	173	173	197	191	196	201	189
20	647	162	162	184	178	183	188	176
21	601	150	150	171	165	170	174	163
22	554	139	139	157	153	157	161	151
23	508	127	127	144	140	144	147	138
24	461	115	115	131	127	130	134	125
25	414	104	104	118	114	117	120	113
26	368	92	92	105	101	104	107	100
27	321	80	80	91	89	91	93	87
28	275	69	69	78	76	78	80	75
29	228	57	57	65	63	65	66	62
30	182	45	45	52	50	51	53	49
31	135	34	34	38	37	38	39	37
32	89	22	22	25	24	25	26	24
33	42	11	11	12	12	12	12	11
TOTAL	25,200	6,300	6,300	7,163	6,943	7,128	7,314	6,854

Waste. Landfill Emissions Tool Version 1.3 and CalRecycle. Biogenic CO₂ emissions are not included.

Notes

LFG capture

Efficiency 0.75

Waste generation based on three year average (2011-2013) waste commitment for the City of Palo Alto obtained from CalRecycle. This sector captures only the waste that is generated by the City of Palo Alto residents and businesses in the inventory year. This sector does not include historically generated waste disposal.

This method assumes that the degradable organic component (degradable organic carbon, DOC) in waste decays slowly throughout a few decades, during which CH₄ and biogenic CO₂ are formed. If conditions are constant, the rate of CH₄ production depends solely on the amount of carbon remaining in the waste. As a result emissions of CH₄ from waste deposited in a disposal site are highest in the first few years after deposition, then gradually decline as the degradable carbon in the waste is consumed by the bacteria responsible for the decay. Significant CH₄ production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer.

Decomposition based on an average annual rainfall of 21.68 inches per year average in Morgan Hill near the Kirby Canyon Landfill (anaerobic decomposition factor (k) of 0.038) (WRCC 2014).

The Landfill Gas Estimator only includes the landfill gas (LFG) capture in the landfill gas heat output and therefore the reduction and emissions from landfill gas capture are calculated separately. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.1.

Solid Waste Disposal

Source: CalRecycle Disposal By Facility - City of Palo Alto (Disposal Reporting System)

Waste Generated Within City Limits

Waste in Place Method					
Years	historic population estimates	Interstate Tons +			
		Year	Transform Tons	ADC+AIC	
4	64,166	2011	43,947	2,786	46,733
3	64,673	2012	45,411	1,961	47,373
2	65,179	2013	47,088	3,031	50,119
1	65,685	2014 (Average 2013-2011)		45,482	48,075
		Disposal Rate / SP		0.282	0.298

Average 3-year disposal used to forecast waste disposal in 2030

Source: CalRecycle, 2014, Disposal Reporting System, Jurisdiction Reporting by Facility, Palo Alto. <http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx>

Landfill Emission Tool (version 1.3) Model Results forecasted for ~30-50 years of decomposition								
Year	MT CH ₄ in CO ₂ e	MTCO ₂ e w/ 75% LFG Capture			MTCO ₂ e w/LFG Capture	MTCO ₂ e w/LFG Capture		
	2014 Disposal	2014 Disposal	City + SOI	Scenario 1 (Existing CP - 2030 BAU)	Scenario 2	Scenario 3	Scenario 4 (ABAG Housing)	AB 32 Target Year
1	770	192	217	247	240	246	252	238
2	1,501	375	423	482	469	480	491	464
3	1,445	361	407	464	451	462	473	446
4	1,392	348	392	447	435	445	455	430
5	1,340	335	377	430	418	428	438	414
6	1,290	322	363	414	403	412	422	398
7	1,242	310	350	399	388	397	406	383
8	1,195	299	337	384	373	382	391	369
9	1,151	288	324	369	359	368	376	355
10	1,108	277	312	356	346	354	362	342
11	1,067	267	301	342	333	341	349	329
12	1,027	257	289	330	321	328	336	317
13	988	247	279	317	309	316	323	305
14	926	232	261	297	289	296	303	286
15	880	220	248	282	275	281	288	272
16	833	208	235	267	260	266	272	257
17	787	197	222	253	246	251	257	243
18	740	185	209	238	231	237	242	229
19	694	173	195	223	217	222	227	214
20	647	162	182	208	202	207	212	200
21	601	150	169	193	188	192	196	185
22	554	139	156	178	173	177	181	171
23	508	127	143	163	158	162	166	157
24	461	115	130	148	144	147	151	142
25	414	104	117	133	129	132	136	128
26	368	92	104	118	115	118	120	114
27	321	80	91	103	100	103	105	99
28	275	69	77	88	86	88	90	85
29	228	57	64	73	71	73	75	71
30	182	45	51	58	57	58	59	56
31	135	34	38	43	42	43	44	42
32	89	22	25	28	28	28	29	27
33	42	11	12	14	13	13	14	13
TOTAL	25,200	6,300	7,101	8,089	7,869	8,054	8,240	7,782

Waste. Landfill Emissions Tool Version 1.3 and CalRecycle. Biogenic CO₂ emissions are not included.

Notes

LFG capture

Efficiency 0.75

Waste generation based on three year average (2011-2013) waste commitment for the City of Palo Alto obtained from CalRecycle. This sector captures only the waste that is generated by the City of Palo Alto residents and businesses in the inventory year. This sector does not include historically generated waste disposal.

This method assumes that the degradable organic component (degradable organic carbon, DOC) in waste decays slowly throughout a few decades, during which CH₄ and biogenic CO₂ are formed. If conditions are constant, the rate of CH₄ production depends solely on the amount of carbon remaining in the waste. As a result emissions of CH₄ from waste deposited in a disposal site are highest in the first few years after deposition, then gradually decline as the degradable carbon in the waste is consumed by the bacteria responsible for the decay. Significant CH₄ production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer.

Decomposition based on an average annual rainfall of 21.68 inches per year average in Morgan Hill near the Kirby Canyon Landfill (anaerobic decomposition factor (k) of 0.038) (WRCC 2014).

The Landfill Gas Estimator only includes the landfill gas (LFG) capture in the landfill gas heat output and therefore the reduction and emissions from landfill gas capture are calculated separately. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.1.

Energy Use – Purchased Electricity & Natural Gas

Energy Use Report for Palo Alto- Purchased Electricity

Provided by Eric Keniston, City of Palo Alto, April 2014 and April 2015

2011-2013 average	2011 Annual KWH	2012 Annual KWH	2013 Annual KWH	2014 Annual KWH	Kwh 4-yr Avg
Single-Family	121,844,350	118,517,756	118,439,000	113,219,501	118,005,152
Multi-Family	38,667,524	39,386,048	39,396,692	36,308,179	38,439,611
Commercial	420,155,466	435,616,568	461,915,179	479,054,844	449,185,514
Industrial	251,541,035	227,281,310	219,218,161	210,241,296	227,070,451
Public Facilities	55,923,659	54,657,391	55,182,913	56,218,434	55,495,599
City Facilities	29,331,131	29,040,538	28,809,795	29,713,565	29,223,757
Commercial Multi-Family (master meter)	32,025,863	30,420,776	30,257,401	28,629,293	30,333,333
Total	949,489,028	934,920,387	953,219,141	953,385,112	947,753,417

Energy Use Report for Palo Alto - Natural Gas

Provided by Eric Keniston, City of Palo Alto, April 2014 and April 2015

2011-2013 average	2011 Annual Therms	2012 Annual Therms	2013 Annual Therms	2014 Annual Therms	Therms 4-yr Avg
Single-Family	10,287,368	9,510,992	9,815,382	7,916,548	9,382,573
Multi-Family	1,450,423	1,431,732	1,471,949	1,207,354	1,390,365
Commercial	7,988,655	8,040,302	8,580,855	8,504,190	8,278,501
Industrial	5,079,522	4,453,603	3,995,267	3,606,115	4,283,627
Public Facilities	2,402,418	2,243,997	2,258,653	2,047,591	2,238,165
City Facilities	996,273	827,300	852,108	881,204	889,221
Commercial Multi-Family (master meter)	2,691,001	2,635,593	2,550,396	2,259,322	2,534,078
Total	30,895,660	29,143,519	29,524,610	26,422,324	28,996,528

Energy

Energy Emission Factors

Natural Gas	Intensity factor				CO ₂ e
	lbs CO ₂ /Therm	MTons CO ₂ /Therm	CH ₄ MTons/Therm	N ₂ O MTons/Therm	MTons/Therm
All Years	11.7	0.00530	5.E-07	1.E-08	0.00532
Source: CO ₂ , CH ₄ and N ₂ O intensity based on Table G.3 of the LGOP for residential and non-residential (CO ₂ : 53.02 kg/Mmbtu; CH ₄ : 0.005 kg/MMBtu; N ₂ O: 0.0001 kg/MMBtu)					

Palo Alto Utilities

Palo Alto Intensity factor			CO ₂ e	
	CO ₂ MTons/MWh ¹		MTons/MWh	CH ₄ MTons/MWh ¹
2012	0.113		0.113	0.000013
2013	0.000		0.000	0.000013
2014	0.000		0.000	0.000013
Source 1: Eric Keniston, City of Palo Alto, April 2014 and April 2015.				

ABAU Carbon Intensity for Palo Alto Utilities Energy

	2014	2020	
Assumed Percent Renewable	33.0%	56.5%	
CO ₂ e MTons/Mwh without Renewable	0.000		

Based on the Palo Alto Utilities 2014 Renewable Portfolio estimate and the Utilities' expected 2020 RPS.

Source: Eric Keniston, City of Palo Alto, April 2015.

GHG Emissions from Energy Use

Electricity	MTCO ₂ e/Year					2020 (ABAG)
	City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	
Residential Electricity	0	0	0	0	0	0
Commercial + Industrial	0	0	0	0	0	0
Total	0	0	0	0	0	0

Natural Gas	MTCO ₂ e/Year					2020 (ABAG)
	City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	
Residential Electricity	57,265	62,721	62,721	64,376	66,132	58,398
Commercial + Industrial	96,869	112,578	106,865	109,813	112,578	106,368
Total	154,134	175,299	169,586	174,189	178,710	164,766

Summary	MTCO ₂ e/Year					2020 (ABAG)
	City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	
Residential Total	57,265	62,721	62,721	64,376	66,132	58,398
Commercial + Industrial Total	96,869	112,578	106,865	109,813	112,578	106,368
Total	154,134	175,299	169,586	174,189	178,710	164,766

General Conversion Factors

lbs to kg	0.4536
kg to MTons	0.001
Mmbtu to Therm	0.1
kilowatt hrs to megawatt hrs	0.001
lbs to Tons	2000
Tons to MTon	0.9071847

Source: California Air Resources Board (CARB). 2010. Local Government Operations Protocol. Version 1.1. Appendix F, Standard Conversion Factors

Global Warming Potentials (GWP)	
CO ₂	1
CH ₄	21
N ₂ O	310

Source: Intergovernmental Panel on Climate Change (IPCC). 1995. Second Assessment Report: Climate Change 1995.

Therms to kwh	29.30711111

Criteria Air Pollutants from Natural Gas

Rate	lbs/MBTU					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Natural Gas						
Residential	0.01078431	0.09215686	0.03921569	0.00058824	0.00745098	0.00745098
Non-Residential	0.01078431	0.09803922	0.08235294	0.00058824	0.00745098	0.00745098

Source: CalEEMod Version 2013.2.2.

Natural Gas	2014 lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	32	272	116	2	22	22
Commercial + Industrial	54	489	411	3	37	37
Total	86	761	527	5	59	59

Natural Gas	Scenario 1 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	35	298	127	2	24	24
Commercial + Industrial	63	569	478	3	43	43
Total	97	867	605	5	67	67
Increase from Baseline	12	105	78	1	8	8

Natural Gas	Scenario 2 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	35	298	127	2	24	24
Commercial + Industrial	59	540	454	3	41	41
Total	94	838	580	5	65	65
Increase from Baseline	9	76	53	0	6	6

Natural Gas	Scenario 3 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	36	306	130	2	25	25
Commercial + Industrial	59	540	454	3	41	41
Total	95	846	584	5	66	66
Increase from Baseline	10	84	57	1	7	7

Natural Gas	Scenario 4 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	37	314	134	2	25	25
Commercial + Industrial	63	569	478	3	43	43
Total	99	883	612	5	69	69
Increase from Baseline	14	121	85	1	9	9

General Conversion Factors

Mmbtu to Therm	0.1
lbs to Tons	2000
Tons to MTon	0.9071847

Source: California Air Resources Board (CARB). 2010. Local Government Operations Protocol. Version 1.1. Appendix F, Standard Conversion Factors

Energy

Energy Emission Factors

Natural Gas	Intensity factor				CO ₂ e
	lbs CO ₂ /Therm	MTons CO ₂ /Therm	CH ₄ MTons/Therm	N ₂ O MTons/Therm	MTons/Therm
All Years	11.7	0.00530	5.E-07	1.E-08	0.00532
Source: CO ₂ , CH ₄ and N ₂ O intensity based on Table G.3 of the LGOP for residential and non-residential (CO ₂ : 53.02 kg/Mmbtu; CH ₄ : 0.005 kg/MMBtu; N ₂ O: 0.0001 kg/MMBtu)					

Palo Alto Utilities

Palo Alto Intensity factor			CO ₂ e	
	CO ₂ MTons/MWh ¹		MTons/MWh	CH ₄ MTons/MWh ¹
2012	0.113		0.113	0.000013
2013	0.000		0.000	0.000013
2014	0.000		0.000	0.000013
Source 1: Eric Keniston, City of Palo Alto, April 2014 and April 2015.				

ABAU Carbon Intensity for Palo Alto Utilities Energy

	2014	2020	
Assumed Percent Renewable	33.0%	56.5%	
CO ₂ e MTons/Mwh without Renewable	0.000		

Based on the Palo Alto Utilities 2014 Renewable Portfolio estimate and the Utilities' expected 2020 RPS.

Source: Eric Keniston, City of Palo Alto, April 2015.

GHG Emissions from Energy Use

Electricity	MTCO ₂ e/Year					2020 (ABAG)
	SOI + City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	
Residential Electricity	0	0	0	0	0	0
Commercial + Industrial	0	0	0	0	0	0
Total	0	0	0	0	0	0

Natural Gas	MTCO ₂ e/Year					2020 (ABAG)
	SOI + City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	
Residential Electricity	66,342	74,126	74,126	75,791	77,536	72,803
Commercial + Industrial	102,319	118,423	112,710	115,658	118,423	112,081
Total	168,661	192,549	186,836	191,449	195,959	184,884

Summary	MTCO ₂ e/Year					2020 (ABAG)
	SOI + City 2014	Scenario 1 (2030 BAU)	Scenario 2	Scenario 3	Scenario 4	
Residential Total	66,342	74,126	74,126	75,791	77,536	72,803
Commercial + Industrial Total	102,319	118,423	112,710	115,658	118,423	112,081
Total	168,661	192,549	186,836	191,449	195,959	184,884

General Conversion Factors

lbs to kg	0.4536
kg to MTons	0.001
Mmbtu to Therm	0.1
kilowatt hrs to megawatt hrs	0.001
lbs to Tons	2000
Tons to MTon	0.9071847

Source: California Air Resources Board (CARB). 2010. Local Government Operations Protocol. Version 1.1. Appendix F, Standard Conversion Factors

Global Warming Potentials (GWP)	
CO ₂	1
CH ₄	21
N ₂ O	310

Source: Intergovernmental Panel on Climate Change (IPCC). 1995. Second Assessment Report: Climate Change 1995.

Therms to kwh	29.30711111

Criteria Air Pollutants from Natural Gas

Rate	lbs/MBTU					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Natural Gas						
Residential	0.01078431	0.09215686	0.03921569	0.00058824	0.00745098	0.00745098
Non-Residential	0.01078431	0.09803922	0.08235294	0.00058824	0.00745098	0.00745098

Source: CalEEMod Version 2013.2.2.

Natural Gas	2014 lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	37	315	134	2	25	25
Commercial + Industrial	57	517	434	3	39	39
Total	94	832	568	5	65	65

Natural Gas	Scenario 1 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	41	352	150	2	28	28
Commercial + Industrial	66	598	503	4	45	45
Total	107	950	652	6	74	74
Increase from Baseline	13	118	84	1	9	9

Natural Gas	Scenario 2 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	41	352	150	2	28	28
Commercial + Industrial	63	570	478	3	43	43
Total	104	922	628	6	72	72
Increase from Baseline	10	89	60	1	7	7

Natural Gas	Scenario 3 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	42	360	153	2	29	29
Commercial + Industrial	63	570	478	3	43	43
Total	105	930	632	6	72	72
Increase from Baseline	11	97	63	1	8	8

Natural Gas	Scenario 4 Project lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	43	368	157	2	30	30
Commercial + Industrial	66	598	503	4	45	45
Total	109	967	659	6	75	75
Increase from Baseline	15	135	91	1	10	10

General Conversion Factors

Mmbtu to Therm	0.1
lbs to Tons	2000
Tons to MTon	0.9071847

Source: California Air Resources Board (CARB). 2010. Local Government Operations Protocol. Version 1.1. Appendix F, Standard Conversion Factors

On-Road Transportation

CITY OF PALO ALTO (City Only) — TRANSPORTATION SECTOR

EMFAC2014 v1.0.7

Based on SAR GWPs

Black - VMT with SB 375 RTAC method applied (I-I*100%, I-X*50%)

VMT	City of Palo Alto (City Only)						
	Population	Employment	Service Population (SP)	Daily VMT ¹	Rate (VMT/SP) ¹	Adjusted Daily VMT	Annual VMT ²
EXISTING 2014							
Internal VMT (passenger vehicles)				310,078		310,080	107,597,760
Internal-External VMT (passenger vehicles)				5,010,853		5,010,850	1,738,764,950
Internal VMT (trucks)				3,056		3,060	1,061,820
Internal-External VMT (trucks)				237,813		237,810	82,520,070
<i>Total Adjusted (City)</i>						5,561,800	1,929,944,600
VTA Model Total (not adjusted)	65,685	95,460	161,145	5,561,800	34.5	5,561,800	1,929,944,600
<i>without Trucks (adjusted)</i>				5,320,931	33.0	5,320,930	
VTA Model w/RTAC	65,685	95,460	161,145	2,937,467	18.2	2,937,470	1,019,302,090
<i>without Trucks (adjusted)</i>				2,815,505	17.5	2,815,505	
Year 2014 - Existing City	65,685	95,460	161,145	2,937,467	18.2	2,937,470	1,019,302,090
SCENARIO 1							
Internal VMT (passenger vehicles)				335,585		335,590	116,449,730
Internal-External VMT (passenger vehicles)				5,611,573		5,611,570	1,947,214,790
Internal VMT (trucks)				3,396		3,400	1,179,800
Internal-External VMT (trucks)				151,092		151,090	52,428,230
<i>Total Adjusted (City)</i>						6,101,650	2,117,272,550
VTA Model Total (not adjusted)	72,285	110,940	183,225	6,101,646	33.3	6,101,650	2,117,272,550
<i>without Trucks (adjusted)</i>				5,947,158	32.5	5,947,160	
VTA Model w/RTAC	72,285	110,940	183,225	3,220,314	17.6	3,220,310	1,117,447,570
<i>without Trucks (adjusted)</i>				3,141,372	17.1	3,141,375	
Scenario 1	72,285	110,940	183,225	3,220,314	17.6	3,220,310	1,117,447,570
SCENARIO 2							
Internal VMT (passenger vehicles)				325,298		325,300	112,879,100
Internal-External VMT (passenger vehicles)				5,416,075		5,416,080	1,879,379,760
Internal VMT (trucks)				3,045		3,050	1,058,350
Internal-External VMT (trucks)				265,813		265,810	92,236,070
<i>Total Adjusted (City)</i>						6,010,240	2,085,553,280
VTA Model Total (not adjusted)	72,285	105,310	177,595	6,010,231	33.8	6,010,230	2,085,549,810
<i>without Trucks (adjusted)</i>				5,741,373	32.3	5,741,380	
VTA Model w/RTAC	72,285	105,310	177,595	3,169,287	17.8	3,169,290	1,099,743,630
<i>without Trucks (adjusted)</i>				3,033,336	17.1	3,033,340	
Scenario 2	72,285	105,310	177,595	3,169,287	17.8	3,169,290	1,099,743,630
SCENARIO 3							
Internal VMT (passenger vehicles)				333,351		333,350	115,672,450
Internal-External VMT (passenger vehicles)				5,519,850		5,519,850	1,915,387,950
Internal VMT (trucks)				3,234		3,230	1,120,810
Internal-External VMT (trucks)				274,844		274,840	95,369,480
<i>Total Adjusted (City)</i>						6,131,270	2,127,550,690
VTA Model Total (not adjusted)	74,120	108,215	182,335	6,131,279	33.6	6,131,280	2,127,554,160
<i>without Trucks (adjusted)</i>				5,853,201	32.1	5,853,200	
VTA Model w/RTAC	74,120	108,215	182,335	3,233,932	17.7	3,233,930	1,122,173,710
<i>without Trucks (adjusted)</i>				3,093,276	17.0	3,093,275	
Scenario 3	74,120	108,215	182,335	3,233,932	17.7	3,233,930	1,122,173,710
SCENARIO 4							
Internal VMT (passenger vehicles)				310,100		310,100	107,604,700
Internal-External VMT (passenger vehicles)				5,478,397		5,478,400	1,901,004,800
Internal VMT (trucks)				3,401		3,400	1,179,800
Internal-External VMT (trucks)				283,109		283,110	98,239,170
<i>Total Adjusted (City)</i>						6,075,010	2,108,028,470
VTA Model Total (not adjusted)	76,140	110,940	187,080	6,075,007	32.5	6,075,010	2,108,028,470
<i>without Trucks (adjusted)</i>				5,788,497	30.9	5,788,500	
VTA Model w/RTAC	76,140	110,940	187,080	3,194,254	17.1	3,194,250	1,108,404,750
<i>without Trucks (adjusted)</i>				3,049,299	16.3	3,049,300	
Scenario 4	76,140	110,940	187,080	3,194,254	17.1	3,194,250	1,108,404,750
AB 32 Estimate³	70,500	104,820	175,320	2,993,461	17.1	2,993,460	1,038,730,620
¹ Passenger vehicle and truck VMT provided by Hexagon is based on the VTA Regional Transportation Demand Forecasting Model. For GHG emissions modeling, the transportation sector proportions 50 percent of the trip length for trips that occur outside of the City boundaries. Per the Regional Targets Advisory Committee (RTAC) under Senate Bill 375 (SB 375), 50 percent of the trip length for intrajurisdictional trips are the responsibility of the adjacent/corresponding jurisdiction while the other 50 percent are the responsibility of the City of Palo Alto. External-Internal and Internal-External trips include 50 percent of the trip length in accordance with these recommendations.							
² Daily VMT multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.							
³ VMT estimated using the VMT/SP rate and VMT by classifications for 2014.							

Percent VMT by Classification	2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Percent Passenger Vehicles	96%	98%	96%	96%	95%
Percent Trucks	4%	2%	4%	4%	5%

CRITERIA AIR POLLUTANTS

	lbs/day					
	ROG	NOx	CO	SOx	PM10	PM2.5
VMT 2012 - City only (F&P) ¹	326	1,367	9,447	16	244	109
Year 2014 - Existing City	327	1,396	10,017	21	315	135
2030 - Existing City	104	281	3,084	13	304	124
Scenario 1	113	276	3,365	13	329	135
Scenario 2	111	271	3,312	13	324	132
Scenario 3	114	277	3,380	13	331	135
Scenario 4	112	274	3,338	13	327	134
	Tons/year					
	ROG	NOx	CO	SOx	PM10	PM2.5
VMT 2012 - City only (F&P) ¹	56	237	1,639	3	42	19
Year 2014 - Existing City	57	242	1,738	4	55	23
2030 - Existing City	18	49	535	2	53	22
Scenario 1	20	48	584	2	57	23
Scenario 2	19	47	575	2	56	23
Scenario 3	20	48	586	2	57	23
Scenario 4	19	47	579	2	57	23
Daily emissions multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.						
Source: EMFAC2014-PL. Based on running exhaust, breakwear, and tirewear emission rates.						

GHG EMISSIONS

	MTons/year				CO ₂ e lbs/Mile	CO ₂ e lbs/SP/day
	CO ₂	CH ₄	N ₂ O	CO ₂ e		
Year 2014 - Existing City	326,864	13	7	329,296	0.71	12.34
Scenario 1	209,070	5	1	209,599	0.41	6.91
Scenario 2	205,758	5	1	206,278	0.41	7.02
Scenario 3	209,954	5	1	210,486	0.41	6.97
Scenario 4	207,378	5	1	207,903	0.41	6.71
AB 32 Year 2020	282,905	7	3	284,141	0.60	9.79
Source: EMFAC2014-PL. Based on the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report Global Warming Potentials (GWPs)						
Note: MTons = metric tons; CO ₂ e = carbon dioxide-equivalent. Includes Pavley + California Advanced Clean Car Standards, the Low Carbon Fuel Standard (LCFS), on-road diesel fleet rules, and the Smartway/Phase I Heavy Duty Vehicle Greenhouse Gas Regulation.						
Unlike EMFAC2011, EMFAC2014 does not identify GHG emissions rates with Pavley+LCFS and rates without these GHG emissions regulations. Therefore, only the "with reductions" rate is included.						
¹ Fehr & Peers, 2013, March 19. City of Palo Alto Climate Protection Plan On-Road Community Transportation Inventory (Table 7).						

Year 2014 - Existing City

Based on EMFAC2014

Emission year	Daily							
2014	2,937,470		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.07%	0.02%	1.69E-01	5.82E+00	5.47E-01	1.18E-02	2.35E-01	1.42E-01
LDA	57.57%	67.19%	1.21E+02	4.73E+02	5.24E+03	1.22E+01	2.02E+02	8.40E+01
LDT1	4.59%	5.36%	3.22E+01	9.65E+01	1.03E+03	1.14E+00	1.68E+01	7.33E+00
LDT2	19.41%	22.65%	5.20E+01	2.75E+02	2.32E+03	5.59E+00	6.78E+01	2.80E+01
LHD1	2.04%	0.47%	2.77E+00	6.21E+01	4.54E+01	1.87E-01	2.99E+00	1.41E+00
LHD2	0.48%	0.11%	6.14E-01	1.78E+01	6.91E+00	4.46E-02	8.38E-01	4.05E-01
MCY	0.55%	0.65%	9.28E+01	4.48E+01	8.69E+02	7.71E-02	7.18E-01	3.09E-01
MDV	11.71%	2.72%	9.87E+00	5.24E+01	3.95E+02	8.60E-01	8.18E+00	3.40E+00
MH	0.10%	0.02%	4.32E-01	2.96E+00	1.24E+01	1.64E-02	2.53E-01	1.27E-01
Motor Coach	0.03%	0.01%	1.18E-01	3.87E+00	4.40E-01	7.30E-03	1.04E-01	6.56E-02
OBUS	0.09%	0.02%	9.71E-02	7.72E-01	3.20E+00	1.47E-02	1.86E-01	7.73E-02
SBUS	0.06%	0.01%	1.28E-01	5.21E+00	2.52E+00	7.74E-03	6.84E-01	3.14E-01
T6 Ag	0.01%	0.00%	7.04E-02	9.31E-01	2.32E-01	9.03E-04	5.77E-02	4.87E-02
T6 CAIRP Heavy	0.00%	0.00%	3.40E-03	9.22E-02	1.14E-02	2.61E-04	5.23E-03	3.15E-03
T6 CAIRP Small	0.00%	0.00%	1.76E-02	3.28E-01	5.85E-02	8.07E-04	2.25E-02	1.58E-02
T6 Instate Construction Heavy	0.05%	0.01%	1.83E-01	4.62E+00	6.47E-01	7.37E-03	2.03E-01	1.42E-01
T6 Instate Construction Small	0.11%	0.02%	4.40E-01	8.34E+00	1.50E+00	1.73E-02	5.09E-01	3.65E-01
T6 Instate Heavy	0.27%	0.06%	9.07E-01	2.01E+01	3.00E+00	4.37E-02	1.07E+00	7.16E-01
T6 Instate Small	0.64%	0.15%	3.34E+00	6.10E+01	1.15E+01	1.04E-01	3.50E+00	2.61E+00
T6 OOS Heavy	0.00%	0.00%	1.37E-03	4.79E-02	4.51E-03	1.51E-04	2.59E-03	1.42E-03
T6 OOS Small	0.00%	0.00%	1.01E-02	1.88E-01	3.35E-02	4.63E-04	1.29E-02	9.07E-03
T6 Public	0.03%	0.01%	1.97E-02	2.63E+00	6.70E-02	4.44E-03	6.91E-02	3.50E-02
T6 Utility	0.00%	0.00%	2.65E-03	1.64E-01	9.23E-03	8.21E-04	1.10E-02	4.94E-03
T6TS	0.14%	0.03%	5.68E-01	3.50E+00	1.78E+01	2.47E-02	3.13E-01	1.32E-01
T7 Ag	0.00%	0.00%	1.02E-01	1.26E+00	5.03E-01	1.19E-03	7.40E-02	6.66E-02
T7 CAIRP	0.28%	0.06%	1.06E+00	2.77E+01	3.94E+00	6.77E-02	7.66E-01	4.88E-01
T7 CAIRP Construction	0.03%	0.01%	1.60E-01	4.13E+00	5.62E-01	7.97E-03	1.10E-01	7.78E-02
T7 NNOOS	0.35%	0.08%	5.78E-01	2.00E+01	2.45E+00	8.17E-02	6.31E-01	3.01E-01
T7 NOOS	0.11%	0.03%	3.13E-01	1.03E+01	1.17E+00	2.67E-02	2.48E-01	1.41E-01
T7 Other Port	0.06%	0.01%	1.51E-01	5.04E+00	4.93E-01	1.57E-02	1.17E-01	5.72E-02
T7 POAK	0.11%	0.03%	2.80E-01	9.43E+00	8.99E-01	2.79E-02	2.10E-01	1.04E-01
T7 Public	0.03%	0.01%	4.15E-02	5.33E+00	1.87E-01	6.99E-03	6.78E-02	4.08E-02
T7 Single	0.17%	0.04%	1.24E+00	2.88E+01	5.69E+00	4.15E-02	9.93E-01	8.04E-01
T7 Single Construction	0.08%	0.02%	4.21E-01	1.18E+01	1.81E+00	2.03E-02	3.31E-01	2.44E-01
T7 SWCV	0.05%	0.01%	4.46E-02	7.35E+00	7.70E-01	2.23E-02	8.35E-02	3.48E-02
T7 Tractor	0.51%	0.12%	2.80E+00	6.58E+01	1.17E+01	1.25E-01	1.93E+00	1.40E+00
T7 Tractor Construction	0.06%	0.01%	4.60E-01	9.57E+00	1.87E+00	1.52E-02	3.08E-01	2.40E-01
T7 Utility	0.00%	0.00%	3.11E-03	1.95E-01	1.20E-02	7.02E-04	4.85E-03	2.16E-03
T7IS	0.02%	0.00%	3.12E-01	1.37E+00	1.27E+01	5.35E-03	2.39E-02	9.47E-03
UBUS	0.18%	0.04%	1.32E+00	4.59E+01	1.36E+01	4.35E-02	2.60E+00	1.41E+00
TOTAL	100%	100%	327	1,396	10,017	21	315	135

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Year 2014 - Existing City

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP		SAR GWP	
	2014	1,019,302,090	1	21		310	MTons
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO ₂ e
All Other Buses	0.07%	0.02%	1.95E+02	1.24E-03	9.15E-01	0	204
LDA	57.57%	67.19%	1.91E+05	5.78E+00	7.44E+01	2	191,590
LDT1	4.59%	5.36%	1.77E+04	1.24E+00	1.52E+01	0	17,844
LDT2	19.41%	22.65%	8.76E+04	2.56E+00	4.32E+01	1	88,052
LHD1	2.04%	0.47%	2.97E+03	9.33E-02	9.77E+00	0	3,072
LHD2	0.48%	0.11%	7.18E+02	1.30E-02	2.80E+00	0	746
MCY	0.55%	0.65%	9.50E+02	2.22E+00	7.04E+00	0	1,066
MDV	11.71%	2.72%	1.35E+04	5.17E-01	8.25E+00	0	13,560
MH	0.10%	0.02%	2.57E+02	1.46E-02	4.66E-01	0	261
Motor Coach	0.03%	0.01%	1.20E+02	8.65E-04	6.09E-01	0	127
OBUS	0.09%	0.02%	2.31E+02	5.60E-03	1.22E-01	0	232
SBUS	0.06%	0.01%	1.26E+02	4.41E-03	8.20E-01	0	134
T6 Ag	0.01%	0.00%	1.49E+01	5.14E-04	1.47E-01	0	16
T6 CAIRP Heavy	0.00%	0.00%	4.31E+00	2.49E-05	1.45E-02	0	4
T6 CAIRP Small	0.00%	0.00%	1.33E+01	1.28E-04	5.16E-02	0	14
T6 Instate Construction Heavy	0.05%	0.01%	1.22E+02	1.34E-03	7.27E-01	0	129
T6 Instate Construction Small	0.11%	0.02%	2.86E+02	3.22E-03	1.31E+00	0	299
T6 Instate Heavy	0.27%	0.06%	7.21E+02	6.63E-03	3.17E+00	0	752
T6 Instate Small	0.64%	0.15%	1.72E+03	2.44E-02	9.60E+00	0	1,814
T6 OOS Heavy	0.00%	0.00%	2.48E+00	1.00E-05	7.54E-03	0	3
T6 OOS Small	0.00%	0.00%	7.63E+00	7.36E-05	2.95E-02	0	8
T6 Public	0.03%	0.01%	7.33E+01	1.44E-04	4.14E-01	0	77
T6 Utility	0.00%	0.00%	1.35E+01	1.94E-05	2.59E-02	0	14
T6TS	0.14%	0.03%	3.85E+02	3.04E-02	5.52E-01	0	391
T7 Ag	0.00%	0.00%	1.96E+01	7.45E-04	1.98E-01	0	22
T7 CAIRP	0.28%	0.06%	1.12E+03	7.73E-03	4.36E+00	0	1,160
T7 CAIRP Construction	0.03%	0.01%	1.31E+02	1.17E-03	6.50E-01	0	138
T7 NNOOS	0.35%	0.08%	1.35E+03	4.23E-03	3.15E+00	0	1,379
T7 NOOS	0.11%	0.03%	4.41E+02	2.29E-03	1.61E+00	0	457
T7 Other Port	0.06%	0.01%	2.59E+02	1.10E-03	7.93E-01	0	266
T7 POAK	0.11%	0.03%	4.60E+02	2.04E-03	1.48E+00	0	475
T7 Public	0.03%	0.01%	1.15E+02	3.04E-04	8.40E-01	0	124
T7 Single	0.17%	0.04%	6.84E+02	9.06E-03	4.53E+00	0	729
T7 Single Construction	0.08%	0.02%	3.35E+02	3.08E-03	1.86E+00	0	353
T7 SWCV	0.05%	0.01%	4.43E+02	6.05E-02	1.16E+00	0	455
T7 Tractor	0.51%	0.12%	2.06E+03	2.05E-02	1.03E+01	0	2,160
T7 Tractor Construction	0.06%	0.01%	2.51E+02	3.36E-03	1.51E+00	0	266
T7 Utility	0.00%	0.00%	1.16E+01	2.27E-05	3.07E-02	0	12
T7IS	0.02%	0.00%	8.10E+01	1.45E-02	2.15E-01	0	83
UBUS	0.18%	0.04%	7.35E+02	4.46E-02	7.23E+00	0	807
TOTAL	100%	100%	326,864	13	220	7	329,296

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x).

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

AB 32 Year 2020 Estimate

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2020	1,038,730,620	1	21	310	MTons	
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.08%	0.02%	2.44E+02	6.31E-04	5.96E-01	0	250
LDA	60.48%	69.55%	1.68E+05	2.77E+00	3.65E+01	1	168,691
LDT1	3.82%	4.39%	1.29E+04	4.43E-01	5.50E+00	0	13,008
LDT2	18.51%	21.29%	7.18E+04	1.21E+00	1.84E+01	1	72,042
LHD1	1.55%	0.39%	2.31E+03	4.51E-02	5.53E+00	0	2,366
LHD2	0.50%	0.12%	7.54E+02	5.72E-03	1.37E+00	0	768
MCY	0.54%	0.62%	9.59E+02	2.41E+00	6.63E+00	0	1,075
MDV	10.85%	2.71%	1.20E+04	3.06E-01	4.58E+00	0	12,099
MH	0.08%	0.02%	2.18E+02	6.49E-03	2.73E-01	0	221
Motor Coach	0.03%	0.01%	1.48E+02	5.25E-04	3.58E-01	0	152
OBUS	0.09%	0.02%	2.64E+02	2.71E-03	6.00E-02	0	265
SBUS	0.06%	0.02%	1.47E+02	2.05E-03	6.17E-01	0	153
T6 Ag	0.01%	0.00%	1.56E+01	2.40E-04	6.77E-02	0	16
T6 CAIRP Heavy	0.00%	0.00%	5.44E+00	8.74E-06	5.94E-03	0	6
T6 CAIRP Small	0.01%	0.00%	1.68E+01	4.27E-05	1.50E-02	0	17
T6 Instate Construction Heavy	0.02%	0.01%	6.83E+01	1.57E-04	1.57E-01	0	70
T6 Instate Construction Small	0.05%	0.01%	1.58E+02	5.88E-04	2.23E-01	0	161
T6 Instate Heavy	0.27%	0.07%	8.16E+02	1.88E-03	1.60E+00	0	832
T6 Instate Small	0.67%	0.17%	1.99E+03	8.08E-03	2.93E+00	0	2,020
T6 OOS Heavy	0.00%	0.00%	3.12E+00	5.05E-06	3.58E-03	0	3
T6 OOS Small	0.00%	0.00%	9.62E+00	2.45E-05	8.60E-03	0	10
T6 Public	0.03%	0.01%	8.12E+01	1.25E-04	2.44E-01	0	84
T6 Utility	0.00%	0.00%	1.42E+01	1.24E-05	5.16E-03	0	14
T6TS	0.16%	0.04%	4.42E+02	1.13E-02	2.16E-01	0	444
T7 Ag	0.00%	0.00%	1.94E+01	4.19E-04	1.09E-01	0	20
T7 CAIRP	0.33%	0.08%	1.34E+03	4.68E-03	2.88E+00	0	1,366
T7 CAIRP Construction	0.02%	0.00%	6.69E+01	2.33E-04	1.46E-01	0	68
T7 NNOOS	0.41%	0.10%	1.55E+03	3.60E-03	1.46E+00	0	1,563
T7 NOOS	0.13%	0.03%	5.29E+02	1.84E-03	1.16E+00	0	540
T7 Other Port	0.07%	0.02%	2.93E+02	1.26E-03	8.04E-01	0	301
T7 POAK	0.14%	0.03%	6.03E+02	2.89E-03	1.91E+00	0	622
T7 Public	0.02%	0.01%	1.03E+02	2.60E-04	5.92E-01	0	109
T7 Single	0.16%	0.04%	7.00E+02	2.09E-03	1.98E+00	0	720
T7 Single Construction	0.04%	0.01%	1.76E+02	4.63E-04	3.93E-01	0	180
T7 SWCV	0.05%	0.01%	3.93E+02	8.91E-02	7.74E-01	0	403
T7 Tractor	0.60%	0.15%	2.51E+03	1.02E-02	7.00E+00	0	2,576
T7 Tractor Construction	0.03%	0.01%	1.32E+02	5.11E-04	3.81E-01	0	136
T7 Utility	0.00%	0.00%	1.16E+01	1.49E-05	5.43E-03	0	12
T7IS	0.02%	0.00%	8.60E+01	7.77E-03	1.50E-01	0	88
UBUS	0.16%	0.04%	6.32E+02	3.54E-02	3.95E+00	0	672
TOTAL	100%	100%	282,905	7	110	3	284,141

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x)

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

2030 - Existing City

Based on EMFAC2014

Emission year	Daily							
2030	2,937,470		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.02%	4.70E-02	7.85E-01	2.47E-01	1.56E-02	2.12E-01	9.02E-02
LDA	62.15%	70.85%	1.82E+01	1.04E+02	1.53E+03	7.32E+00	2.10E+02	8.56E+01
LDT1	3.41%	3.88%	1.95E+00	1.06E+01	1.37E+02	5.16E-01	1.16E+01	4.75E+00
LDT2	18.01%	20.53%	8.29E+00	4.78E+01	6.56E+02	3.09E+00	6.10E+01	2.50E+01
LHD1	1.19%	0.31%	6.68E-01	9.86E+00	6.20E+00	1.01E-01	1.88E+00	8.38E-01
LHD2	0.51%	0.13%	2.24E-01	1.55E+00	1.36E+00	4.50E-02	9.11E-01	4.04E-01
MCY	0.51%	0.58%	6.92E+01	3.84E+01	5.98E+02	6.95E-02	6.66E-01	2.93E-01
MDV	10.12%	2.64%	1.85E+00	1.07E+01	1.15E+02	5.40E-01	7.86E+00	3.22E+00
MH	0.07%	0.02%	2.34E-02	7.30E-01	4.44E-01	1.13E-02	1.68E-01	7.47E-02
Motor Coach	0.04%	0.01%	4.21E-02	4.99E-01	2.49E-01	9.66E-03	9.38E-02	4.06E-02
OBUS	0.10%	0.03%	1.56E-02	1.61E-01	4.36E-01	1.74E-02	2.38E-01	9.93E-02
SBUS	0.06%	0.02%	3.53E-02	1.17E+00	3.75E-01	9.13E-03	8.32E-01	3.58E-01
T6 Ag	0.00%	0.00%	2.88E-03	6.76E-02	1.52E-02	8.86E-04	1.17E-02	5.02E-03
T6 CAIRP Heavy	0.00%	0.00%	9.69E-04	1.30E-02	5.10E-03	3.60E-04	5.08E-03	2.15E-03
T6 CAIRP Small	0.01%	0.00%	2.80E-03	3.47E-02	1.47E-02	1.13E-03	1.56E-02	6.59E-03
T6 Instate Construction Heavy	0.04%	0.01%	2.04E-02	3.61E-01	1.07E-01	6.87E-03	9.31E-02	3.97E-02
T6 Instate Construction Small	0.09%	0.02%	4.31E-02	6.10E-01	1.59E-02	2.18E-01	9.24E-02	
T6 Instate Heavy	0.27%	0.07%	1.50E-01	2.80E+00	7.87E-01	4.79E-02	6.67E-01	2.84E-01
T6 Instate Small	0.69%	0.18%	3.38E-01	4.89E+00	1.78E+00	1.23E-01	1.68E+00	7.14E-01
T6 OOS Heavy	0.00%	0.00%	5.57E-04	7.50E-03	2.93E-03	2.06E-04	2.91E-03	1.23E-03
T6 OOS Small	0.00%	0.00%	1.60E-03	1.99E-02	8.45E-03	6.48E-04	8.92E-03	3.77E-03
T6 Public	0.03%	0.01%	1.34E-02	4.95E-01	6.25E-02	5.20E-03	7.20E-02	3.12E-02
T6 Utility	0.00%	0.00%	1.76E-03	2.15E-02	9.28E-03	8.60E-04	1.17E-02	4.93E-03
T6TS	0.18%	0.05%	3.50E-02	3.50E-01	1.05E+00	3.13E-02	4.28E-01	1.78E-01
T7 Ag	0.00%	0.00%	5.80E-03	1.36E-01	3.42E-02	1.06E-03	7.17E-03	2.88E-03
T7 CAIRP	0.36%	0.09%	4.30E-01	5.19E+00	2.54E+00	8.37E-02	6.35E-01	2.51E-01
T7 CAIRP Construction	0.03%	0.01%	3.21E-02	3.71E-01	1.89E-01	6.33E-03	4.69E-02	1.86E-02
T7 NNOOS	0.45%	0.12%	4.59E-01	4.73E+00	2.71E+00	1.03E-01	7.80E-01	3.04E-01
T7 NOOS	0.14%	0.04%	1.70E-01	2.06E+00	1.01E+00	3.31E-02	2.51E-01	9.92E-02
T7 Other Port	0.07%	0.02%	8.35E-02	9.37E-01	4.93E-01	1.60E-02	1.19E-01	4.73E-02
T7 POAK	0.21%	0.06%	2.64E-01	3.00E+00	1.56E+00	5.02E-02	3.74E-01	1.49E-01
T7 Public	0.02%	0.01%	2.49E-02	1.68E+00	1.14E-01	5.00E-03	3.99E-02	1.92E-02
T7 Single	0.13%	0.03%	1.39E-01	2.17E+00	8.18E-01	3.27E-02	2.29E-01	8.96E-02
T7 Single Construction	0.07%	0.02%	6.86E-02	9.37E-01	4.04E-01	1.68E-02	1.20E-01	4.67E-02
T7 SWCV	0.04%	0.01%	2.18E-02	1.90E+00	2.57E+00	6.24E-03	6.62E-02	2.58E-02
T7 Tractor	0.68%	0.18%	8.52E-01	1.19E+01	5.03E+00	1.59E-01	1.19E+00	4.74E-01
T7 Tractor Construction	0.05%	0.01%	6.57E-02	9.22E-01	3.87E-01	1.25E-02	9.09E-02	3.62E-02
T7 Utility	0.00%	0.00%	2.16E-03	2.49E-02	1.28E-02	6.86E-04	4.82E-03	1.84E-03
T7IS	0.02%	0.01%	9.75E-02	1.04E+00	1.16E+01	6.44E-03	3.31E-02	1.29E-02
UBUS	0.15%	0.04%	1.78E-01	8.66E+00	2.86E+00	2.92E-02	1.47E+00	6.79E-01
TOTAL	100%	100%	104	281	3,084	13	304	124

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 1

Based on EMFAC2014

Emission year	Daily							
2030	3,220,310		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.01%	3.04E-02	5.08E-01	1.60E-01	1.01E-02	1.37E-01	5.84E-02
LDA	62.15%	72.11%	2.04E+01	1.16E+02	1.71E+03	8.17E+00	2.34E+02	9.55E+01
LDT1	3.41%	3.95%	2.17E+00	1.19E+01	1.53E+02	5.76E-01	1.29E+01	5.30E+00
LDT2	18.01%	20.90%	9.24E+00	5.33E+01	7.31E+02	3.45E+00	6.80E+01	2.79E+01
LHD1	1.19%	0.18%	4.32E-01	6.38E+00	4.01E+00	6.55E-02	1.21E+00	5.43E-01
LHD2	0.51%	0.08%	1.45E-01	1.00E+00	8.83E-01	2.91E-02	5.90E-01	2.61E-01
MCY	0.51%	0.59%	7.72E+01	4.28E+01	6.67E+02	7.75E-02	7.43E-01	3.27E-01
MDV	10.12%	1.56%	1.20E+00	6.90E+00	7.45E+01	3.49E-01	5.09E+00	2.09E+00
MH	0.07%	0.01%	1.51E-02	4.72E-01	2.88E-01	7.29E-03	1.09E-01	4.84E-02
Motor Coach	0.04%	0.01%	2.73E-02	3.23E-01	1.61E-01	6.26E-03	6.07E-02	2.63E-02
OBUS	0.10%	0.02%	1.01E-02	1.04E-01	2.82E-01	1.13E-02	1.54E-01	6.43E-02
SBUS	0.06%	0.01%	2.28E-02	7.58E-01	2.43E-01	5.91E-03	5.38E-01	2.32E-01
T6 Ag	0.00%	0.00%	1.87E-03	4.38E-02	9.82E-03	5.74E-04	7.60E-03	3.25E-03
T6 CAIRP Heavy	0.00%	0.00%	6.27E-04	8.41E-03	3.30E-03	2.33E-04	3.29E-03	1.39E-03
T6 CAIRP Small	0.01%	0.00%	1.81E-03	2.25E-02	9.54E-03	7.32E-04	1.01E-02	4.26E-03
T6 Instate Construction Heavy	0.04%	0.01%	1.32E-02	2.33E-01	6.93E-02	4.45E-03	6.03E-02	2.57E-02
T6 Instate Construction Small	0.09%	0.01%	2.79E-02	3.95E-01	1.47E-01	1.03E-02	1.41E-01	5.98E-02
T6 Instate Heavy	0.27%	0.04%	9.68E-02	1.81E+00	5.09E-01	3.10E-02	4.32E-01	1.84E-01
T6 Instate Small	0.69%	0.11%	2.19E-01	3.17E+00	1.15E+00	7.97E-02	1.09E+00	4.62E-01
T6 OOS Heavy	0.00%	0.00%	3.60E-04	4.85E-03	1.90E-03	1.33E-04	1.88E-03	7.99E-04
T6 OOS Small	0.00%	0.00%	1.04E-03	1.29E-02	5.47E-03	4.19E-04	5.78E-03	2.44E-03
T6 Public	0.03%	0.00%	8.67E-03	3.21E-01	4.04E-02	3.36E-03	4.66E-02	2.02E-02
T6 Utility	0.00%	0.00%	1.14E-03	1.39E-02	6.01E-03	5.56E-04	7.58E-03	3.19E-03
T6TS	0.18%	0.03%	2.27E-02	2.26E-01	6.82E-01	2.03E-02	2.77E-01	1.15E-01
T7 Ag	0.00%	0.00%	3.75E-03	8.81E-02	2.22E-02	6.86E-04	4.64E-03	1.87E-03
T7 CAIRP	0.36%	0.06%	2.78E-01	3.36E+00	1.64E+00	5.42E-02	4.11E-01	1.62E-01
T7 CAIRP Construction	0.03%	0.00%	2.07E-02	2.40E-01	1.22E-01	4.10E-03	3.04E-02	1.20E-02
T7 NNOOS	0.45%	0.07%	2.97E-01	3.06E+00	1.76E+00	6.67E-02	5.05E-01	1.97E-01
T7 NOOS	0.14%	0.02%	1.10E-01	1.34E+00	6.51E-01	2.14E-02	1.62E-01	6.42E-02
T7 Other Port	0.07%	0.01%	5.41E-02	6.06E-01	3.19E-01	1.04E-02	7.72E-02	3.06E-02
T7 POAK	0.21%	0.03%	1.71E-01	1.94E+00	1.01E+00	3.25E-02	2.42E-01	9.62E-02
T7 Public	0.02%	0.00%	1.61E-02	1.09E+00	7.38E-02	3.23E-03	2.58E-02	1.24E-02
T7 Single	0.13%	0.02%	8.97E-02	1.41E+00	5.29E-01	2.12E-02	1.49E-01	5.80E-02
T7 Single Construction	0.07%	0.01%	4.44E-02	6.06E-01	2.62E-01	1.09E-02	7.77E-02	3.02E-02
T7 SWCV	0.04%	0.01%	1.41E-02	1.23E+00	1.66E+00	4.04E-03	4.29E-02	1.67E-02
T7 Tractor	0.68%	0.10%	5.52E-01	7.68E+00	3.26E+00	1.03E-01	7.72E-01	3.07E-01
T7 Tractor Construction	0.05%	0.01%	4.25E-02	5.97E-01	2.51E-01	8.06E-03	5.89E-02	2.34E-02
T7 Utility	0.00%	0.00%	1.40E-03	1.61E-02	8.27E-03	4.44E-04	3.12E-03	1.19E-03
T7IS	0.02%	0.00%	6.31E-02	6.75E-01	7.49E+00	4.17E-03	2.14E-02	8.37E-03
UBUS	0.15%	0.02%	1.15E-01	5.61E+00	1.85E+00	1.89E-02	9.49E-01	4.40E-01
TOTAL	100%	100%	113	276	3,365	13	329	135

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 1

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP		SAR GWP	
	2030	1,117,447,570	1	21		310	MTons
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.01%	1.67E+02	2.22E-04	7.99E-02	0	168
LDA	62.15%	72.11%	1.28E+05	1.28E+00	1.82E+01	1	128,655
LDT1	3.41%	3.95%	9.05E+03	1.38E-01	1.87E+00	0	9,069
LDT2	18.01%	20.90%	5.42E+04	5.86E-01	8.39E+00	0	54,329
LHD1	1.19%	0.18%	1.06E+03	6.87E-03	1.00E+00	0	1,065
LHD2	0.51%	0.08%	4.72E+02	1.44E-03	1.58E-01	0	474
MCY	0.51%	0.59%	1.01E+03	2.61E+00	6.74E+00	0	1,134
MDV	10.12%	1.56%	5.50E+03	7.51E-02	1.09E+00	0	5,510
MH	0.07%	0.01%	1.16E+02	5.88E-04	7.43E-02	0	117
Motor Coach	0.04%	0.01%	1.03E+02	1.99E-04	5.09E-02	0	104
OBUS	0.10%	0.02%	1.78E+02	6.44E-04	1.64E-02	0	178
SBUS	0.06%	0.01%	9.64E+01	4.63E-04	1.19E-01	0	98
T6 Ag	0.00%	0.00%	9.46E+00	1.36E-05	6.89E-03	0	10
T6 CAIRP Heavy	0.00%	0.00%	3.84E+00	4.59E-06	1.32E-03	0	4
T6 CAIRP Small	0.01%	0.00%	1.21E+01	1.33E-05	3.53E-03	0	12
T6 Instate Construction Heavy	0.04%	0.01%	7.34E+01	9.65E-05	3.67E-02	0	74
T6 Instate Construction Small	0.09%	0.01%	1.70E+02	2.04E-04	6.21E-02	0	170
T6 Instate Heavy	0.27%	0.04%	5.12E+02	7.08E-04	2.85E-01	0	514
T6 Instate Small	0.69%	0.11%	1.31E+03	1.60E-03	4.99E-01	0	1,320
T6 OOS Heavy	0.00%	0.00%	2.20E+00	2.63E-06	7.64E-04	0	2
T6 OOS Small	0.00%	0.00%	6.92E+00	7.59E-06	2.03E-03	0	7
T6 Public	0.03%	0.00%	5.55E+01	6.34E-05	5.05E-02	0	56
T6 Utility	0.00%	0.00%	9.18E+00	8.34E-06	2.19E-03	0	9
T6TS	0.18%	0.03%	3.20E+02	1.44E-03	3.56E-02	0	320
T7 Ag	0.00%	0.00%	1.13E+01	2.74E-05	1.39E-02	0	11
T7 CAIRP	0.36%	0.06%	8.94E+02	2.04E-03	5.29E-01	0	899
T7 CAIRP Construction	0.03%	0.00%	6.76E+01	1.52E-04	3.78E-02	0	68
T7 NNOOS	0.45%	0.07%	1.10E+03	2.17E-03	4.82E-01	0	1,105
T7 NOOS	0.14%	0.02%	3.53E+02	8.05E-04	2.10E-01	0	355
T7 Other Port	0.07%	0.01%	1.71E+02	3.95E-04	9.54E-02	0	172
T7 POAK	0.21%	0.03%	5.36E+02	1.25E-03	3.05E-01	0	539
T7 Public	0.02%	0.00%	5.34E+01	1.18E-04	1.71E-01	0	55
T7 Single	0.13%	0.02%	3.49E+02	6.56E-04	2.22E-01	0	351
T7 Single Construction	0.07%	0.01%	1.79E+02	3.25E-04	9.54E-02	0	180
T7 SWCV	0.04%	0.01%	1.93E+02	7.56E-02	1.93E-01	0	196
T7 Tractor	0.68%	0.10%	1.69E+03	4.03E-03	1.21E+00	0	1,705
T7 Tractor Construction	0.05%	0.01%	1.33E+02	3.11E-04	9.39E-02	0	134
T7 Utility	0.00%	0.00%	7.32E+00	1.02E-05	2.54E-03	0	7
T7IS	0.02%	0.00%	6.39E+01	4.01E-03	1.06E-01	0	65
UBUS	0.15%	0.02%	3.48E+02	1.36E-02	8.82E-01	0	357
TOTAL	100%	100%	209,070	5	43	1	209,599

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x).

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 2

Based on EMFAC2014

Emission year	Daily							
2030	3,169,290		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.01%	2.99E-02	5.00E-01	1.57E-01	9.96E-03	1.35E-01	5.75E-02
LDA	62.15%	72.11%	2.00E+01	1.14E+02	1.68E+03	8.04E+00	2.30E+02	9.40E+01
LDT1	3.41%	3.95%	2.14E+00	1.17E+01	1.50E+02	5.67E-01	1.27E+01	5.21E+00
LDT2	18.01%	20.90%	9.10E+00	5.25E+01	7.20E+02	3.40E+00	6.70E+01	2.74E+01
LHD1	1.19%	0.18%	4.25E-01	6.28E+00	3.95E+00	6.44E-02	1.20E+00	5.34E-01
LHD2	0.51%	0.08%	1.42E-01	9.85E-01	8.69E-01	2.87E-02	5.81E-01	2.57E-01
MCY	0.51%	0.59%	7.60E+01	4.21E+01	6.57E+02	7.63E-02	7.31E-01	3.22E-01
MDV	10.12%	1.56%	1.18E+00	6.79E+00	7.33E+01	3.44E-01	5.01E+00	2.05E+00
MH	0.07%	0.01%	1.49E-02	4.65E-01	2.83E-01	7.17E-03	1.07E-01	4.76E-02
Motor Coach	0.04%	0.01%	2.68E-02	3.18E-01	1.58E-01	6.16E-03	5.97E-02	2.59E-02
OBUS	0.10%	0.02%	9.96E-03	1.02E-01	2.78E-01	1.11E-02	1.52E-01	6.32E-02
SBUS	0.06%	0.01%	2.25E-02	7.46E-01	2.39E-01	5.82E-03	5.30E-01	2.28E-01
T6 Ag	0.00%	0.00%	1.84E-03	4.31E-02	9.66E-03	5.64E-04	7.48E-03	3.20E-03
T6 CAIRP Heavy	0.00%	0.00%	6.18E-04	8.28E-03	3.25E-03	2.29E-04	3.24E-03	1.37E-03
T6 CAIRP Small	0.01%	0.00%	1.78E-03	2.21E-02	9.39E-03	7.20E-04	9.92E-03	4.20E-03
T6 Instate Construction Heavy	0.04%	0.01%	1.30E-02	2.30E-01	6.82E-02	4.38E-03	5.93E-02	2.53E-02
T6 Instate Construction Small	0.09%	0.01%	2.74E-02	3.88E-01	1.44E-01	1.01E-02	1.39E-01	5.88E-02
T6 Instate Heavy	0.27%	0.04%	9.52E-02	1.78E+00	5.01E-01	3.05E-02	4.25E-01	1.81E-01
T6 Instate Small	0.69%	0.11%	2.16E-01	3.12E+00	1.13E+00	7.84E-02	1.07E+00	4.55E-01
T6 OOS Heavy	0.00%	0.00%	3.55E-04	4.78E-03	1.87E-03	1.31E-04	1.85E-03	7.86E-04
T6 OOS Small	0.00%	0.00%	1.02E-03	1.27E-02	5.38E-03	4.13E-04	5.68E-03	2.40E-03
T6 Public	0.03%	0.00%	8.53E-03	3.15E-01	3.98E-02	3.31E-03	4.58E-02	1.99E-02
T6 Utility	0.00%	0.00%	1.12E-03	1.37E-02	5.91E-03	5.48E-04	7.46E-03	3.14E-03
T6TS	0.18%	0.03%	2.23E-02	2.23E-01	6.72E-01	2.00E-02	2.73E-01	1.14E-01
T7 Ag	0.00%	0.00%	3.69E-03	8.67E-02	2.18E-02	6.75E-04	4.57E-03	1.84E-03
T7 CAIRP	0.36%	0.06%	2.74E-01	3.31E+00	1.62E+00	5.33E-02	4.05E-01	1.60E-01
T7 CAIRP Construction	0.03%	0.00%	2.04E-02	2.36E-01	1.20E-01	4.03E-03	2.99E-02	1.18E-02
T7 NNOOS	0.45%	0.07%	2.93E-01	3.02E+00	1.73E+00	6.56E-02	4.97E-01	1.94E-01
T7 NOOS	0.14%	0.02%	1.08E-01	1.31E+00	6.40E-01	2.11E-02	1.60E-01	6.32E-02
T7 Other Port	0.07%	0.01%	5.32E-02	5.97E-01	3.14E-01	1.02E-02	7.60E-02	3.02E-02
T7 POAK	0.21%	0.03%	1.68E-01	1.91E+00	9.94E-01	3.20E-02	2.38E-01	9.47E-02
T7 Public	0.02%	0.00%	1.59E-02	1.07E+00	7.26E-02	3.18E-03	2.54E-02	1.22E-02
T7 Single	0.13%	0.02%	8.82E-02	1.39E+00	5.21E-01	2.08E-02	1.46E-01	5.70E-02
T7 Single Construction	0.07%	0.01%	4.37E-02	5.97E-01	2.57E-01	1.07E-02	7.65E-02	2.98E-02
T7 SWCV	0.04%	0.01%	1.39E-02	1.21E+00	1.64E+00	3.97E-03	4.22E-02	1.64E-02
T7 Tractor	0.68%	0.10%	5.43E-01	7.56E+00	3.21E+00	1.01E-01	7.59E-01	3.02E-01
T7 Tractor Construction	0.05%	0.01%	4.18E-02	5.87E-01	2.47E-01	7.93E-03	5.79E-02	2.31E-02
T7 Utility	0.00%	0.00%	1.38E-03	1.59E-02	8.14E-03	4.37E-04	3.07E-03	1.17E-03
T7IS	0.02%	0.00%	6.21E-02	6.64E-01	7.38E+00	4.10E-03	2.11E-02	8.24E-03
UBUS	0.15%	0.02%	1.13E-01	5.52E+00	1.82E+00	1.86E-02	9.34E-01	4.33E-01
TOTAL	100%	100%	111	271	3,312	13	324	132

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 2

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2030	1,099,743,630	1	21	310		
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.01%	1.64E+02	2.19E-04	7.87E-02	0	165
LDA	62.15%	72.11%	1.26E+05	1.26E+00	1.79E+01	1	126,617
LDT1	3.41%	3.95%	8.90E+03	1.36E-01	1.84E+00	0	8,925
LDT2	18.01%	20.90%	5.34E+04	5.77E-01	8.26E+00	0	53,468
LHD1	1.19%	0.18%	1.04E+03	6.76E-03	9.89E-01	0	1,048
LHD2	0.51%	0.08%	4.65E+02	1.42E-03	1.55E-01	0	466
MCY	0.51%	0.59%	9.97E+02	2.57E+00	6.63E+00	0	1,117
MDV	10.12%	1.56%	5.41E+03	7.39E-02	1.07E+00	0	5,423
MH	0.07%	0.01%	1.14E+02	5.78E-04	7.31E-02	0	115
Motor Coach	0.04%	0.01%	1.02E+02	1.96E-04	5.01E-02	0	102
OBUS	0.10%	0.02%	1.75E+02	6.33E-04	1.61E-02	0	175
SBUS	0.06%	0.01%	9.49E+01	4.55E-04	1.17E-01	0	96
T6 Ag	0.00%	0.00%	9.31E+00	1.34E-05	6.78E-03	0	9
T6 CAIRP Heavy	0.00%	0.00%	3.78E+00	4.51E-06	1.30E-03	0	4
T6 CAIRP Small	0.01%	0.00%	1.19E+01	1.30E-05	3.48E-03	0	12
T6 Instate Construction Heavy	0.04%	0.01%	7.22E+01	9.49E-05	3.62E-02	0	73
T6 Instate Construction Small	0.09%	0.01%	1.67E+02	2.00E-04	6.11E-02	0	168
T6 Instate Heavy	0.27%	0.04%	5.03E+02	6.96E-04	2.81E-01	0	506
T6 Instate Small	0.69%	0.11%	1.29E+03	1.58E-03	4.91E-01	0	1,299
T6 OOS Heavy	0.00%	0.00%	2.17E+00	2.59E-06	7.52E-04	0	2
T6 OOS Small	0.00%	0.00%	6.81E+00	7.47E-06	1.99E-03	0	7
T6 Public	0.03%	0.00%	5.46E+01	6.24E-05	4.97E-02	0	55
T6 Utility	0.00%	0.00%	9.04E+00	8.21E-06	2.15E-03	0	9
T6TS	0.18%	0.03%	3.15E+02	1.42E-03	3.51E-02	0	315
T7 Ag	0.00%	0.00%	1.11E+01	2.70E-05	1.36E-02	0	11
T7 CAIRP	0.36%	0.06%	8.80E+02	2.00E-03	5.20E-01	0	885
T7 CAIRP Construction	0.03%	0.00%	6.65E+01	1.49E-04	3.72E-02	0	67
T7 NNOOS	0.45%	0.07%	1.08E+03	2.14E-03	4.75E-01	0	1,087
T7 NOOS	0.14%	0.02%	3.48E+02	7.93E-04	2.07E-01	0	350
T7 Other Port	0.07%	0.01%	1.68E+02	3.89E-04	9.39E-02	0	169
T7 POAK	0.21%	0.03%	5.28E+02	1.23E-03	3.01E-01	0	531
T7 Public	0.02%	0.00%	5.25E+01	1.16E-04	1.69E-01	0	54
T7 Single	0.13%	0.02%	3.44E+02	6.45E-04	2.18E-01	0	346
T7 Single Construction	0.07%	0.01%	1.76E+02	3.20E-04	9.39E-02	0	177
T7 SWCV	0.04%	0.01%	1.90E+02	7.44E-02	1.90E-01	0	193
T7 Tractor	0.68%	0.10%	1.67E+03	3.97E-03	1.19E+00	0	1,678
T7 Tractor Construction	0.05%	0.01%	1.31E+02	3.06E-04	9.24E-02	0	132
T7 Utility	0.00%	0.00%	7.21E+00	1.01E-05	2.50E-03	0	7
T7IS	0.02%	0.00%	6.29E+01	3.95E-03	1.05E-01	0	64
UBUS	0.15%	0.02%	3.43E+02	1.34E-02	8.68E-01	0	351
TOTAL	100%	100%	205,758	5	43	1	206,278

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x)

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 3

Based on EMFAC2014

Emission year	Daily							
2030	3,233,930		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.01%	3.05E-02	5.10E-01	1.61E-01	1.02E-02	1.38E-01	5.86E-02
LDA	62.15%	72.11%	2.04E+01	1.16E+02	1.72E+03	8.20E+00	2.35E+02	9.59E+01
LDT1	3.41%	3.95%	2.18E+00	1.19E+01	1.53E+02	5.79E-01	1.30E+01	5.32E+00
LDT2	18.01%	20.90%	9.28E+00	5.36E+01	7.35E+02	3.46E+00	6.83E+01	2.80E+01
LHD1	1.19%	0.18%	4.34E-01	6.41E+00	4.03E+00	6.58E-02	1.22E+00	5.45E-01
LHD2	0.51%	0.08%	1.45E-01	1.00E+00	8.86E-01	2.93E-02	5.92E-01	2.62E-01
MCY	0.51%	0.59%	7.75E+01	4.30E+01	6.70E+02	7.79E-02	7.46E-01	3.29E-01
MDV	10.12%	1.56%	1.20E+00	6.92E+00	7.48E+01	3.51E-01	5.11E+00	2.10E+00
MH	0.07%	0.01%	1.52E-02	4.74E-01	2.89E-01	7.32E-03	1.09E-01	4.86E-02
Motor Coach	0.04%	0.01%	2.74E-02	3.25E-01	1.62E-01	6.28E-03	6.10E-02	2.64E-02
OBUS	0.10%	0.02%	1.02E-02	1.04E-01	2.84E-01	1.13E-02	1.55E-01	6.45E-02
SBUS	0.06%	0.01%	2.29E-02	7.61E-01	2.44E-01	5.94E-03	5.41E-01	2.33E-01
T6 Ag	0.00%	0.00%	1.87E-03	4.40E-02	9.86E-03	5.76E-04	7.63E-03	3.26E-03
T6 CAIRP Heavy	0.00%	0.00%	6.30E-04	8.44E-03	3.32E-03	2.34E-04	3.30E-03	1.40E-03
T6 CAIRP Small	0.01%	0.00%	1.82E-03	2.26E-02	9.58E-03	7.35E-04	1.01E-02	4.28E-03
T6 Instate Construction Heavy	0.04%	0.01%	1.33E-02	2.34E-01	6.96E-02	4.47E-03	6.05E-02	2.58E-02
T6 Instate Construction Small	0.09%	0.01%	2.80E-02	3.96E-01	1.47E-01	1.03E-02	1.41E-01	6.00E-02
T6 Instate Heavy	0.27%	0.04%	9.72E-02	1.82E+00	5.12E-01	3.11E-02	4.34E-01	1.85E-01
T6 Instate Small	0.69%	0.11%	2.20E-01	3.18E+00	1.16E+00	8.00E-02	1.09E+00	4.64E-01
T6 OOS Heavy	0.00%	0.00%	3.62E-04	4.87E-03	1.90E-03	1.34E-04	1.89E-03	8.02E-04
T6 OOS Small	0.00%	0.00%	1.04E-03	1.29E-02	5.49E-03	4.21E-04	5.80E-03	2.45E-03
T6 Public	0.03%	0.00%	8.70E-03	3.22E-01	4.06E-02	3.38E-03	4.68E-02	2.03E-02
T6 Utility	0.00%	0.00%	1.15E-03	1.40E-02	6.03E-03	5.59E-04	7.62E-03	3.21E-03
T6TS	0.18%	0.03%	2.28E-02	2.27E-01	6.85E-01	2.04E-02	2.78E-01	1.16E-01
T7 Ag	0.00%	0.00%	3.77E-03	8.84E-02	2.23E-02	6.89E-04	4.66E-03	1.87E-03
T7 CAIRP	0.36%	0.06%	2.80E-01	3.37E+00	1.65E+00	5.44E-02	4.13E-01	1.63E-01
T7 CAIRP Construction	0.03%	0.00%	2.08E-02	2.41E-01	1.23E-01	4.11E-03	3.05E-02	1.21E-02
T7 NNOOS	0.45%	0.07%	2.99E-01	3.08E+00	1.76E+00	6.69E-02	5.07E-01	1.98E-01
T7 NOOS	0.14%	0.02%	1.11E-01	1.34E+00	6.53E-01	2.15E-02	1.63E-01	6.45E-02
T7 Other Port	0.07%	0.01%	5.43E-02	6.09E-01	3.21E-01	1.04E-02	7.76E-02	3.08E-02
T7 POAK	0.21%	0.03%	1.72E-01	1.95E+00	1.01E+00	3.26E-02	2.43E-01	9.66E-02
T7 Public	0.02%	0.00%	1.62E-02	1.09E+00	7.41E-02	3.25E-03	2.59E-02	1.25E-02
T7 Single	0.13%	0.02%	9.00E-02	1.41E+00	5.32E-01	2.13E-02	1.49E-01	5.82E-02
T7 Single Construction	0.07%	0.01%	4.46E-02	6.09E-01	2.63E-01	1.09E-02	7.80E-02	3.04E-02
T7 SWCV	0.04%	0.01%	1.42E-02	1.23E+00	1.67E+00	4.05E-03	4.30E-02	1.68E-02
T7 Tractor	0.68%	0.10%	5.54E-01	7.71E+00	3.27E+00	1.03E-01	7.75E-01	3.08E-01
T7 Tractor Construction	0.05%	0.01%	4.27E-02	5.99E-01	2.52E-01	8.10E-03	5.91E-02	2.35E-02
T7 Utility	0.00%	0.00%	1.41E-03	1.62E-02	8.31E-03	4.46E-04	3.13E-03	1.19E-03
T7IS	0.02%	0.00%	6.33E-02	6.78E-01	7.53E+00	4.19E-03	2.15E-02	8.41E-03
UBUS	0.15%	0.02%	1.16E-01	5.63E+00	1.86E+00	1.90E-02	9.53E-01	4.41E-01
TOTAL	100%	100%	114	277	3,380	13	331	135

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 3

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2030	1,122,173,710	1	21	310	MTons	
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.01%	1.68E+02	2.23E-04	8.03E-02	0	169
LDA	62.15%	72.11%	1.29E+05	1.28E+00	1.83E+01	1	129,199
LDT1	3.41%	3.95%	9.09E+03	1.38E-01	1.88E+00	0	9,107
LDT2	18.01%	20.90%	5.45E+04	5.88E-01	8.43E+00	0	54,559
LHD1	1.19%	0.18%	1.06E+03	6.90E-03	1.01E+00	0	1,070
LHD2	0.51%	0.08%	4.74E+02	1.45E-03	1.58E-01	0	476
MCY	0.51%	0.59%	1.02E+03	2.62E+00	6.77E+00	0	1,139
MDV	10.12%	1.56%	5.52E+03	7.55E-02	1.09E+00	0	5,533
MH	0.07%	0.01%	1.16E+02	5.90E-04	7.46E-02	0	117
Motor Coach	0.04%	0.01%	1.04E+02	2.00E-04	5.11E-02	0	104
OBUS	0.10%	0.02%	1.79E+02	6.46E-04	1.64E-02	0	179
SBUS	0.06%	0.01%	9.68E+01	4.65E-04	1.20E-01	0	98
T6 Ag	0.00%	0.00%	9.50E+00	1.37E-05	6.92E-03	0	10
T6 CAIRP Heavy	0.00%	0.00%	3.86E+00	4.61E-06	1.33E-03	0	4
T6 CAIRP Small	0.01%	0.00%	1.21E+01	1.33E-05	3.55E-03	0	12
T6 Instate Construction Heavy	0.04%	0.01%	7.37E+01	9.69E-05	3.69E-02	0	74
T6 Instate Construction Small	0.09%	0.01%	1.70E+02	2.05E-04	6.24E-02	0	171
T6 Instate Heavy	0.27%	0.04%	5.14E+02	7.10E-04	2.87E-01	0	517
T6 Instate Small	0.69%	0.11%	1.32E+03	1.61E-03	5.01E-01	0	1,325
T6 OOS Heavy	0.00%	0.00%	2.21E+00	2.65E-06	7.67E-04	0	2
T6 OOS Small	0.00%	0.00%	6.95E+00	7.63E-06	2.03E-03	0	7
T6 Public	0.03%	0.00%	5.57E+01	6.36E-05	5.07E-02	0	56
T6 Utility	0.00%	0.00%	9.22E+00	8.38E-06	2.20E-03	0	9
T6TS	0.18%	0.03%	3.21E+02	1.45E-03	3.58E-02	0	321
T7 Ag	0.00%	0.00%	1.14E+01	2.76E-05	1.39E-02	0	12
T7 CAIRP	0.36%	0.06%	8.98E+02	2.04E-03	5.31E-01	0	903
T7 CAIRP Construction	0.03%	0.00%	6.79E+01	1.52E-04	3.79E-02	0	68
T7 NNOOS	0.45%	0.07%	1.10E+03	2.18E-03	4.84E-01	0	1,109
T7 NOOS	0.14%	0.02%	3.55E+02	8.09E-04	2.11E-01	0	357
T7 Other Port	0.07%	0.01%	1.72E+02	3.97E-04	9.59E-02	0	173
T7 POAK	0.21%	0.03%	5.39E+02	1.26E-03	3.07E-01	0	542
T7 Public	0.02%	0.00%	5.36E+01	1.18E-04	1.72E-01	0	55
T7 Single	0.13%	0.02%	3.51E+02	6.58E-04	2.22E-01	0	353
T7 Single Construction	0.07%	0.01%	1.80E+02	3.26E-04	9.58E-02	0	181
T7 SWCV	0.04%	0.01%	1.94E+02	7.59E-02	1.94E-01	0	197
T7 Tractor	0.68%	0.10%	1.70E+03	4.05E-03	1.21E+00	0	1,713
T7 Tractor Construction	0.05%	0.01%	1.34E+02	3.12E-04	9.43E-02	0	135
T7 Utility	0.00%	0.00%	7.35E+00	1.03E-05	2.55E-03	0	7
T7IS	0.02%	0.00%	6.42E+01	4.03E-03	1.07E-01	0	65
UBUS	0.15%	0.02%	3.50E+02	1.36E-02	8.86E-01	0	359
TOTAL	100%	100%	209,954	5	44	1	210,486

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x).

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 4

Based on EMFAC2014

Emission year	Daily							
2030	3,194,250		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.01%	3.01E-02	5.04E-01	1.59E-01	1.00E-02	1.36E-01	5.79E-02
LDA	62.15%	72.11%	2.02E+01	1.15E+02	1.70E+03	8.10E+00	2.32E+02	9.47E+01
LDT1	3.41%	3.95%	2.15E+00	1.18E+01	1.51E+02	5.71E-01	1.28E+01	5.26E+00
LDT2	18.01%	20.90%	9.17E+00	5.29E+01	7.26E+02	3.42E+00	6.75E+01	2.76E+01
LHD1	1.19%	0.18%	4.29E-01	6.33E+00	3.98E+00	6.49E-02	1.20E+00	5.38E-01
LHD2	0.51%	0.08%	1.44E-01	9.93E-01	8.75E-01	2.89E-02	5.85E-01	2.59E-01
MCY	0.51%	0.59%	7.66E+01	4.25E+01	6.62E+02	7.69E-02	7.37E-01	3.25E-01
MDV	10.12%	1.56%	1.19E+00	6.84E+00	7.39E+01	3.47E-01	5.05E+00	2.07E+00
MH	0.07%	0.01%	1.50E-02	4.68E-01	2.85E-01	7.23E-03	1.08E-01	4.80E-02
Motor Coach	0.04%	0.01%	2.70E-02	3.21E-01	1.60E-01	6.21E-03	6.02E-02	2.61E-02
OBUS	0.10%	0.02%	1.00E-02	1.03E-01	2.80E-01	1.12E-02	1.53E-01	6.37E-02
SBUS	0.06%	0.01%	2.27E-02	7.52E-01	2.41E-01	5.86E-03	5.34E-01	2.30E-01
T6 Ag	0.00%	0.00%	1.85E-03	4.34E-02	9.74E-03	5.69E-04	7.54E-03	3.22E-03
T6 CAIRP Heavy	0.00%	0.00%	6.22E-04	8.34E-03	3.28E-03	2.31E-04	3.26E-03	1.38E-03
T6 CAIRP Small	0.01%	0.00%	1.80E-03	2.23E-02	9.47E-03	7.26E-04	1.00E-02	4.23E-03
T6 Instate Construction Heavy	0.04%	0.01%	1.31E-02	2.31E-01	6.88E-02	4.41E-03	5.98E-02	2.55E-02
T6 Instate Construction Small	0.09%	0.01%	2.76E-02	3.91E-01	1.45E-01	1.02E-02	1.40E-01	5.93E-02
T6 Instate Heavy	0.27%	0.04%	9.60E-02	1.80E+00	5.05E-01	3.08E-02	4.28E-01	1.82E-01
T6 Instate Small	0.69%	0.11%	2.17E-01	3.14E+00	1.14E+00	7.90E-02	1.08E+00	4.58E-01
T6 OOS Heavy	0.00%	0.00%	3.57E-04	4.81E-03	1.88E-03	1.32E-04	1.87E-03	7.92E-04
T6 OOS Small	0.00%	0.00%	1.03E-03	1.28E-02	5.42E-03	4.16E-04	5.73E-03	2.42E-03
T6 Public	0.03%	0.00%	8.60E-03	3.18E-01	4.01E-02	3.34E-03	4.62E-02	2.00E-02
T6 Utility	0.00%	0.00%	1.13E-03	1.38E-02	5.96E-03	5.52E-04	7.52E-03	3.17E-03
T6TS	0.18%	0.03%	2.25E-02	2.25E-01	6.77E-01	2.01E-02	2.75E-01	1.15E-01
T7 Ag	0.00%	0.00%	3.72E-03	8.73E-02	2.20E-02	6.81E-04	4.61E-03	1.85E-03
T7 CAIRP	0.36%	0.06%	2.76E-01	3.33E+00	1.63E+00	5.37E-02	4.08E-01	1.61E-01
T7 CAIRP Construction	0.03%	0.00%	2.06E-02	2.38E-01	1.21E-01	4.06E-03	3.01E-02	1.19E-02
T7 NNOOS	0.45%	0.07%	2.95E-01	3.04E+00	1.74E+00	6.61E-02	5.01E-01	1.95E-01
T7 NOOS	0.14%	0.02%	1.09E-01	1.32E+00	6.45E-01	2.12E-02	1.61E-01	6.37E-02
T7 Other Port	0.07%	0.01%	5.36E-02	6.02E-01	3.17E-01	1.03E-02	7.66E-02	3.04E-02
T7 POAK	0.21%	0.03%	1.70E-01	1.92E+00	1.00E+00	3.22E-02	2.40E-01	9.54E-02
T7 Public	0.02%	0.00%	1.60E-02	1.08E+00	7.32E-02	3.21E-03	2.56E-02	1.23E-02
T7 Single	0.13%	0.02%	8.89E-02	1.40E+00	5.25E-01	2.10E-02	1.47E-01	5.75E-02
T7 Single Construction	0.07%	0.01%	4.41E-02	6.01E-01	2.59E-01	1.08E-02	7.71E-02	3.00E-02
T7 SWCV	0.04%	0.01%	1.40E-02	1.22E+00	1.65E+00	4.00E-03	4.25E-02	1.66E-02
T7 Tractor	0.68%	0.10%	5.47E-01	7.62E+00	3.23E+00	1.02E-01	7.65E-01	3.04E-01
T7 Tractor Construction	0.05%	0.01%	4.22E-02	5.92E-01	2.49E-01	8.00E-03	5.84E-02	2.33E-02
T7 Utility	0.00%	0.00%	1.39E-03	1.60E-02	8.21E-03	4.40E-04	3.10E-03	1.18E-03
T7IS	0.02%	0.00%	6.26E-02	6.69E-01	7.43E+00	4.14E-03	2.13E-02	8.31E-03
UBUS	0.15%	0.02%	1.14E-01	5.56E+00	1.84E+00	1.88E-02	9.42E-01	4.36E-01
TOTAL	100%	100%	112	274	3,338	13	327	134

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 4

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP		SAR GWP	
	2030	1,108,404,750	1	21		310	MTons
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.01%	1.66E+02	2.20E-04	7.93E-02	0	166
LDA	62.15%	72.11%	1.27E+05	1.27E+00	1.80E+01	1	127,614
LDT1	3.41%	3.95%	8.97E+03	1.37E-01	1.85E+00	0	8,995
LDT2	18.01%	20.90%	5.38E+04	5.81E-01	8.33E+00	0	53,889
LHD1	1.19%	0.18%	1.05E+03	6.82E-03	9.97E-01	0	1,057
LHD2	0.51%	0.08%	4.68E+02	1.43E-03	1.56E-01	0	470
MCY	0.51%	0.59%	1.01E+03	2.59E+00	6.68E+00	0	1,125
MDV	10.12%	1.56%	5.45E+03	7.45E-02	1.08E+00	0	5,465
MH	0.07%	0.01%	1.15E+02	5.83E-04	7.37E-02	0	116
Motor Coach	0.04%	0.01%	1.02E+02	1.98E-04	5.05E-02	0	103
OBUS	0.10%	0.02%	1.77E+02	6.38E-04	1.62E-02	0	177
SBUS	0.06%	0.01%	9.57E+01	4.59E-04	1.18E-01	0	97
T6 Ag	0.00%	0.00%	9.39E+00	1.35E-05	6.83E-03	0	9
T6 CAIRP Heavy	0.00%	0.00%	3.81E+00	4.55E-06	1.31E-03	0	4
T6 CAIRP Small	0.01%	0.00%	1.20E+01	1.31E-05	3.51E-03	0	12
T6 Instate Construction Heavy	0.04%	0.01%	7.28E+01	9.57E-05	3.64E-02	0	73
T6 Instate Construction Small	0.09%	0.01%	1.68E+02	2.02E-04	6.16E-02	0	169
T6 Instate Heavy	0.27%	0.04%	5.07E+02	7.02E-04	2.83E-01	0	510
T6 Instate Small	0.69%	0.11%	1.30E+03	1.59E-03	4.94E-01	0	1,309
T6 OOS Heavy	0.00%	0.00%	2.18E+00	2.61E-06	7.58E-04	0	2
T6 OOS Small	0.00%	0.00%	6.86E+00	7.53E-06	2.01E-03	0	7
T6 Public	0.03%	0.00%	5.50E+01	6.28E-05	5.00E-02	0	56
T6 Utility	0.00%	0.00%	9.11E+00	8.28E-06	2.17E-03	0	9
T6TS	0.18%	0.03%	3.17E+02	1.43E-03	3.54E-02	0	317
T7 Ag	0.00%	0.00%	1.12E+01	2.72E-05	1.37E-02	0	11
T7 CAIRP	0.36%	0.06%	8.87E+02	2.02E-03	5.24E-01	0	892
T7 CAIRP Construction	0.03%	0.00%	6.70E+01	1.50E-04	3.75E-02	0	67
T7 NNOOS	0.45%	0.07%	1.09E+03	2.16E-03	4.78E-01	0	1,096
T7 NOOS	0.14%	0.02%	3.50E+02	7.99E-04	2.09E-01	0	352
T7 Other Port	0.07%	0.01%	1.69E+02	3.92E-04	9.47E-02	0	170
T7 POAK	0.21%	0.03%	5.32E+02	1.24E-03	3.03E-01	0	535
T7 Public	0.02%	0.00%	5.29E+01	1.17E-04	1.70E-01	0	55
T7 Single	0.13%	0.02%	3.46E+02	6.50E-04	2.20E-01	0	349
T7 Single Construction	0.07%	0.01%	1.78E+02	3.22E-04	9.47E-02	0	179
T7 SWCV	0.04%	0.01%	1.91E+02	7.50E-02	1.92E-01	0	195
T7 Tractor	0.68%	0.10%	1.68E+03	4.00E-03	1.20E+00	0	1,692
T7 Tractor Construction	0.05%	0.01%	1.32E+02	3.08E-04	9.31E-02	0	133
T7 Utility	0.00%	0.00%	7.26E+00	1.02E-05	2.52E-03	0	7
T7IS	0.02%	0.00%	6.34E+01	3.98E-03	1.05E-01	0	64
UBUS	0.15%	0.02%	3.45E+02	1.35E-02	8.75E-01	0	354
TOTAL	100%	100%	207,378	5	43	1	207,903

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x).

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

CITY OF PALO ALTO + SOI — TRANSPORTATION SECTOR

EMFAC2014 v1.0.7

Based on SAR GWPs

VMT	City of Palo Alto +SOI						
	Population	Employment	Service Population (SP)	Daily VMT ¹	Rate (VMT/SP) ¹	Adjusted Daily VMT	Annual VMT ²
EXISTING 2014							
Internal VMT (passenger vehicles)				429,707		381,230	132,286,810
Internal-External VMT (passenger vehicles)				5,961,586		5,289,070	1,835,307,290
Internal VMT (trucks)				3,670		3,260	1,131,220
Internal-External VMT (trucks)				254,624		225,900	78,387,300
<i>Total Adjusted (City)</i>						5,899,460	2,047,112,620
VTA Model Total (not adjusted)	80,805	100,830	181,635	6,649,587	36.6	6,649,590	2,307,407,730
<i>without Trucks (adjusted)</i>				6,391,293	35.2	5,670,300	
VTA Model w/RTAC	80,805	100,830	181,635	3,541,482	19.5	3,541,480	1,228,893,560
<i>without Trucks (adjusted)</i>				3,410,500	18.8	3,025,765	
Year 2014 - Existing City + SOI	80,805	100,830	181,635	3,541,482	19.5	3,541,480	1,228,893,560
SCENARIO 1							
Internal VMT (passenger vehicles)				459,608		407,760	141,492,720
Internal-External VMT (passenger vehicles)				6,650,829		5,900,560	2,047,494,320
Internal VMT (trucks)				4,007		3,550	1,231,850
Internal-External VMT (trucks)				302,889		268,720	93,245,840
<i>Total Adjusted (City)</i>						6,580,590	2,283,464,730
VTA Model Total (not adjusted)	90,210	116,700	206,910	7,417,333	35.8	7,417,330	2,573,813,510
<i>without Trucks (adjusted)</i>				7,110,437	34.4	6,308,320	
VTA Model w/RTAC	90,210	116,700	206,910	3,940,474	19.0	3,940,470	1,367,343,090
<i>without Trucks (adjusted)</i>				3,785,023	18.3	3,358,040	
Scenario 1	90,210	116,700	206,910	3,940,474	19.0	3,940,470	1,367,343,090
SCENARIO 2							
Internal VMT (passenger vehicles)				448,088		397,540	137,946,380
Internal-External VMT (passenger vehicles)				6,449,421		5,721,870	1,985,488,890
Internal VMT (trucks)				3,623		3,210	1,113,870
Internal-External VMT (trucks)				283,847		251,830	87,385,010
<i>Total Adjusted (City)</i>						6,374,450	2,211,934,150
VTA Model Total (not adjusted)	90,210	111,070	201,280	7,184,979	35.7	7,184,980	2,493,188,060
<i>without Trucks (adjusted)</i>				6,897,509	34.3	6,119,410	
VTA Model w/RTAC	90,210	111,070	201,280	3,818,345	19.0	3,818,350	1,324,967,450
<i>without Trucks (adjusted)</i>				3,672,799	18.2	3,258,475	
Scenario 2	90,210	111,070	201,280	3,818,345	19.0	3,818,350	1,324,967,450
SCENARIO 3							
Internal VMT (passenger vehicles)				456,903		405,360	140,659,920
Internal-External VMT (passenger vehicles)				6,543,983		5,805,770	2,014,602,190
Internal VMT (trucks)				3,834		3,400	1,179,800
Internal-External VMT (trucks)				292,831		259,800	90,150,600
<i>Total Adjusted (City)</i>						6,474,330	2,246,592,510
VTA Model Total (not adjusted)	92,045	113,975	206,020	7,297,551	35.4	7,297,550	2,532,249,850
<i>without Trucks (adjusted)</i>				7,000,886	34.0	6,211,130	
VTA Model w/RTAC	92,045	113,975	206,020	3,879,144	18.8	3,879,140	1,346,061,580
<i>without Trucks (adjusted)</i>				3,728,895	18.1	3,308,245	
Scenario 3	92,045	113,975	206,020	3,879,144	18.8	3,879,140	1,346,061,580
SCENARIO 4							
Internal VMT (passenger vehicles)				431,569		382,880	132,859,360
Internal-External VMT (passenger vehicles)				6,501,004		5,767,630	2,001,367,610
Internal VMT (trucks)				4,013		3,560	1,235,320
Internal-External VMT (trucks)				301,070		267,110	92,687,170
<i>Total Adjusted (City)</i>						6,421,180	2,228,149,460
VTA Model Total (not adjusted)	94,065	116,700	210,765	7,237,656	34.3	7,237,660	2,511,468,020
<i>without Trucks (adjusted)</i>				6,932,573	32.9	6,150,510	
VTA Model w/RTAC	94,065	116,700	210,765	3,836,619	18.2	3,836,620	1,331,307,140
<i>without Trucks (adjusted)</i>				3,682,071	17.5	3,266,695	
Scenario 4	94,065	116,700	210,765	3,836,619	18.2	3,836,620	1,331,307,140
AB 32 Estimate³	88,600	110,450	199,050	3,623,367	18.2	3,214,620	1,115,473,140
¹ Passenger vehicle and truck VMT provided by Hexagon is based on the VTA Regional Transportation Demand Forecasting Model. For GHG emissions modeling, the transportation sector proportions 50 percent of the trip length for trips that occur outside of the City boundaries. Per the Regional Targets Advisory Committee (RTAC) under Senate Bill 375 (SB 375), 50 percent of the trip length for intrajurisdictional trips are the responsibility of the adjacent/corresponding jurisdiction while the other 50 percent are the responsibility of the City of Palo Alto. External-Internal and Internal-External trips include 50 percent of the trip length in accordance with these recommendations.							
² Daily VMT multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.							
³ VMT estimated using the VMT/SP rate and VMT by classifications for 2014.							

Percent VMT by Classification	2014	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Percent Passenger Vehicles	96%	96%	96%	96%	96%
Percent Trucks	4%	4%	4%	4%	4%

CRITERIA AIR POLLUTANTS

	lbs/day					
	ROG	NOx	CO	SOx	PM10	PM2.5
Year 2014 - Existing City + SOI	392	1,621	12,058	25	378	162
2030 - Existing City + SOI	125	329	3,714	15	365	149
Scenario 1	139	372	4,135	17	407	167
Scenario 2	135	361	4,006	16	394	161
Scenario 3	137	366	4,070	16	401	164
Scenario 4	136	362	4,026	16	396	162
	Tons/year					
	ROG	NOx	CO	SOx	PM10	PM2.5
Year 2014 - Existing City + SOI	68	281	2,092	4	66	28
2030 - Existing City + SOI	22	57	644	3	63	26
Scenario 1	24	65	717	3	71	29
Scenario 2	23	63	695	3	68	28
Scenario 3	24	64	706	3	70	28
Scenario 4	24	63	698	3	69	28
Daily emissions multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.						
Source: EMFAC2014-PL. Based on running exhaust, breakwear, and tirewear emission rates.						

GHG EMISSIONS

	MTons/year				CO ₂ e lbs/Mile	CO ₂ e lbs/SP/day
	CO ₂	CH ₄	N ₂ O	CO ₂ e		
Year 2014 - Existing City + SOI	391,826	15	8	394,661	0.71	13.12
Scenario 1	264,386	6	2	265,088	0.43	7.74
Scenario 2	256,192	6	2	256,873	0.43	7.71
Scenario 3	260,271	6	2	260,962	0.43	7.65
Scenario 4	257,418	6	2	258,102	0.43	7.40
AB 32 Year 2020	301,709	8	4	302,989	0.60	9.19
Source: EMFAC2014-PL. Based on the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report Global Warming Potentials (GWPs)						
Note: MTons = metric tons; CO ₂ e = carbon dioxide-equivalent. Includes Pavley + California Advanced Clean Car Standards, the Low Carbon Fuel Standard (LCFS), on-road diesel fleet rules, and the Smartway/Phase I Heavy Duty Vehicle Greenhouse Gas Regulation.						
Unlike EMFAC2011, EMFAC2014 does not identify GHG emissions rates with Pavley+LCFS and rates without these GHG emissions regulations. Therefore, only the "with reductions" rate is included.						

Year 2014 - Existing City Only

Based on EMFAC2014

Emission year	Daily		lbs/day					
2014	3,141,970							
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.07%	0.01%	1.61E-01	5.54E+00	5.21E-01	1.13E-02	2.23E-01	1.35E-01
LDA	57.57%	67.51%	1.30E+02	5.08E+02	5.63E+03	1.31E+01	2.17E+02	9.03E+01
LDT1	4.59%	5.39%	3.46E+01	1.04E+02	1.11E+03	1.22E+00	1.81E+01	7.88E+00
LDT2	19.41%	22.76%	5.59E+01	2.95E+02	2.50E+03	6.01E+00	7.29E+01	3.01E+01
LHD1	2.04%	0.42%	2.64E+00	5.91E+01	4.32E+01	1.78E-01	2.85E+00	1.34E+00
LHD2	0.48%	0.10%	5.85E-01	1.70E+01	6.59E+00	4.24E-02	7.98E-01	3.85E-01
MCY	0.55%	0.65%	9.98E+01	4.81E+01	9.34E+02	8.28E-02	7.72E-01	3.32E-01
MDV	11.71%	2.42%	9.40E+00	4.99E+01	3.76E+02	8.20E-01	7.79E+00	3.24E+00
MH	0.10%	0.02%	4.12E-01	2.82E+00	1.18E+01	1.56E-02	2.41E-01	1.21E-01
Motor Coach	0.03%	0.01%	1.13E-01	3.69E+00	4.19E-01	6.96E-03	9.88E-02	6.25E-02
OBUS	0.09%	0.02%	9.25E-02	7.36E-01	3.05E+00	1.40E-02	1.77E-01	7.37E-02
SBUS	0.06%	0.01%	1.22E-01	4.97E+00	2.40E+00	7.37E-03	6.52E-01	2.99E-01
T6 Ag	0.01%	0.00%	6.70E-02	8.87E-01	2.21E-01	8.60E-04	5.50E-02	4.64E-02
T6 CAIRP Heavy	0.00%	0.00%	3.24E-03	8.78E-02	1.08E-02	2.49E-04	4.98E-03	3.00E-03
T6 CAIRP Small	0.00%	0.00%	1.67E-02	3.12E-01	5.58E-02	7.69E-04	2.14E-02	1.51E-02
T6 Instate Construction Heavy	0.05%	0.01%	1.75E-01	4.40E+00	6.17E-01	7.02E-03	1.93E-01	1.35E-01
T6 Instate Construction Small	0.11%	0.02%	4.19E-01	7.94E+00	1.43E+00	1.65E-02	4.85E-01	3.47E-01
T6 Instate Heavy	0.27%	0.06%	8.64E-01	1.92E+01	2.86E+00	4.16E-02	1.02E+00	6.82E-01
T6 Instate Small	0.64%	0.13%	3.18E+00	5.81E+01	1.09E+01	9.93E-02	3.34E+00	2.49E+00
T6 OOS Heavy	0.00%	0.00%	1.31E-03	4.57E-02	4.30E-03	1.43E-04	2.47E-03	1.35E-03
T6 OOS Small	0.00%	0.00%	9.59E-03	1.79E-01	3.20E-02	4.41E-04	1.23E-02	8.64E-03
T6 Public	0.03%	0.01%	1.88E-02	2.51E+00	6.38E-02	4.23E-03	6.58E-02	3.33E-02
T6 Utility	0.00%	0.00%	2.53E-03	1.56E-01	8.79E-03	7.82E-04	1.05E-02	4.71E-03
T6TS	0.14%	0.03%	5.41E-01	3.34E+00	1.69E+01	2.35E-02	2.99E-01	1.25E-01
T7 Ag	0.00%	0.00%	9.71E-02	1.20E+00	4.79E-01	1.13E-03	7.05E-02	6.35E-02
T7 CAIRP	0.28%	0.06%	1.01E+00	2.64E+01	3.75E+00	6.45E-02	7.29E-01	4.65E-01
T7 CAIRP Construction	0.03%	0.01%	1.52E-01	3.93E+00	5.36E-01	7.59E-03	1.05E-01	7.41E-02
T7 NNOOS	0.35%	0.07%	5.51E-01	1.91E+01	2.33E+00	7.78E-02	6.01E-01	2.87E-01
T7 NOOS	0.11%	0.02%	2.98E-01	9.77E+00	1.11E+00	2.55E-02	2.36E-01	1.34E-01
T7 Other Port	0.06%	0.01%	1.43E-01	4.80E+00	4.69E-01	1.49E-02	1.11E-01	5.45E-02
T7 POAK	0.11%	0.02%	2.66E-01	8.98E+00	8.56E-01	2.66E-02	2.00E-01	9.93E-02
T7 Public	0.03%	0.01%	3.96E-02	5.08E+00	1.78E-01	6.66E-03	6.46E-02	3.88E-02
T7 Single	0.17%	0.03%	1.18E+00	2.74E+01	5.42E+00	3.95E-02	9.46E-01	7.66E-01
T7 Single Construction	0.08%	0.02%	4.01E-01	1.13E+01	1.73E+00	1.93E-02	3.15E-01	2.33E-01
T7 SWCV	0.05%	0.01%	4.25E-02	7.00E+00	7.34E-01	2.12E-02	7.96E-02	3.31E-02
T7 Tractor	0.51%	0.11%	2.67E+00	6.26E+01	1.12E+01	1.19E-01	1.84E+00	1.33E+00
T7 Tractor Construction	0.06%	0.01%	4.38E-01	9.12E+00	1.78E+00	1.45E-02	2.93E-01	2.29E-01
T7 Utility	0.00%	0.00%	2.96E-03	1.86E-01	1.15E-02	6.69E-04	4.62E-03	2.06E-03
T7IS	0.02%	0.00%	2.97E-01	1.30E+00	1.21E+01	5.09E-03	2.28E-02	9.02E-03
UBUS	0.18%	0.04%	1.25E+00	4.38E+01	1.29E+01	4.15E-02	2.47E+00	1.34E+00
TOTAL	100%	100%	348	1,438	10,697	22	335	143

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Year 2014 - Existing City + SOI

Based on EMFAC2014

Emission year	Daily		lbs/day					
2014	3,541,480							
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.07%	0.01%	1.82E-01	6.25E+00	5.87E-01	1.27E-02	2.52E-01	1.53E-01
LDA	57.57%	67.51%	1.47E+02	5.73E+02	6.34E+03	1.47E+01	2.45E+02	1.02E+02
LDT1	4.59%	5.39%	3.90E+01	1.17E+02	1.25E+03	1.38E+00	2.03E+01	8.88E+00
LDT2	19.41%	22.76%	6.30E+01	3.33E+02	2.81E+03	6.77E+00	8.21E+01	3.40E+01
LHD1	2.04%	0.42%	2.97E+00	6.66E+01	4.87E+01	2.01E-01	3.21E+00	1.51E+00
LHD2	0.48%	0.10%	6.59E-01	1.91E+01	7.43E+00	4.78E-02	9.00E-01	4.34E-01
MCY	0.55%	0.65%	1.12E+02	5.42E+01	1.05E+03	9.34E-02	8.70E-01	3.74E-01
MDV	11.71%	2.42%	1.06E+01	5.63E+01	4.24E+02	9.24E-01	8.79E+00	3.66E+00
MH	0.10%	0.02%	4.64E-01	3.18E+00	1.33E+01	1.76E-02	2.72E-01	1.36E-01
Motor Coach	0.03%	0.01%	1.27E-01	4.16E+00	4.73E-01	7.84E-03	1.11E-01	7.04E-02
OBUS	0.09%	0.02%	1.04E-01	8.29E-01	3.43E+00	1.58E-02	2.00E-01	8.30E-02
SBUS	0.06%	0.01%	1.38E-01	5.60E+00	2.70E+00	8.31E-03	7.35E-01	3.37E-01
T6 Ag	0.01%	0.00%	7.56E-02	1.00E+00	2.50E-01	9.69E-04	6.20E-02	5.23E-02
T6 CAIRP Heavy	0.00%	0.00%	3.66E-03	9.90E-02	1.22E-02	2.81E-04	5.62E-03	3.38E-03
T6 CAIRP Small	0.00%	0.00%	1.89E-02	3.52E-01	6.29E-02	8.67E-04	2.42E-02	1.70E-02
T6 Instate Construction Heavy	0.05%	0.01%	1.97E-01	4.96E+00	6.95E-01	7.91E-03	2.18E-01	1.52E-01
T6 Instate Construction Small	0.11%	0.02%	4.73E-01	8.96E+00	1.61E+00	1.86E-02	5.47E-01	3.92E-01
T6 Instate Heavy	0.27%	0.06%	9.74E-01	2.16E+01	3.23E+00	4.69E-02	1.15E+00	7.69E-01
T6 Instate Small	0.64%	0.13%	3.59E+00	6.55E+01	1.23E+01	1.12E-01	3.76E+00	2.80E+00
T6 OOS Heavy	0.00%	0.00%	1.47E-03	5.15E-02	4.84E-03	1.62E-04	2.78E-03	1.52E-03
T6 OOS Small	0.00%	0.00%	1.08E-02	2.02E-01	3.60E-02	4.97E-04	1.38E-02	9.74E-03
T6 Public	0.03%	0.01%	2.12E-02	2.83E+00	7.19E-02	4.77E-03	7.42E-02	3.76E-02
T6 Utility	0.00%	0.00%	2.85E-03	1.76E-01	9.91E-03	8.81E-04	1.18E-02	5.31E-03
T6TS	0.14%	0.03%	6.09E-01	3.76E+00	1.91E+01	2.65E-02	3.37E-01	1.41E-01
T7 Ag	0.00%	0.00%	1.09E-01	1.35E+00	5.40E-01	1.28E-03	7.95E-02	7.16E-02
T7 CAIRP	0.28%	0.06%	1.14E+00	2.98E+01	4.23E+00	7.27E-02	8.22E-01	5.24E-01
T7 CAIRP Construction	0.03%	0.01%	1.72E-01	4.43E+00	6.04E-01	8.56E-03	1.19E-01	8.35E-02
T7 NNOOS	0.35%	0.07%	6.21E-01	2.15E+01	2.63E+00	8.77E-02	6.77E-01	3.23E-01
T7 NOOS	0.11%	0.02%	3.36E-01	1.10E+01	1.26E+00	2.87E-02	2.66E-01	1.51E-01
T7 Other Port	0.06%	0.01%	1.62E-01	5.41E+00	5.29E-01	1.68E-02	1.26E-01	6.14E-02
T7 POAK	0.11%	0.02%	3.00E-01	1.01E+01	9.65E-01	3.00E-02	2.26E-01	1.12E-01
T7 Public	0.03%	0.01%	4.46E-02	5.73E+00	2.01E-01	7.51E-03	7.29E-02	4.38E-02
T7 Single	0.17%	0.03%	1.33E+00	3.09E+01	6.11E+00	4.46E-02	1.07E+00	8.64E-01
T7 Single Construction	0.08%	0.02%	4.53E-01	1.27E+01	1.95E+00	2.18E-02	3.55E-01	2.62E-01
T7 SWCV	0.05%	0.01%	4.79E-02	7.89E+00	8.27E-01	2.39E-02	8.97E-02	3.74E-02
T7 Tractor	0.51%	0.11%	3.01E+00	7.06E+01	1.26E+01	1.34E-01	2.07E+00	1.50E+00
T7 Tractor Construction	0.06%	0.01%	4.94E-01	1.03E+01	2.01E+00	1.63E-02	3.30E-01	2.58E-01
T7 Utility	0.00%	0.00%	3.34E-03	2.09E-01	1.29E-02	7.54E-04	5.21E-03	2.32E-03
T7IS	0.02%	0.00%	3.35E-01	1.47E+00	1.36E+01	5.74E-03	2.57E-02	1.02E-02
UBUS	0.18%	0.04%	1.41E+00	4.93E+01	1.46E+01	4.67E-02	2.79E+00	1.52E+00
TOTAL	100%	100%	392	1,621	12,058	25	378	162

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Santa Clara County 2014 - all Model
Years (40 MPH)

g/mile

Veh	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUN				CO2_RUNEX	CH4_RUNEX	EMFAC-SG	%VMT
									EX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_Total				
All Other Buses	1.59E-01	5.47E+00	5.14E-01	1.11E-02	7.81E-02	1.20E-02	1.30E-01	2.20E-01	7.48E-02	3.00E-03	5.59E-02	1.34E-01	1.17E+03	7.39E-03	30,540	0.07%
LDA	2.78E-02	1.09E-01	1.20E+00	2.80E-03	1.68E-03	8.00E-03	3.68E-02	4.64E-02	1.56E-03	2.00E-03	1.58E-02	1.93E-02	2.78E+02	8.44E-03	24,850,262	57.57%
LDT1	9.28E-02	2.78E-01	2.97E+00	3.28E-03	3.64E-03	8.00E-03	3.67E-02	4.84E-02	3.37E-03	2.00E-03	1.58E-02	2.11E-02	3.23E+02	2.27E-02	1,982,484	4.59%
LDT2	3.55E-02	1.87E-01	1.58E+00	3.81E-03	1.48E-03	8.00E-03	3.68E-02	4.62E-02	1.36E-03	2.00E-03	1.58E-02	1.91E-02	3.79E+02	1.11E-02	8,377,756	19.41%
LHD1	9.00E-02	2.02E+00	1.48E+00	6.08E-03	1.13E-02	9.45E-03	7.64E-02	9.72E-02	1.07E-02	2.36E-03	3.28E-02	4.59E-02	6.14E+02	1.93E-02	882,692	2.04%
LHD2	8.42E-02	2.44E+00	9.49E-01	6.11E-03	1.54E-02	1.04E-02	8.92E-02	1.15E-01	1.47E-02	2.61E-03	3.82E-02	5.55E-02	6.26E+02	1.14E-02	209,158	0.48%
MCY	2.22E+00	1.07E+00	2.08E+01	1.84E-03	1.43E-03	4.00E-03	1.18E-02	1.72E-02	1.35E-03	1.00E-03	5.04E-03	7.39E-03	1.44E+02	3.38E-01	238,631	0.55%
MDV	5.60E-02	2.98E-01	2.24E+00	4.89E-03	1.72E-03	8.00E-03	3.67E-02	4.65E-02	1.59E-03	2.00E-03	1.58E-02	1.93E-02	4.86E+02	1.86E-02	5,053,963	11.71%
MH	2.92E-01	2.00E+00	8.34E+00	1.10E-02	2.79E-02	1.28E-02	1.30E-01	1.71E-01	2.66E-02	3.19E-03	5.59E-02	8.57E-02	1.10E+03	6.28E-02	42,516	0.10%
Motor Coach	2.72E-01	8.90E+00	1.01E+00	1.68E-02	9.61E-02	1.20E-02	1.30E-01	2.38E-01	9.19E-02	3.00E-03	5.59E-02	1.51E-01	1.76E+03	1.26E-02	12,489	0.03%
OBUS	7.45E-02	5.93E-01	2.45E+00	1.13E-02	5.17E-04	1.20E-02	1.30E-01	1.43E-01	4.77E-04	3.00E-03	5.59E-02	5.93E-02	1.12E+03	2.73E-02	37,403	0.09%
SBUS	1.51E-01	6.13E+00	2.96E+00	9.10E-03	4.89E-02	1.07E-02	7.45E-01	8.04E-01	4.68E-02	2.67E-03	3.19E-01	3.69E-01	9.41E+02	3.29E-02	24,413	0.06%
T6 Ag	8.36E-01	1.11E+01	2.76E+00	1.07E-02	5.43E-01	1.20E-02	1.30E-01	6.86E-01	5.20E-01	3.00E-03	5.59E-02	5.79E-01	1.12E+03	3.88E-02	2,417	0.01%
T6 CAIRP Heavy	1.42E-01	3.84E+00	4.74E-01	1.09E-02	7.58E-02	1.20E-02	1.30E-01	2.18E-01	7.25E-02	3.00E-03	5.59E-02	1.31E-01	1.14E+03	6.59E-03	688	0.00%
T6 CAIRP Small	2.39E-01	4.45E+00	7.95E-01	1.10E-02	1.63E-01	1.20E-02	1.30E-01	3.06E-01	1.56E-01	3.00E-03	5.59E-02	2.15E-01	1.15E+03	1.11E-02	2,113	0.00%
T6 Instate Construction Heavy	2.71E-01	6.82E+00	9.56E-01	1.09E-02	1.57E-01	1.20E-02	1.30E-01	3.00E-01	1.51E-01	3.00E-03	5.59E-02	2.09E-01	1.14E+03	1.26E-02	19,438	0.05%
T6 Instate Construction Small	2.77E-01	5.26E+00	9.44E-01	1.09E-02	1.79E-01	1.20E-02	1.30E-01	3.21E-01	1.71E-01	3.00E-03	5.59E-02	2.30E-01	1.15E+03	1.29E-02	45,544	0.11%
T6 Instate Heavy	2.26E-01	5.01E+00	7.48E-01	1.09E-02	1.25E-01	1.20E-02	1.30E-01	2.67E-01	1.19E-01	3.00E-03	5.59E-02	1.78E-01	1.14E+03	1.05E-02	115,292	0.27%
T6 Instate Small	3.47E-01	6.34E+00	1.19E+00	1.08E-02	2.22E-01	1.20E-02	1.30E-01	3.64E-01	2.13E-01	3.00E-03	5.59E-02	2.71E-01	1.14E+03	1.61E-02	275,998	0.64%
T6 OOS Heavy	9.99E-02	3.49E+00	3.28E-01	1.10E-02	4.62E-02	1.20E-02	1.30E-01	1.89E-01	4.42E-02	3.00E-03	5.59E-02	1.03E-01	1.15E+03	4.64E-03	394	0.00%
T6 OOS Small	2.39E-01	4.45E+00	7.95E-01	1.10E-02	1.63E-01	1.20E-02	1.30E-01	3.06E-01	1.56E-01	3.00E-03	5.59E-02	2.15E-01	1.15E+03	1.11E-02	1,211	0.00%
T6 Public	4.90E-02	6.54E+00	1.66E-01	1.10E-02	2.92E-02	1.20E-02	1.30E-01	1.72E-01	2.80E-02	3.00E-03	5.59E-02	6.88E-02	1.16E+03	2.27E-03	11,560	0.03%
T6 Utility	3.67E-02	2.27E+00	1.27E-01	1.13E-02	9.86E-03	1.20E-02	1.30E-01	1.52E-01	9.43E-03	3.00E-03	5.59E-02	6.83E-02	1.19E+03	1.70E-03	2,078	0.00%
T6TS	2.61E-01	1.61E+00	8.17E+00	1.14E-02	1.81E-03	1.20E-02	1.30E-01	1.44E-01	1.68E-03	3.00E-03	5.59E-02	6.05E-02	1.12E+03	8.88E-02	62,410	0.14%
T7 Ag	1.42E+00	1.75E+01	7.00E+00	1.66E-02	9.33E-01	3.60E-02	6.17E-02	1.03E+00	8.92E-01	9.00E-03	2.65E-02	9.28E-01	1.73E+03	6.59E-02	2,061	0.00%
T7 CAIRP	2.51E-01	6.59E+00	9.36E-01	1.61E-02	8.43E-02	3.60E-02	6.17E-02	1.82E-01	8.06E-02	9.00E-03	2.65E-02	1.16E-01	1.69E+03	1.17E-02	120,736	0.28%
T7 CAIRP Construction	3.33E-01	8.59E+00	1.17E+00	1.66E-02	1.32E-01	3.60E-02	6.17E-02	2.30E-01	1.26E-01	9.00E-03	2.65E-02	1.62E-01	1.74E+03	1.55E-02	13,789	0.03%
T7 NNOOS	1.11E-01	3.84E+00	4.70E-01	1.57E-02	2.32E-02	3.60E-02	6.17E-02	1.21E-01	2.22E-02	9.00E-03	2.65E-02	5.77E-02	1.64E+03	5.15E-03	149,713	0.35%
T7 NOOS	1.88E-01	6.17E+00	7.04E-01	1.61E-02	5.15E-02	3.60E-02	6.17E-02	1.49E-01	4.92E-02	9.00E-03	2.65E-02	8.47E-02	1.69E+03	8.74E-03	47,691	0.11%
T7 Other Port	1.60E-01	5.35E+00	5.23E-01	1.66E-02	2.64E-02	3.60E-02	6.17E-02	1.24E-01	2.53E-02	9.00E-03	2.65E-02	6.07E-02	1.74E+03	7.42E-03	27,033	0.06%
T7 POAK	1.67E-01	5.64E+00	5.38E-01	1.67E-02	2.81E-02	3.60E-02	6.17E-02	1.26E-01	2.69E-02	9.00E-03	2.65E-02	6.23E-02	1.75E+03	7.77E-03	47,975	0.11%
T7 Public	9.98E-02	1.28E+01	4.49E-01	1.68E-02	6.53E-02	3.60E-02	6.17E-02	1.63E-01	6.25E-02	9.00E-03	2.65E-02	9.80E-02	1.76E+03	4.64E-03	11,940	0.03%
T7 Single	4.94E-01	1.15E+01	2.27E+00	1.65E-02	2.98E-01	3.60E-02	6.17E-02	3.96E-01	2.85E-01	9.00E-03	2.65E-02	3.21E-01	1.73E+03	2.30E-02	71,960	0.17%
T7 Single Construction	3.39E-01	9.53E+00	1.46E+00	1.63E-02	1.68E-01	3.60E-02	6.17E-02	2.66E-01	1.61E-01	9.00E-03	2.65E-02	1.97E-01	1.71E+03	1.58E-02	35,671	0.08%
T7 SWCV	5.74E-02	9.45E+00	9.91E-01	2.87E-02	9.71E-03	3.60E-02	6.17E-02	1.07E-01	9.29E-03	9.00E-03	2.65E-02	4.47E-02	3.62E+03	4.94E-01	22,311	0.05%
T7 Tractor	3.63E-01	8.52E+00	1.52E+00	1.62E-02	1.52E-01	3.60E-02	6.17E-02	2.50E-01	1.45E-01	9.00E-03	2.65E-02	1.81E-01	1.69E+03	1.68E-02	221,585	0.51%
T7 Tractor Construction	4.97E-01	1.03E+01	2.02E+00	1.64E-02	2.34E-01	3.60E-02	6.17E-02	3.32E-01	2.24E-01	9.00E-03	2.65E-02	2.60E-01	1.72E+03	2.31E-02	26,595	0.06%
T7 Utility	7.30E-02	4.57E+00	2.82E-01	1.65E-02	1.59E-02	3.60E-02	6.17E-02	1.14E-01	1.53E-02	9.00E-03	2.65E-02	5.07E-02	1.73E+03	3.39E-03	1,224	0.00%
T7IS	1.09E+00	4.77E+00	4.42E+01	1.87E-02	1.70E-03	2.00E-02	6.17E-02	8.34E-02	1.60E-03	5.00E-03	2.65E-02	3.31E-02	1.80E+03	3.21E-01	8,224	0.02%
UBUS	4.86E-01	1.70E+01	5.01E+00	1.61E-02	2.13E-01	1.20E-02	7.34E-01	9.60E-01	2.04E-01	3.00E-03	3.15E-01	5.22E-01	1.73E+03	1.05E-01	77,648	0.18%
															43,167,607	100.00%

EMFAC2014v1.0.7 based on the average annual temperature and humidity for Palo Alto from USA.com (<http://www.usa.com/palo-alto-ca-weather.htm>) accessed March 31, 2014. Assumes an average 40 mph speed based on CalEEMod Users' Manual.

Air Quality & Greenhouse Gas Modeling

City + SOI

Santa Clara County 2014 - all Model Years (40 MPH)		##	lbs/Mile													
Veh	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUN						CO2_RUNEX	CH4_RUNEX
									EX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_Total				
All Other Buses	3.51E-04	1.21E-02	1.13E-03	2.45E-05	1.72E-04	2.65E-05	2.87E-04	4.86E-04	1.65E-04	6.61E-06	1.23E-04	2.95E-04	2.57E+00	1.63E-05		
LDA	6.14E-05	2.40E-04	2.65E-03	6.17E-06	3.71E-06	1.76E-05	8.10E-05	1.02E-04	3.44E-06	4.41E-06	3.47E-05	4.26E-05	6.14E-01	1.86E-05		
LDT1	2.05E-04	6.13E-04	6.54E-03	7.22E-06	8.03E-06	1.76E-05	1.07E-05	1.07E-04	7.43E-06	4.41E-06	3.47E-05	4.66E-05	7.13E-01	4.99E-05		
LDT2	7.82E-05	4.13E-04	3.49E-03	8.40E-06	3.25E-06	1.76E-05	8.10E-05	1.02E-04	3.00E-06	4.41E-06	3.47E-05	4.21E-05	8.36E-01	2.44E-05		
LHD1	1.98E-04	4.45E-03	3.25E-03	1.34E-05	2.48E-05	2.08E-05	1.69E-04	2.14E-04	2.37E-05	5.21E-06	7.22E-05	1.01E-04	1.35E+00	4.25E-05		
LHD2	1.86E-04	5.38E-03	2.09E-03	1.35E-05	3.39E-05	2.30E-05	1.97E-04	2.54E-04	3.24E-05	5.76E-06	8.43E-05	1.22E-04	1.38E+00	2.50E-05		
MCY	4.90E-03	2.36E-03	4.59E-02	4.07E-06	3.14E-06	8.82E-06	2.59E-05	3.79E-05	2.97E-06	2.20E-06	1.11E-05	1.63E-05	3.18E-01	7.46E-04		
MDV	1.24E-04	6.56E-04	4.94E-03	1.08E-05	3.78E-06	1.76E-05	8.10E-05	1.02E-04	3.49E-06	4.41E-06	3.47E-05	4.26E-05	1.07E+00	4.11E-05		
MH	6.44E-04	4.41E-03	1.84E-02	2.43E-05	6.16E-05	2.81E-05	2.87E-04	3.77E-04	5.87E-05	7.03E-06	1.23E-04	1.89E-04	2.43E+00	1.38E-04		
Motor Coach	5.99E-04	1.96E-02	2.23E-03	3.70E-05	2.12E-04	2.65E-05	2.87E-04	5.26E-04	2.03E-04	6.61E-06	1.23E-04	3.32E-04	3.88E+00	2.78E-05		
OBUS	1.64E-04	1.31E-03	5.41E-03	2.48E-05	1.14E-06	2.65E-05	2.87E-04	3.15E-04	1.05E-06	6.61E-06	1.23E-04	1.31E-04	2.48E+00	6.02E-05		
SBUS	3.32E-04	1.35E-02	6.52E-03	2.01E-05	1.08E-04	2.35E-05	1.64E-03	1.77E-03	1.03E-04	5.89E-06	7.04E-04	8.13E-04	2.07E+00	7.26E-05		
T6 Ag	1.84E-03	2.44E-02	6.08E-03	2.36E-05	1.20E-03	2.65E-05	2.87E-04	1.51E-03	1.15E-03	6.61E-06	1.23E-04	1.28E-03	2.48E+00	8.56E-05		
T6 CAIRP Heavy	3.13E-04	8.47E-03	1.05E-03	2.40E-05	1.67E-04	2.65E-05	2.87E-04	4.81E-04	1.60E-04	6.61E-06	1.23E-04	2.90E-04	2.52E+00	1.45E-05		
T6 CAIRP Small	5.26E-04	9.81E-03	1.75E-03	2.42E-05	3.60E-04	2.65E-05	2.87E-04	6.74E-04	3.44E-04	6.61E-06	1.23E-04	4.74E-04	2.53E+00	2.44E-05		
T6 Instate Construction Heavy	5.97E-04	1.50E-02	2.11E-03	2.40E-05	3.47E-04	2.65E-05	2.87E-04	6.61E-04	3.32E-04	6.61E-06	1.23E-04	4.62E-04	2.51E+00	2.77E-05		
T6 Instate Construction Small	6.12E-04	1.16E-02	2.08E-03	2.41E-05	3.94E-04	2.65E-05	2.87E-04	7.08E-04	3.77E-04	6.61E-06	1.23E-04	5.07E-04	2.53E+00	2.84E-05		
T6 Instate Heavy	4.98E-04	1.10E-02	1.65E-03	2.40E-05	2.75E-04	2.65E-05	2.87E-04	5.89E-04	2.63E-04	6.61E-06	1.23E-04	3.93E-04	2.51E+00	2.31E-05		
T6 Instate Small	7.66E-04	1.40E-02	2.63E-03	2.39E-05	4.90E-04	2.65E-05	2.87E-04	8.03E-04	4.69E-04	6.61E-06	1.23E-04	5.98E-04	2.50E+00	3.56E-05		
T6 OOS Heavy	2.20E-04	7.69E-03	7.24E-04	2.42E-05	1.02E-04	2.65E-05	2.87E-04	4.16E-04	9.75E-05	6.61E-06	1.23E-04	2.27E-04	2.53E+00	1.02E-05		
T6 OOS Small	5.26E-04	9.81E-03	1.75E-03	2.42E-05	3.60E-04	2.65E-05	2.87E-04	6.74E-04	3.44E-04	6.61E-06	1.23E-04	4.74E-04	2.53E+00	2.44E-05		
T6 Public	1.08E-04	1.44E-02	3.67E-04	2.43E-05	6.45E-05	2.65E-05	2.87E-04	3.78E-04	6.17E-05	6.61E-06	1.23E-04	1.91E-04	2.55E+00	5.01E-06		
T6 Utility	8.09E-05	5.00E-03	2.81E-04	2.50E-05	2.17E-05	2.65E-05	2.87E-04	3.36E-04	2.08E-05	6.61E-06	1.23E-04	1.51E-04	2.62E+00	3.76E-06		
T6TS	5.75E-04	3.55E-03	1.80E-02	2.51E-05	4.00E-06	2.65E-05	2.87E-04	3.18E-04	3.70E-06	6.61E-06	1.23E-04	1.33E-04	2.48E+00	1.96E-04		
T7 Ag	3.13E-03	3.86E-02	1.54E-02	3.65E-05	2.06E-03	7.94E-05	1.36E-04	2.27E-03	1.97E-03	1.98E-05	5.83E-05	2.05E-03	3.82E+00	1.45E-04		
T7 CAIRP	5.54E-04	1.45E-02	2.06E-03	3.55E-05	1.86E-04	7.94E-05	1.36E-04	4.01E-04	1.78E-04	1.98E-05	5.83E-05	2.56E-04	3.72E+00	2.57E-05		
T7 CAIRP Construction	7.34E-04	1.89E-02	2.58E-03	3.66E-05	2.91E-04	7.94E-05	1.36E-04	5.07E-04	2.79E-04	1.98E-05	5.83E-05	3.57E-04	3.83E+00	3.41E-05		
T7 NNOOS	2.44E-04	8.46E-03	1.04E-03	3.45E-05	5.12E-05	7.94E-05	1.36E-04	2.67E-04	4.90E-05	1.98E-05	5.83E-05	1.27E-04	3.62E+00	1.14E-05		
T7 NOOS	4.15E-04	1.36E-02	1.55E-03	3.55E-05	1.13E-04	7.94E-05	1.36E-04	3.29E-04	1.09E-04	1.98E-05	5.83E-05	1.87E-04	3.72E+00	1.93E-05		
T7 Other Port	3.52E-04	1.18E-02	1.15E-03	3.67E-05	5.82E-05	7.94E-05	1.36E-04	2.74E-04	5.57E-05	1.98E-05	5.83E-05	1.34E-04	3.84E+00	1.64E-05		
T7 POAK	3.69E-04	1.24E-02	1.19E-03	3.68E-05	6.19E-05	7.94E-05	1.36E-04	2.77E-04	5.93E-05	1.98E-05	5.83E-05	1.37E-04	3.86E+00	1.71E-05		
T7 Public	2.20E-04	2.83E-02	9.91E-04	3.71E-05	1.44E-04	7.94E-05	1.36E-04	3.60E-04	1.38E-04	1.98E-05	5.83E-05	2.16E-04	3.88E+00	1.02E-05		
T7 Single	1.09E-03	2.53E-02	5.01E-03	3.65E-05	6.58E-04	7.94E-05	1.36E-04	8.73E-04	6.29E-04	1.98E-05	5.83E-05	7.07E-04	3.82E+00	5.06E-05		
T7 Single Construction	7.48E-04	2.10E-02	3.22E-03	3.60E-05	3.71E-04	7.94E-05	1.36E-04	5.87E-04	3.55E-04	1.98E-05	5.83E-05	4.34E-04	3.77E+00	3.47E-05		
T7 SWCV	1.26E-04	2.08E-02	2.18E-03	6.32E-05	2.14E-05	7.94E-05	1.36E-04	2.37E-04	2.05E-05	1.98E-05	5.83E-05	9.87E-05	7.98E+00	1.09E-03		
T7 Tractor	8.00E-04	1.88E-02	3.34E-03	3.56E-05	3.35E-04	7.94E-05	1.36E-04	5.50E-04	3.20E-04	1.98E-05	5.83E-05	3.99E-04	3.73E+00	3.71E-05		
T7 Tractor Construction	1.09E-03	2.28E-02	4.46E-03	3.61E-05	5.16E-04	7.94E-05	1.36E-04	7.32E-04	4.94E-04	1.98E-05	5.83E-05	5.72E-04	3.79E+00	5.09E-05		
T7 Utility	1.61E-04	1.01E-02	6.23E-04	3.63E-05	3.52E-05	7.94E-05	1.36E-04	2.51E-04	3.36E-05	1.98E-05	5.83E-05	1.12E-04	3.81E+00	7.47E-06		
T7IS	2.40E-03	1.05E-02	9.74E-02	4.11E-05	3.75E-06	4.41E-05	1.36E-04	1.84E-04	3.52E-06	1.10E-05	5.83E-05	7.29E-05	3.96E+00	7.07E-04		
UBUS	1.07E-03	3.74E-02	1.11E-02	3.55E-05	4.71E-04	2.65E-05	1.62E-03	2.12E-03	4.50E-04	6.61E-06	6.94E-04	1.15E-03	3.80E+00	2.31E-04		

Santa Clara County 2014 - all Model
Years (40 MPH)

##

MTons/Mile

Veh	PM2.5_RUN													
	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	EX	PM2.5_PMTW	PM2.5_PMBW	PM2_5_Total	CO2_RUNEX	CH4_RUNEX
All Other Buses	1.59E-07	5.47E-06	5.14E-07	1.11E-08	7.81E-08	1.20E-08	1.30E-07	2.20E-07	7.48E-08	3.00E-09	5.59E-08	1.34E-07	1.17E-03	7.39E-09
LDA	2.78E-08	1.09E-07	1.20E-06	2.80E-09	1.68E-09	8.00E-09	3.68E-08	4.64E-08	1.56E-09	2.00E-09	1.58E-08	1.93E-08	2.78E-04	8.44E-09
LDT1	9.28E-08	2.78E-07	2.97E-06	3.28E-09	3.64E-09	8.00E-09	3.67E-08	4.84E-08	3.37E-09	2.00E-09	1.58E-08	2.11E-08	3.23E-04	2.27E-08
LDT2	3.55E-08	1.87E-07	1.58E-06	3.81E-09	1.48E-09	8.00E-09	3.68E-08	4.62E-08	1.36E-09	2.00E-09	1.58E-08	1.91E-08	3.79E-04	1.11E-08
LHD1	9.00E-08	2.02E-06	1.48E-06	6.08E-09	1.13E-08	9.45E-09	7.64E-08	9.72E-08	1.07E-08	2.36E-09	3.28E-08	4.59E-08	6.14E-04	1.93E-08
LHD2	8.42E-08	2.44E-06	9.49E-07	6.11E-09	1.54E-08	1.04E-08	8.92E-08	1.15E-07	1.47E-08	2.61E-09	3.82E-08	5.55E-08	6.26E-04	1.14E-08
MCY	2.22E-06	1.07E-06	2.08E-05	1.84E-09	1.43E-09	4.00E-09	1.18E-08	1.72E-08	1.35E-09	1.00E-09	5.04E-09	7.39E-09	1.44E-04	3.38E-07
MDV	5.60E-08	2.98E-07	2.24E-06	4.89E-09	1.72E-09	8.00E-09	3.67E-08	4.65E-08	1.59E-09	2.00E-09	1.58E-08	1.93E-08	4.86E-04	1.86E-08
MH	2.92E-07	2.00E-06	8.34E-06	1.10E-08	2.79E-08	1.28E-08	1.30E-07	1.71E-07	2.66E-08	3.19E-09	5.59E-08	8.57E-08	1.10E-03	6.28E-08
Motor Coach	2.72E-07	8.90E-06	1.01E-06	1.68E-08	9.61E-08	1.20E-08	1.30E-07	2.38E-07	9.19E-08	3.00E-09	5.59E-08	1.51E-07	1.76E-03	1.26E-08
OBUS	7.45E-08	5.93E-07	2.45E-06	1.13E-08	5.17E-10	1.20E-08	1.30E-07	1.43E-07	4.77E-10	3.00E-09	5.59E-08	5.93E-08	1.12E-03	2.73E-08
SBUS	1.51E-07	6.13E-06	2.96E-06	9.10E-09	4.89E-08	1.07E-08	7.45E-07	8.04E-07	4.68E-08	2.67E-09	3.19E-07	3.69E-07	9.41E-04	3.29E-08
T6 Ag	8.36E-07	1.11E-05	2.76E-06	1.07E-08	5.43E-07	1.20E-08	1.30E-07	6.86E-07	5.20E-07	3.00E-09	5.59E-08	5.79E-07	1.12E-03	3.88E-08
T6 CAIRP Heavy	1.42E-07	3.84E-06	4.74E-07	1.09E-08	7.58E-08	1.20E-08	1.30E-07	2.18E-07	7.25E-08	3.00E-09	5.59E-08	1.31E-07	1.14E-03	6.59E-09
T6 CAIRP Small	2.39E-07	4.45E-06	7.95E-07	1.10E-08	1.63E-07	1.20E-08	1.30E-07	3.06E-07	1.56E-07	3.00E-09	5.59E-08	2.15E-07	1.15E-03	1.11E-08
T6 Instate Construction Heavy	2.71E-07	6.82E-06	9.56E-07	1.09E-08	1.57E-07	1.20E-08	1.30E-07	3.00E-07	1.51E-07	3.00E-09	5.59E-08	2.09E-07	1.14E-03	1.26E-08
T6 Instate Construction Small	2.77E-07	5.26E-06	9.44E-07	1.09E-08	1.79E-07	1.20E-08	1.30E-07	3.21E-07	1.71E-07	3.00E-09	5.59E-08	2.30E-07	1.15E-03	1.29E-08
T6 Instate Heavy	2.26E-07	5.01E-06	7.48E-07	1.09E-08	1.25E-07	1.20E-08	1.30E-07	2.67E-07	1.19E-07	3.00E-09	5.59E-08	1.78E-07	1.14E-03	1.05E-08
T6 Instate Small	3.47E-07	6.34E-06	1.19E-06	1.08E-08	2.22E-07	1.20E-08	1.30E-07	3.64E-07	2.13E-07	3.00E-09	5.59E-08	2.71E-07	1.14E-03	1.61E-08
T6 OOS Heavy	9.99E-08	3.49E-06	3.28E-07	1.10E-08	4.62E-08	1.20E-08	1.30E-07	1.89E-07	4.42E-08	3.00E-09	5.59E-08	1.03E-07	1.15E-03	4.64E-09
T6 OOS Small	2.39E-07	4.45E-06	7.95E-07	1.10E-08	1.63E-07	1.20E-08	1.30E-07	3.06E-07	1.56E-07	3.00E-09	5.59E-08	2.15E-07	1.15E-03	1.11E-08
T6 Public	4.90E-08	6.54E-06	1.66E-07	1.10E-08	2.92E-08	1.20E-08	1.30E-07	1.72E-07	2.80E-08	3.00E-09	5.59E-08	8.68E-08	1.16E-03	2.27E-09
T6 Utility	3.67E-08	2.27E-06	1.27E-07	1.13E-08	9.86E-09	1.20E-08	1.30E-07	1.52E-07	9.43E-09	3.00E-09	5.59E-08	6.83E-08	1.19E-03	1.70E-09
T6TS	2.61E-07	1.61E-06	8.17E-06	1.14E-08	1.81E-09	1.20E-08	1.30E-07	1.44E-07	1.68E-09	3.00E-09	5.59E-08	6.05E-08	1.12E-03	8.88E-08
T7 Ag	1.42E-06	1.75E-05	7.00E-06	1.66E-08	9.33E-07	3.60E-08	6.17E-08	1.03E-06	8.92E-07	9.00E-09	2.65E-08	9.28E-07	1.73E-03	6.59E-08
T7 CAIRP	2.51E-07	6.59E-06	9.36E-07	1.61E-08	8.43E-08	3.60E-08	6.17E-08	1.82E-07	8.06E-08	9.00E-09	2.65E-08	1.16E-07	1.69E-03	1.17E-08
T7 CAIRP Construction	3.33E-07	8.59E-06	1.17E-06	1.66E-08	1.32E-07	3.60E-08	6.17E-08	2.30E-07	1.26E-07	9.00E-09	2.65E-08	1.62E-07	1.74E-03	1.55E-08
T7 NNOOS	1.11E-07	3.84E-06	4.70E-07	1.57E-08	2.32E-08	3.60E-08	6.17E-08	1.21E-07	2.22E-08	9.00E-09	2.65E-08	5.77E-08	1.64E-03	5.15E-09
T7 NOOS	1.88E-07	6.17E-06	7.04E-07	1.61E-08	5.15E-08	3.60E-08	6.17E-08	1.49E-07	4.92E-08	9.00E-09	2.65E-08	8.47E-08	1.69E-03	8.74E-09
T7 Other Port	1.60E-07	5.35E-06	5.23E-07	1.66E-08	2.64E-08	3.60E-08	6.17E-08	1.24E-07	2.53E-08	9.00E-09	2.65E-08	6.07E-08	1.74E-03	7.42E-09
T7 POAK	1.67E-07	5.64E-06	5.38E-07	1.67E-08	2.81E-08	3.60E-08	6.17E-08	1.26E-07	2.69E-08	9.00E-09	2.65E-08	6.23E-08	1.75E-03	7.77E-09
T7 Public	9.98E-08	1.28E-05	4.49E-07	1.68E-08	6.53E-08	3.60E-08	6.17E-08	1.63E-07	6.25E-08	9.00E-09	2.65E-08	9.80E-08	1.76E-03	4.64E-09
T7 Single	4.94E-07	1.15E-05	2.27E-06	1.65E-08	2.98E-07	3.60E-08	6.17E-08	3.96E-07	2.85E-07	9.00E-09	2.65E-08	3.21E-07	1.73E-03	2.30E-08
T7 Single Construction	3.39E-07	9.53E-06	1.46E-06	1.63E-08	1.68E-07	3.60E-08	6.17E-08	2.66E-07	1.61E-07	9.00E-09	2.65E-08	1.97E-07	1.71E-03	1.58E-08
T7 SWCV	5.74E-08	9.45E-06	9.91E-07	2.87E-08	9.71E-09	3.60E-08	6.17E-08	1.07E-07	9.29E-09	9.00E-09	2.65E-08	4.47E-08	3.62E-03	4.94E-07
T7 Tractor	3.63E-07	8.52E-06	1.52E-06	1.62E-08	1.52E-07	3.60E-08	6.17E-08	2.50E-07	1.45E-07	9.00E-09	2.65E-08	1.81E-07	1.69E-03	1.68E-08
T7 Tractor Construction	4.97E-07	1.03E-05	2.02E-06	1.64E-08	2.34E-07	3.60E-08	6.17E-08	3.32E-07	2.24E-07	9.00E-09	2.65E-08	2.60E-07	1.72E-03	2.31E-08
T7 Utility	7.30E-08	4.57E-06	2.82E-07	1.65E-08	1.59E-08	3.60E-08	6.17E-08	1.14E-07	1.53E-08	9.00E-09	2.65E-08	5.07E-08	1.73E-03	3.39E-09
T7IS	1.09E-06	4.77E-06	4.42E-05	1.87E-08	1.70E-09	2.00E-08	6.17E-08	8.34E-08	1.60E-09	5.00E-09	2.65E-08	3.31E-08	1.80E-03	3.21E-07
UBUS	4.86E-07	1.70E-05	5.01E-06	1.61E-08	2.13E-07	1.20E-08	7.34E-07	9.60E-07	2.04E-07	3.00E-09	3.15E-07	5.22E-07	1.73E-03	1.05E-07

Year 2014 - Existing City Only

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2014	1,090,263,590	1	21	310	MTons	
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.07%	0.01%	1.86E+02	1.18E-03	8.72E-01	0	195
LDA	57.57%	67.51%	2.05E+05	6.21E+00	8.00E+01	3	205,897
LDT1	4.59%	5.39%	1.90E+04	1.33E+00	1.63E+01	1	19,177
LDT2	19.41%	22.76%	9.41E+04	2.75E+00	4.65E+01	1	94,627
LHD1	2.04%	0.42%	2.83E+03	8.89E-02	9.31E+00	0	2,927
LHD2	0.48%	0.10%	6.84E+02	1.24E-02	2.67E+00	0	711
MCY	0.55%	0.65%	1.02E+03	2.39E+00	7.57E+00	0	1,145
MDV	11.71%	2.42%	1.28E+04	4.92E-01	7.86E+00	0	12,920
MH	0.10%	0.02%	2.44E+02	1.39E-02	4.44E-01	0	249
Motor Coach	0.03%	0.01%	1.15E+02	8.24E-04	5.80E-01	0	121
OBUS	0.09%	0.02%	2.20E+02	5.34E-03	1.16E-01	0	221
SBUS	0.06%	0.01%	1.20E+02	4.20E-03	7.82E-01	0	128
T6 Ag	0.01%	0.00%	1.42E+01	4.90E-04	1.40E-01	0	16
T6 CAIRP Heavy	0.00%	0.00%	4.11E+00	2.37E-05	1.38E-02	0	4
T6 CAIRP Small	0.00%	0.00%	1.27E+01	1.22E-04	4.91E-02	0	13
T6 Instate Construction Heavy	0.05%	0.01%	1.16E+02	1.28E-03	6.92E-01	0	123
T6 Instate Construction Small	0.11%	0.02%	2.73E+02	3.07E-03	1.25E+00	0	285
T6 Instate Heavy	0.27%	0.06%	6.87E+02	6.31E-03	3.02E+00	0	717
T6 Instate Small	0.64%	0.13%	1.64E+03	2.33E-02	9.15E+00	0	1,729
T6 OOS Heavy	0.00%	0.00%	2.37E+00	9.56E-06	7.19E-03	0	2
T6 OOS Small	0.00%	0.00%	7.27E+00	7.01E-05	2.82E-02	0	8
T6 Public	0.03%	0.01%	6.98E+01	1.37E-04	3.95E-01	0	74
T6 Utility	0.00%	0.00%	1.29E+01	1.85E-05	2.46E-02	0	13
T6TS	0.14%	0.03%	3.67E+02	2.90E-02	5.26E-01	0	373
T7 Ag	0.00%	0.00%	1.87E+01	7.10E-04	1.88E-01	0	21
T7 CAIRP	0.28%	0.06%	1.06E+03	7.37E-03	4.16E+00	0	1,105
T7 CAIRP Construction	0.03%	0.01%	1.25E+02	1.11E-03	6.19E-01	0	131
T7 NNOOS	0.35%	0.07%	1.28E+03	4.03E-03	3.00E+00	0	1,314
T7 NOOS	0.11%	0.02%	4.20E+02	2.18E-03	1.54E+00	0	435
T7 Other Port	0.06%	0.01%	2.46E+02	1.05E-03	7.56E-01	0	254
T7 POAK	0.11%	0.02%	4.39E+02	1.95E-03	1.41E+00	0	453
T7 Public	0.03%	0.01%	1.10E+02	2.89E-04	8.00E-01	0	118
T7 Single	0.17%	0.03%	6.52E+02	8.63E-03	4.32E+00	0	695
T7 Single Construction	0.08%	0.02%	3.19E+02	2.94E-03	1.78E+00	0	337
T7 SWCV	0.05%	0.01%	4.22E+02	5.76E-02	1.10E+00	0	434
T7 Tractor	0.51%	0.11%	1.96E+03	1.95E-02	9.86E+00	0	2,058
T7 Tractor Construction	0.06%	0.01%	2.39E+02	3.20E-03	1.44E+00	0	253
T7 Utility	0.00%	0.00%	1.10E+01	2.17E-05	2.92E-02	0	11
T7IS	0.02%	0.00%	7.72E+01	1.38E-02	2.05E-01	0	79
UBUS	0.18%	0.04%	7.00E+02	4.25E-02	6.89E+00	0	769
TOTAL	100%	100%	347,624	14	226	7	350,140

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x. (N₂O = 0.0167 + 0.0318 x NO_x)

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Year 2014 - Existing City + SOI

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP		SAR GWP	
	2014	1,228,893,560	1	21		310	MTons
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.07%	0.01%	2.10E+02	1.33E-03	9.83E-01	0	220
LDA	57.57%	67.51%	2.31E+05	7.00E+00	9.01E+01	3	232,078
LDT1	4.59%	5.39%	2.14E+04	1.50E+00	1.84E+01	1	21,615
LDT2	19.41%	22.76%	1.06E+05	3.10E+00	5.24E+01	2	106,659
LHD1	2.04%	0.42%	3.19E+03	1.00E-01	1.05E+01	0	3,299
LHD2	0.48%	0.10%	7.71E+02	1.40E-02	3.01E+00	0	801
MCY	0.55%	0.65%	1.15E+03	2.69E+00	8.53E+00	0	1,291
MDV	11.71%	2.42%	1.45E+04	5.55E-01	8.86E+00	0	14,563
MH	0.10%	0.02%	2.76E+02	1.57E-02	5.00E-01	0	281
Motor Coach	0.03%	0.01%	1.29E+02	9.29E-04	6.54E-01	0	136
OBUS	0.09%	0.02%	2.48E+02	6.01E-03	1.31E-01	0	249
SBUS	0.06%	0.01%	1.35E+02	4.74E-03	8.81E-01	0	144
T6 Ag	0.01%	0.00%	1.60E+01	5.52E-04	1.57E-01	0	18
T6 CAIRP Heavy	0.00%	0.00%	4.63E+00	2.67E-05	1.56E-02	0	5
T6 CAIRP Small	0.00%	0.00%	1.43E+01	1.38E-04	5.54E-02	0	15
T6 Instate Construction Heavy	0.05%	0.01%	1.31E+02	1.44E-03	7.80E-01	0	138
T6 Instate Construction Small	0.11%	0.02%	3.07E+02	3.46E-03	1.41E+00	0	321
T6 Instate Heavy	0.27%	0.06%	7.74E+02	7.12E-03	3.40E+00	0	808
T6 Instate Small	0.64%	0.13%	1.85E+03	2.62E-02	1.03E+01	0	1,948
T6 OOS Heavy	0.00%	0.00%	2.67E+00	1.08E-05	8.10E-03	0	3
T6 OOS Small	0.00%	0.00%	8.20E+00	7.90E-05	3.17E-02	0	9
T6 Public	0.03%	0.01%	7.87E+01	1.55E-04	4.45E-01	0	83
T6 Utility	0.00%	0.00%	1.45E+01	2.08E-05	2.78E-02	0	15
T6TS	0.14%	0.03%	4.13E+02	3.26E-02	5.92E-01	0	420
T7 Ag	0.00%	0.00%	2.11E+01	8.00E-04	2.12E-01	0	23
T7 CAIRP	0.28%	0.06%	1.20E+03	8.30E-03	4.69E+00	0	1,245
T7 CAIRP Construction	0.03%	0.01%	1.41E+02	1.26E-03	6.98E-01	0	148
T7 NNOOS	0.35%	0.07%	1.45E+03	4.54E-03	3.38E+00	0	1,481
T7 NOOS	0.11%	0.02%	4.74E+02	2.46E-03	1.73E+00	0	491
T7 Other Port	0.06%	0.01%	2.78E+02	1.18E-03	8.52E-01	0	286
T7 POAK	0.11%	0.02%	4.94E+02	2.19E-03	1.59E+00	0	510
T7 Public	0.03%	0.01%	1.24E+02	3.26E-04	9.02E-01	0	133
T7 Single	0.17%	0.03%	7.35E+02	9.73E-03	4.87E+00	0	783
T7 Single Construction	0.08%	0.02%	3.60E+02	3.31E-03	2.00E+00	0	379
T7 SWCV	0.05%	0.01%	4.76E+02	6.50E-02	1.24E+00	0	489
T7 Tractor	0.51%	0.11%	2.21E+03	2.20E-02	1.11E+01	0	2,320
T7 Tractor Construction	0.06%	0.01%	2.69E+02	3.61E-03	1.62E+00	0	285
T7 Utility	0.00%	0.00%	1.24E+01	2.44E-05	3.29E-02	0	13
T7IS	0.02%	0.00%	8.70E+01	1.55E-02	2.31E-01	0	90
UBUS	0.18%	0.04%	7.89E+02	4.79E-02	7.76E+00	0	867
TOTAL	100%	100%	391,826	15	255	8	394,661

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x)

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Santa Clara County 2020 - all Model
Years (40 MPH)

g/mile

Veh	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUN				CO2_RUNEX	CH4_RUNEX	VMT from default EMFAC-SG	%VMT
									EX	PM2.5_PMTW	PM2.5_PMBW	PM2_5_Total				
All Other Buses	6.51E-02	2.86E+00	2.23E-01	1.12E-02	1.62E-02	1.20E-02	1.30E-01	1.59E-01	1.55E-02	3.00E-03	5.59E-02	7.44E-02	1.17E+03	3.02E-03	37,997	0.08%
LDA	9.66E-03	5.05E-02	6.08E-01	2.33E-03	1.47E-03	8.00E-03	3.68E-02	4.62E-02	1.36E-03	2.00E-03	1.58E-02	1.91E-02	2.33E+02	3.83E-03	28,535,430	60.48%
LDT1	2.43E-02	1.20E-01	1.32E+00	2.85E-03	2.17E-03	8.00E-03	3.67E-02	4.69E-02	2.00E-03	2.00E-03	1.57E-02	1.98E-02	2.84E+02	9.70E-03	1,802,512	3.82%
LDT2	1.36E-02	8.33E-02	8.27E-01	3.25E-03	1.39E-03	8.00E-03	3.67E-02	4.61E-02	1.28E-03	2.00E-03	1.58E-02	1.90E-02	3.25E+02	5.47E-03	8,735,504	18.51%
LHD1	6.41E-02	1.38E+00	8.62E-01	5.66E-03	1.01E-02	9.90E-03	7.64E-02	9.64E-02	9.60E-03	2.47E-03	3.28E-02	4.48E-02	5.76E+02	1.12E-02	731,189	1.55%
LHD2	4.72E-02	1.06E+00	3.83E-01	5.69E-03	1.05E-02	1.07E-02	8.92E-02	1.10E-01	1.00E-02	2.67E-03	3.82E-02	5.09E-02	5.84E+02	4.44E-03	234,988	0.50%
MCY	1.97E+00	1.03E+00	1.76E+01	1.84E-03	1.62E-03	4.00E-03	1.18E-02	1.74E-02	1.52E-03	1.00E-03	5.04E-03	7.56E-03	1.50E+02	3.76E-01	253,032	0.54%
MDV	3.23E-02	1.63E-01	1.42E+00	4.30E-03	1.64E-03	8.00E-03	3.67E-02	4.64E-02	1.52E-03	2.00E-03	1.57E-02	1.93E-02	4.29E+02	1.09E-02	5,119,735	10.85%
MH	1.01E-01	1.34E+00	2.86E+00	1.07E-02	2.11E-02	1.28E-02	1.30E-01	1.64E-01	2.01E-02	3.21E-03	5.59E-02	7.92E-02	1.07E+03	3.19E-02	37,035	0.08%
Motor Coach	1.29E-01	4.08E+00	5.04E-01	1.61E-02	2.26E-02	1.20E-02	1.30E-01	1.65E-01	2.16E-02	3.00E-03	5.59E-02	8.05E-02	1.69E+03	6.00E-03	15,952	0.03%
OBUS	2.76E-02	2.47E-01	8.91E-01	1.08E-02	6.70E-04	1.20E-02	1.30E-01	1.43E-01	6.16E-04	3.00E-03	5.59E-02	5.95E-02	1.08E+03	1.12E-02	44,318	0.09%
SBUS	6.65E-02	3.84E+00	1.09E+00	8.85E-03	1.75E-02	1.06E-02	7.45E-01	7.73E-01	1.67E-02	2.65E-03	3.19E-01	3.39E-01	9.18E+02	1.28E-02	29,230	0.06%
T6 Ag	3.90E-01	5.10E+00	1.31E+00	1.12E-02	2.41E-01	1.20E-02	1.30E-01	3.83E-01	2.30E-01	3.00E-03	5.59E-02	2.89E-01	1.18E+03	1.81E-02	2,417	0.01%
T6 CAIRP Heavy	3.90E-02	1.23E+00	1.70E-01	1.08E-02	6.65E-03	1.20E-02	1.30E-01	1.49E-01	6.36E-03	3.00E-03	5.59E-02	6.52E-02	1.13E+03	1.81E-03	879	0.00%
T6 CAIRP Small	6.20E-02	1.01E+00	2.39E-01	1.08E-02	3.02E-02	1.20E-02	1.30E-01	1.73E-01	2.89E-02	3.00E-03	5.59E-02	8.78E-02	1.13E+03	2.88E-03	2,699	0.01%
T6 Instate Construction Heavy	5.71E-02	2.66E+00	2.03E-01	1.10E-02	1.56E-02	1.20E-02	1.30E-01	1.58E-01	1.50E-02	3.00E-03	5.59E-02	7.38E-02	1.16E+03	2.65E-03	10,752	0.02%
T6 Instate Construction Small	9.16E-02	1.61E+00	3.26E-01	1.09E-02	5.09E-02	1.20E-02	1.30E-01	1.93E-01	4.87E-02	3.00E-03	5.59E-02	1.08E-01	1.14E+03	4.25E-03	25,192	0.05%
T6 Instate Heavy	5.70E-02	2.25E+00	2.10E-01	1.10E-02	1.21E-02	1.20E-02	1.30E-01	1.54E-01	1.16E-02	3.00E-03	5.59E-02	7.05E-02	1.15E+03	2.65E-03	129,403	0.27%
T6 Instate Small	1.00E-01	1.69E+00	3.54E-01	1.09E-02	5.84E-02	1.20E-02	1.30E-01	2.01E-01	5.58E-02	3.00E-03	5.59E-02	1.15E-01	1.15E+03	4.66E-03	316,000	0.67%
T6 OOS Heavy	3.93E-02	1.30E+00	1.71E-01	1.08E-02	7.09E-03	1.20E-02	1.30E-01	1.49E-01	6.78E-03	3.00E-03	5.59E-02	6.56E-02	1.13E+03	1.82E-03	504	0.00%
T6 OOS Small	6.20E-02	1.01E+00	2.39E-01	1.08E-02	3.02E-02	1.20E-02	1.30E-01	1.73E-01	2.89E-02	3.00E-03	5.59E-02	8.78E-02	1.13E+03	2.88E-03	1,546	0.00%
T6 Public	3.80E-02	3.43E+00	1.46E-01	1.09E-02	1.58E-02	1.20E-02	1.30E-01	1.58E-01	1.51E-02	3.00E-03	5.59E-02	7.40E-02	1.14E+03	1.76E-03	12,946	0.03%
T6 Utility	2.21E-02	4.25E-01	1.16E-01	1.12E-02	1.97E-03	1.20E-02	1.30E-01	1.44E-01	1.89E-03	3.00E-03	5.59E-02	6.07E-02	1.17E+03	1.02E-03	2,212	0.00%
T6TS	6.86E-02	5.29E-01	2.25E+00	1.09E-02	9.35E-04	1.20E-02	1.30E-01	1.43E-01	8.60E-04	3.00E-03	5.59E-02	5.97E-02	1.08E+03	2.77E-02	74,243	0.16%
T7 Ag	7.97E-01	9.65E+00	3.94E+00	1.63E-02	5.07E-01	3.60E-02	6.17E-02	6.04E-01	4.85E-01	9.00E-03	2.65E-02	5.20E-01	1.71E+03	3.70E-02	2,061	0.00%
T7 CAIRP	1.19E-01	3.40E+00	5.59E-01	1.51E-02	1.62E-02	3.60E-02	6.17E-02	1.14E-01	1.55E-02	9.00E-03	2.65E-02	5.10E-02	1.58E+03	5.53E-03	154,207	0.33%
T7 CAIRP Construction	1.20E-01	3.48E+00	5.21E-01	1.52E-02	2.01E-02	3.60E-02	6.17E-02	1.18E-01	1.92E-02	9.00E-03	2.65E-02	5.47E-02	1.60E+03	5.56E-03	7,627	0.02%
T7 NNOOS	7.39E-02	1.39E+00	4.02E-01	1.41E-02	7.66E-03	3.60E-02	6.17E-02	1.05E-01	7.33E-03	9.00E-03	2.65E-02	4.28E-02	1.48E+03	3.43E-03	191,217	0.41%
T7 NOOS	1.19E-01	3.46E+00	5.60E-01	1.51E-02	1.65E-02	3.60E-02	6.17E-02	1.14E-01	1.58E-02	9.00E-03	2.65E-02	5.13E-02	1.58E+03	5.51E-03	60,912	0.13%
T7 Other Port	1.54E-01	4.56E+00	5.85E-01	1.59E-02	2.31E-02	3.60E-02	6.17E-02	1.21E-01	2.21E-02	9.00E-03	2.65E-02	5.75E-02	1.66E+03	7.17E-03	32,132	0.07%
T7 POAK	1.75E-01	5.35E+00	6.28E-01	1.61E-02	2.73E-02	3.60E-02	6.17E-02	1.25E-01	2.61E-02	9.00E-03	2.65E-02	6.16E-02	1.69E+03	8.11E-03	65,000	0.14%
T7 Public	9.21E-02	9.76E+00	4.06E-01	1.63E-02	4.77E-02	3.60E-02	6.17E-02	1.45E-01	4.56E-02	9.00E-03	2.65E-02	8.11E-02	1.71E+03	4.28E-03	11,047	0.02%
T7 Single	1.08E-01	4.75E+00	4.31E-01	1.60E-02	2.25E-02	3.60E-02	6.17E-02	1.20E-01	2.16E-02	9.00E-03	2.65E-02	5.70E-02	1.68E+03	5.02E-03	76,013	0.16%
T7 Single Construction	9.19E-02	3.63E+00	3.91E-01	1.55E-02	1.75E-02	3.60E-02	6.17E-02	1.15E-01	1.67E-02	9.00E-03	2.65E-02	5.22E-02	1.62E+03	4.27E-03	19,730	0.04%
T7 SWCV	4.85E-02	6.59E+00	2.20E+00	2.10E-02	7.65E-03	3.60E-02	6.17E-02	1.05E-01	7.32E-03	9.00E-03	2.65E-02	4.28E-02	3.35E+03	7.58E-01	21,399	0.05%
T7 Tractor	1.41E-01	4.48E+00	5.77E-01	1.53E-02	2.29E-02	3.60E-02	6.17E-02	1.21E-01	2.19E-02	9.00E-03	2.65E-02	5.74E-02	1.61E+03	6.55E-03	284,221	0.60%
T7 Tractor Construction	1.36E-01	4.71E+00	5.48E-01	1.56E-02	2.72E-02	3.60E-02	6.17E-02	1.25E-01	2.61E-02	9.00E-03	2.65E-02	6.15E-02	1.63E+03	6.32E-03	14,710	0.03%
T7 Utility	4.49E-02	7.59E-01	2.65E-01	1.55E-02	3.02E-03	3.60E-02	6.17E-02	1.01E-01	2.89E-03	9.00E-03	2.65E-02	3.84E-02	1.62E+03	2.08E-03	1,303	0.00%
T7IS	3.75E-01	2.92E+00	2.92E+01	1.71E-02	6.98E-04	2.00E-02	6.17E-02	8.24E-02	6.42E-04	5.00E-03	2.65E-02	3.21E-02	1.67E+03	1.51E-01	9,389	0.02%
UBUS	2.74E-01	9.71E+00	2.76E+00	1.39E-02	1.21E-01	1.20E-02	6.33E-01	7.67E-01	1.16E-01	3.00E-03	2.71E-01	3.91E-01	1.55E+03	8.70E-02	74,139	0.16%
															47,180,821	100.00%

EMFAC2014v1.0.7 based on the average annual temperature and humidity for Palo Alto from USA.com (<http://www.usa.com/palo-alto-ca-weather.htm>) accessed March 31, 2014. Assumes an average 40 mph speed based on CalEEMod Users' Manual.

Air Quality & Greenhouse Gas Modeling

City + SOI

Santa Clara County 2020 - all Model Years (40 MPH)		lbs/Mile													
##															
Veh		ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUN					CH4_RUNEX
										EX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_Total	CO2_RUNEX	
All Other Buses		1.44E-04	6.30E-03	4.92E-04	2.46E-05	3.58E-05	2.65E-05	2.87E-04	3.50E-04	3.42E-05	6.61E-06	1.23E-04	1.64E-04	2.58E+00	6.67E-06
LDA		2.13E-05	1.11E-04	1.34E-03	5.14E-06	3.25E-06	1.76E-05	8.10E-05	1.02E-04	3.00E-06	4.41E-06	3.47E-05	4.21E-05	5.14E-01	8.44E-06
LDT1		5.36E-05	2.66E-04	2.90E-03	6.29E-06	4.79E-06	1.76E-05	8.10E-05	1.03E-04	4.41E-06	4.41E-06	3.47E-05	4.35E-05	6.25E-01	2.14E-05
LDT2		3.00E-05	1.84E-04	1.82E-03	7.18E-06	3.07E-06	1.76E-05	8.10E-05	1.02E-04	2.83E-06	4.41E-06	3.47E-05	4.20E-05	7.16E-01	1.21E-05
LHD1		1.41E-04	3.04E-03	1.90E-03	1.25E-05	2.22E-05	2.18E-05	1.69E-04	2.13E-04	2.12E-05	5.45E-06	7.22E-05	9.88E-05	1.27E+00	2.48E-05
LHD2		1.04E-04	2.34E-03	8.45E-04	1.25E-05	2.32E-05	2.36E-05	1.97E-04	2.43E-04	2.21E-05	5.90E-06	8.43E-05	1.12E-04	1.29E+00	9.78E-06
MCY		4.33E-03	2.28E-03	3.88E-02	4.06E-06	3.57E-06	8.82E-06	2.59E-05	3.83E-05	3.34E-06	2.20E-06	1.11E-05	1.67E-05	3.30E-01	8.30E-04
MDV		7.13E-05	3.59E-04	3.14E-03	9.47E-06	3.62E-06	1.76E-05	8.10E-05	1.02E-04	3.34E-06	4.41E-06	3.47E-05	4.25E-05	9.45E-01	2.40E-05
MH		2.23E-04	2.96E-03	6.30E-03	2.35E-05	4.65E-05	2.83E-05	2.87E-04	3.62E-04	4.44E-05	7.08E-06	1.23E-04	1.75E-04	2.37E+00	7.04E-05
Motor Coach		2.85E-04	9.00E-03	1.11E-03	3.55E-05	4.98E-05	2.65E-05	2.87E-04	3.64E-04	4.77E-05	6.61E-06	1.23E-04	1.77E-04	3.73E+00	1.32E-05
OBUS		6.09E-05	5.44E-04	1.96E-03	2.39E-05	1.48E-06	2.65E-05	2.87E-04	3.15E-04	1.36E-06	6.61E-06	1.23E-04	1.31E-04	2.39E+00	2.46E-05
SBUS		1.47E-04	8.47E-03	2.40E-03	1.95E-05	3.85E-05	2.34E-05	1.64E-03	1.70E-03	3.68E-05	5.84E-06	7.04E-04	7.46E-04	2.02E+00	2.81E-05
T6 Ag		8.59E-04	1.13E-02	2.90E-03	2.48E-05	5.31E-04	2.65E-05	2.87E-04	8.44E-04	5.08E-04	6.61E-06	1.23E-04	6.37E-04	2.60E+00	3.99E-05
T6 CAIRP Heavy		8.59E-05	2.71E-03	3.74E-04	2.37E-05	1.47E-05	2.65E-05	2.87E-04	3.28E-04	1.40E-05	6.61E-06	1.23E-04	1.44E-04	2.49E+00	3.99E-06
T6 CAIRP Small		1.37E-04	2.23E-03	5.27E-04	2.38E-05	6.66E-05	2.65E-05	2.87E-04	3.80E-04	6.37E-05	6.61E-06	1.23E-04	1.94E-04	2.50E+00	6.35E-06
T6 Instate Construction Heavy		1.26E-04	5.86E-03	4.48E-04	2.43E-05	3.45E-05	2.65E-05	2.87E-04	3.48E-04	3.30E-05	6.61E-06	1.23E-04	1.63E-04	2.55E+00	5.85E-06
T6 Instate Construction Small		2.02E-04	3.55E-03	7.19E-04	2.41E-05	1.12E-04	2.65E-05	2.87E-04	4.26E-04	1.07E-04	6.61E-06	1.23E-04	2.37E-04	2.52E+00	9.38E-06
T6 Instate Heavy		1.26E-04	4.97E-03	4.64E-04	2.41E-05	2.68E-05	2.65E-05	2.87E-04	3.41E-04	2.56E-05	6.61E-06	1.23E-04	1.55E-04	2.53E+00	5.84E-06
T6 Instate Small		2.21E-04	3.72E-03	7.81E-04	2.41E-05	1.29E-04	2.65E-05	2.87E-04	4.42E-04	1.23E-04	6.61E-06	1.23E-04	2.53E-04	2.53E+00	1.03E-05
T6 OOS Heavy		8.66E-05	2.86E-03	3.77E-04	2.37E-05	1.56E-05	2.65E-05	2.87E-04	3.29E-04	1.50E-05	6.61E-06	1.23E-04	1.45E-04	2.49E+00	4.02E-06
T6 OOS Small		1.37E-04	2.23E-03	5.27E-04	2.38E-05	6.66E-05	2.65E-05	2.87E-04	3.80E-04	6.37E-05	6.61E-06	1.23E-04	1.94E-04	2.50E+00	6.35E-06
T6 Public		8.37E-05	7.57E-03	3.21E-04	2.40E-05	3.48E-05	2.65E-05	2.87E-04	3.49E-04	3.33E-05	6.61E-06	1.23E-04	1.63E-04	2.52E+00	3.89E-06
T6 Utility		4.86E-05	9.37E-04	2.56E-04	2.46E-05	4.35E-06	2.65E-05	2.87E-04	3.18E-04	4.16E-06	6.61E-06	1.23E-04	1.34E-04	2.58E+00	2.26E-06
T6TS		1.51E-04	1.17E-03	4.95E-03	2.39E-05	2.06E-06	2.65E-05	2.87E-04	3.16E-04	1.90E-06	6.61E-06	1.23E-04	1.32E-04	2.39E+00	6.11E-05
T7 Ag		1.76E-03	2.13E-02	8.68E-03	3.60E-05	1.12E-03	7.94E-05	1.36E-04	1.33E-03	1.07E-03	1.98E-05	5.83E-05	1.15E-03	3.78E+00	8.17E-05
T7 CAIRP		2.62E-04	7.50E-03	1.23E-03	3.32E-05	3.57E-05	7.94E-05	1.36E-04	2.51E-04	3.42E-05	1.98E-05	5.83E-05	1.12E-04	3.48E+00	1.22E-05
T7 CAIRP Construction		2.64E-04	7.68E-03	1.15E-03	3.36E-05	4.43E-05	7.94E-05	1.36E-04	2.60E-04	4.24E-05	1.98E-05	5.83E-05	1.21E-04	3.52E+00	1.23E-05
T7 NNOOS		1.63E-04	3.07E-03	8.87E-04	3.10E-05	1.69E-05	7.94E-05	1.36E-04	2.32E-04	1.62E-05	1.98E-05	5.83E-05	9.43E-05	3.25E+00	7.56E-06
T7 NOOS		2.62E-04	7.64E-03	1.23E-03	3.33E-05	3.64E-05	7.94E-05	1.36E-04	2.52E-04	3.48E-05	1.98E-05	5.83E-05	1.13E-04	3.49E+00	1.21E-05
T7 Other Port		3.40E-04	1.01E-02	1.29E-03	3.50E-05	5.08E-05	7.94E-05	1.36E-04	2.66E-04	4.86E-05	1.98E-05	5.83E-05	1.27E-04	3.67E+00	1.58E-05
T7 POAK		3.85E-04	1.18E-02	1.39E-03	3.56E-05	6.02E-05	7.94E-05	1.36E-04	2.76E-04	5.76E-05	1.98E-05	5.83E-05	1.36E-04	3.73E+00	1.79E-05
T7 Public		2.03E-04	2.15E-02	8.96E-04	3.59E-05	1.05E-04	7.94E-05	1.36E-04	3.21E-04	1.01E-04	1.98E-05	5.83E-05	1.79E-04	3.76E+00	9.44E-06
T7 Single		2.38E-04	1.05E-02	9.50E-04	3.53E-05	4.97E-05	7.94E-05	1.36E-04	2.65E-04	4.75E-05	1.98E-05	5.83E-05	1.26E-04	3.70E+00	1.11E-05
T7 Single Construction		2.03E-04	8.00E-03	8.61E-04	3.41E-05	3.86E-05	7.94E-05	1.36E-04	2.54E-04	3.69E-05	1.98E-05	5.83E-05	1.15E-04	3.58E+00	9.41E-06
T7 SWCV		1.07E-04	1.45E-02	4.84E-03	4.62E-05	1.69E-05	7.94E-05	1.36E-04	2.32E-04	1.61E-05	1.98E-05	5.83E-05	9.43E-05	7.38E+00	1.67E-03
T7 Tractor		3.11E-04	9.89E-03	1.27E-03	3.38E-05	5.06E-05	7.94E-05	1.36E-04	2.66E-04	4.84E-05	1.98E-05	5.83E-05	1.27E-04	3.54E+00	1.45E-05
T7 Tractor Construction		3.00E-04	1.04E-02	1.21E-03	3.44E-05	6.00E-05	7.94E-05	1.36E-04	2.76E-04	5.74E-05	1.98E-05	5.83E-05	1.36E-04	3.60E+00	1.39E-05
T7 Utility		9.90E-05	1.67E-03	5.84E-04	3.41E-05	6.66E-06	7.94E-05	1.36E-04	2.22E-04	6.37E-06	1.98E-05	5.83E-05	8.45E-05	3.57E+00	4.60E-06
T7IS		8.28E-04	6.43E-03	6.44E-02	3.78E-05	1.54E-06	4.41E-05	1.36E-04	1.82E-04	1.42E-06	1.10E-05	5.83E-05	7.08E-05	3.68E+00	3.32E-04
UBUS		6.05E-04	2.14E-02	6.07E-03	3.07E-05	2.67E-04	2.65E-05	1.40E-03	1.69E-03	2.56E-04	6.61E-06	5.99E-04	8.61E-04	3.42E+00	1.92E-04

Santa Clara County 2020 - all Model
Years (40 MPH)

##

MTons/Mile

Veh	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUN				CO2_RUNEX	CH4_RUNEX
									EX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_Total		
All Other Buses	6.51E-08	2.86E-06	2.23E-07	1.12E-08	1.62E-08	1.20E-08	1.30E-07	1.59E-07	1.55E-08	3.00E-09	5.59E-08	7.44E-08	1.17E-03	3.02E-09
LDA	9.66E-09	5.05E-08	6.08E-07	2.33E-09	1.47E-09	8.00E-09	3.68E-08	4.62E-08	1.36E-09	2.00E-09	1.58E-08	1.91E-08	2.33E-04	3.83E-09
LDT1	2.43E-08	1.20E-07	1.32E-06	2.85E-09	2.17E-09	8.00E-09	3.67E-08	4.69E-08	2.00E-09	2.00E-09	1.57E-08	1.98E-08	2.84E-04	9.70E-09
LDT2	1.36E-08	8.33E-08	8.27E-07	3.25E-09	1.39E-09	8.00E-09	3.67E-08	4.61E-08	1.28E-09	2.00E-09	1.58E-08	1.90E-08	3.25E-04	5.47E-09
LHD1	6.41E-08	1.38E-06	8.62E-07	5.66E-09	1.01E-08	9.90E-09	7.64E-08	9.64E-08	9.60E-09	2.47E-09	3.28E-08	4.48E-08	5.76E-04	1.12E-08
LHD2	4.72E-08	1.06E-06	3.83E-07	5.69E-09	1.05E-08	1.07E-08	8.92E-08	1.10E-07	1.00E-08	2.67E-09	3.82E-08	5.09E-08	5.84E-04	4.44E-09
MCY	1.97E-06	1.03E-06	1.76E-05	1.84E-09	1.62E-09	4.00E-09	1.18E-08	1.74E-08	1.52E-09	1.00E-09	5.04E-09	7.56E-09	1.50E-04	3.76E-07
MDV	3.23E-08	1.63E-07	1.42E-06	4.30E-09	1.64E-09	8.00E-09	3.67E-08	4.64E-08	1.52E-09	2.00E-09	1.57E-08	1.93E-08	4.29E-04	1.09E-08
MH	1.01E-07	1.34E-06	2.86E-06	1.07E-08	2.11E-08	1.28E-08	1.30E-07	1.64E-07	2.01E-08	3.21E-09	5.59E-08	7.92E-08	1.07E-03	3.19E-08
Motor Coach	1.29E-07	4.08E-06	5.04E-07	1.61E-08	2.26E-08	1.20E-08	1.30E-07	1.65E-07	2.16E-08	3.00E-09	5.59E-08	8.05E-08	1.69E-03	6.00E-09
OBUS	2.76E-08	2.47E-07	8.91E-07	1.08E-08	6.70E-10	1.20E-08	1.30E-07	1.43E-07	6.16E-10	3.00E-09	5.59E-08	5.95E-08	1.08E-03	1.12E-08
SBUS	6.65E-08	3.84E-06	1.09E-06	8.85E-09	1.75E-08	1.06E-08	7.45E-07	7.73E-07	1.67E-08	2.65E-09	3.19E-07	3.39E-07	9.18E-04	1.28E-08
T6 Ag	3.90E-07	5.10E-06	1.31E-06	1.12E-08	2.41E-07	1.20E-08	1.30E-07	3.83E-07	2.30E-07	3.00E-09	5.59E-08	2.89E-07	1.18E-03	1.81E-08
T6 CAIRP Heavy	3.90E-08	1.23E-06	1.70E-07	1.08E-08	6.65E-09	1.20E-08	1.30E-07	1.49E-07	6.36E-09	3.00E-09	5.59E-08	6.52E-08	1.13E-03	1.81E-09
T6 CAIRP Small	6.20E-08	1.01E-06	2.39E-07	1.08E-08	3.02E-08	1.20E-08	1.30E-07	1.73E-07	2.89E-08	3.00E-09	5.59E-08	8.78E-08	1.13E-03	2.88E-09
T6 Instate Construction Heavy	5.71E-08	2.66E-06	2.03E-07	1.10E-08	1.56E-08	1.20E-08	1.30E-07	1.58E-07	1.50E-08	3.00E-09	5.59E-08	7.38E-08	1.16E-03	2.65E-09
T6 Instate Construction Small	9.16E-08	1.61E-06	3.26E-07	1.09E-08	5.09E-08	1.20E-08	1.30E-07	1.93E-07	4.87E-08	3.00E-09	5.59E-08	1.08E-07	1.14E-03	4.25E-09
T6 Instate Heavy	5.70E-08	2.25E-06	2.10E-07	1.10E-08	1.21E-08	1.20E-08	1.30E-07	1.54E-07	1.16E-08	3.00E-09	5.59E-08	7.05E-08	1.15E-03	2.65E-09
T6 Instate Small	1.00E-07	1.69E-06	3.54E-07	1.09E-08	5.84E-08	1.20E-08	1.30E-07	2.01E-07	5.58E-08	3.00E-09	5.59E-08	1.15E-07	1.15E-03	4.66E-09
T6 OOS Heavy	3.93E-08	1.30E-06	1.71E-07	1.08E-08	7.09E-09	1.20E-08	1.30E-07	1.49E-07	6.78E-09	3.00E-09	5.59E-08	6.56E-08	1.13E-03	1.82E-09
T6 OOS Small	6.20E-08	1.01E-06	2.39E-07	1.08E-08	3.02E-08	1.20E-08	1.30E-07	1.73E-07	2.89E-08	3.00E-09	5.59E-08	8.78E-08	1.13E-03	2.88E-09
T6 Public	3.80E-08	3.43E-06	1.46E-07	1.09E-08	1.58E-08	1.20E-08	1.30E-07	1.58E-07	1.51E-08	3.00E-09	5.59E-08	7.40E-08	1.14E-03	1.76E-09
T6 Utility	2.21E-08	4.25E-07	1.16E-07	1.12E-08	1.97E-09	1.20E-08	1.30E-07	1.44E-07	1.89E-09	3.00E-09	5.59E-08	6.07E-08	1.17E-03	1.02E-09
T6TS	6.86E-08	5.29E-07	2.25E-06	1.09E-08	9.35E-10	1.20E-08	1.30E-07	1.43E-07	8.60E-10	3.00E-09	5.59E-08	5.97E-08	1.08E-03	2.77E-08
T7 Ag	7.97E-07	9.65E-06	3.94E-06	1.63E-08	5.07E-07	3.60E-08	6.17E-08	6.04E-07	4.85E-07	9.00E-09	2.65E-08	5.20E-07	1.71E-03	3.70E-08
T7 CAIRP	1.19E-07	3.40E-06	5.59E-07	1.51E-08	1.62E-08	3.60E-08	6.17E-08	1.14E-07	1.55E-08	9.00E-09	2.65E-08	5.10E-08	1.58E-03	5.53E-09
T7 CAIRP Construction	1.20E-07	3.48E-06	5.21E-07	1.52E-08	2.01E-08	3.60E-08	6.17E-08	1.18E-07	1.92E-08	9.00E-09	2.65E-08	5.47E-08	1.60E-03	5.56E-09
T7 NNOOS	7.39E-08	1.39E-06	4.02E-07	1.41E-08	7.66E-09	3.60E-08	6.17E-08	1.05E-07	7.33E-09	9.00E-09	2.65E-08	4.28E-08	1.48E-03	3.43E-09
T7 NOOS	1.19E-07	3.46E-06	5.60E-07	1.51E-08	1.65E-08	3.60E-08	6.17E-08	1.14E-07	1.58E-08	9.00E-09	2.65E-08	5.13E-08	1.58E-03	5.51E-09
T7 Other Port	1.54E-07	4.56E-06	5.85E-07	1.59E-08	2.31E-08	3.60E-08	6.17E-08	1.21E-07	2.21E-08	9.00E-09	2.65E-08	5.75E-08	1.66E-03	7.17E-09
T7 POAK	1.75E-07	5.35E-06	6.28E-07	1.61E-08	2.73E-08	3.60E-08	6.17E-08	1.25E-07	2.61E-08	9.00E-09	2.65E-08	6.16E-08	1.69E-03	8.11E-09
T7 Public	9.21E-08	9.76E-06	4.06E-07	1.63E-08	4.77E-08	3.60E-08	6.17E-08	1.45E-07	4.56E-08	9.00E-09	2.65E-08	8.11E-08	1.71E-03	4.28E-09
T7 Single	1.08E-07	4.75E-06	4.31E-07	1.60E-08	2.25E-08	3.60E-08	6.17E-08	1.20E-07	2.16E-08	9.00E-09	2.65E-08	5.70E-08	1.68E-03	5.02E-09
T7 Single Construction	9.19E-08	3.63E-06	3.91E-07	1.55E-08	1.75E-08	3.60E-08	6.17E-08	1.15E-07	1.67E-08	9.00E-09	2.65E-08	5.22E-08	1.62E-03	4.27E-09
T7 SWCV	4.85E-08	6.59E-06	2.20E-06	2.10E-08	7.65E-09	3.60E-08	6.17E-08	1.05E-07	7.32E-09	9.00E-09	2.65E-08	4.28E-08	3.35E-03	7.58E-07
T7 Tractor	1.41E-07	4.48E-06	5.77E-07	1.53E-08	2.29E-08	3.60E-08	6.17E-08	1.21E-07	2.19E-08	9.00E-09	2.65E-08	5.74E-08	1.61E-03	6.55E-09
T7 Tractor Construction	1.36E-07	4.71E-06	5.48E-07	1.56E-08	2.72E-08	3.60E-08	6.17E-08	1.25E-07	2.61E-08	9.00E-09	2.65E-08	6.15E-08	1.63E-03	6.32E-09
T7 Utility	4.49E-08	7.59E-07	2.65E-07	1.55E-08	3.02E-09	3.60E-08	6.17E-08	1.01E-07	2.89E-09	9.00E-09	2.65E-08	3.84E-08	1.62E-03	2.08E-09
T7IS	3.75E-07	2.92E-06	2.92E-05	1.71E-08	6.98E-10	2.00E-08	6.17E-08	8.24E-08	6.42E-10	5.00E-09	2.65E-08	3.21E-08	1.67E-03	1.51E-07
UBUS	2.74E-07	9.71E-06	2.76E-06	1.39E-08	1.21E-07	1.20E-08	6.33E-07	7.67E-07	1.16E-07	3.00E-09	2.71E-07	3.91E-07	1.55E-03	8.70E-08

AB 32 Year 2020 Estimate

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2020	1,115,473,140	1	21	310	MTons	
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.08%	0.02%	2.34E+02	6.04E-04	5.70E-01	0	239
LDA	60.48%	69.88%	1.82E+05	2.98E+00	3.94E+01	1	182,011
LDT1	3.82%	4.41%	1.40E+04	4.78E-01	5.93E+00	0	14,035
LDT2	18.51%	21.39%	7.75E+04	1.30E+00	1.99E+01	1	77,731
LHD1	1.55%	0.34%	2.21E+03	4.31E-02	5.29E+00	0	2,264
LHD2	0.50%	0.11%	7.21E+02	5.48E-03	1.31E+00	0	734
MCY	0.54%	0.62%	1.03E+03	2.60E+00	7.15E+00	0	1,160
MDV	10.85%	2.41%	1.15E+04	2.92E-01	4.38E+00	0	11,574
MH	0.08%	0.02%	2.09E+02	6.21E-03	2.61E-01	0	211
Motor Coach	0.03%	0.01%	1.42E+02	5.02E-04	3.42E-01	0	145
OBUS	0.09%	0.02%	2.52E+02	2.60E-03	5.74E-02	0	253
SBUS	0.06%	0.01%	1.41E+02	1.96E-03	5.90E-01	0	147
T6 Ag	0.01%	0.00%	1.49E+01	2.30E-04	6.48E-02	0	16
T6 CAIRP Heavy	0.00%	0.00%	5.21E+00	8.36E-06	5.68E-03	0	5
T6 CAIRP Small	0.01%	0.00%	1.61E+01	4.08E-05	1.44E-02	0	16
T6 Instate Construction Heavy	0.02%	0.01%	6.53E+01	1.50E-04	1.50E-01	0	67
T6 Instate Construction Small	0.05%	0.01%	1.51E+02	5.63E-04	2.13E-01	0	154
T6 Instate Heavy	0.27%	0.06%	7.80E+02	1.80E-03	1.53E+00	0	795
T6 Instate Small	0.67%	0.15%	1.90E+03	7.73E-03	2.80E+00	0	1,932
T6 OOS Heavy	0.00%	0.00%	2.99E+00	4.83E-06	3.43E-03	0	3
T6 OOS Small	0.00%	0.00%	9.20E+00	2.34E-05	8.22E-03	0	9
T6 Public	0.03%	0.01%	7.77E+01	1.20E-04	2.33E-01	0	80
T6 Utility	0.00%	0.00%	1.36E+01	1.19E-05	4.94E-03	0	14
T6TS	0.16%	0.03%	4.23E+02	1.08E-02	2.06E-01	0	425
T7 Ag	0.00%	0.00%	1.85E+01	4.01E-04	1.04E-01	0	20
T7 CAIRP	0.33%	0.07%	1.28E+03	4.48E-03	2.76E+00	0	1,307
T7 CAIRP Construction	0.02%	0.00%	6.40E+01	2.23E-04	1.40E-01	0	65
T7 NNOOS	0.41%	0.09%	1.48E+03	3.45E-03	1.40E+00	0	1,495
T7 NOOS	0.13%	0.03%	5.06E+02	1.76E-03	1.11E+00	0	517
T7 Other Port	0.07%	0.02%	2.81E+02	1.21E-03	7.69E-01	0	288
T7 POAK	0.14%	0.03%	5.77E+02	2.77E-03	1.83E+00	0	595
T7 Public	0.02%	0.01%	9.90E+01	2.48E-04	5.66E-01	0	105
T7 Single	0.16%	0.04%	6.70E+02	2.00E-03	1.90E+00	0	688
T7 Single Construction	0.04%	0.01%	1.68E+02	4.42E-04	3.76E-01	0	172
T7 SWCV	0.05%	0.01%	3.76E+02	8.52E-02	7.40E-01	0	385
T7 Tractor	0.60%	0.13%	2.40E+03	9.79E-03	6.69E+00	0	2,464
T7 Tractor Construction	0.03%	0.01%	1.26E+02	4.88E-04	3.64E-01	0	130
T7 Utility	0.00%	0.00%	1.11E+01	1.43E-05	5.20E-03	0	11
T7IS	0.02%	0.00%	8.23E+01	7.43E-03	1.44E-01	0	84
UBUS	0.16%	0.03%	6.05E+02	3.39E-02	3.78E+00	0	643
TOTAL	100%	100%	301,709	8	113	4	302,989

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x).

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Santa Clara County 2030 - all Model
Years (40 MPH)

g/mile

Veh	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	EX	PM2.5_RUN				CO2_RUNEX	CH4_RUNEX	VMT from default	
										PM2.5_PMTW	PM2.5_PMBW	PM2.5_Total	PM2.5_Run			EMFAC-SG	%VMT
All Other Buses	3.23E-02	5.40E-01	1.70E-01	1.08E-02	3.36E-03	1.20E-02	1.30E-01	1.46E-01	3.21E-03	3.00E-03	5.59E-02	6.21E-02	1.13E+03	1.50E-03	1.50E-03	43,708	0.09%
LDA	3.98E-03	2.26E-02	3.34E-01	1.60E-03	9.78E-04	8.00E-03	3.67E-02	4.57E-02	9.00E-04	2.00E-03	1.57E-02	1.86E-02	1.59E+02	1.59E-03	1.59E-03	31,587,682	62.15%
LDT1	7.74E-03	4.24E-02	5.44E-01	2.05E-03	1.24E-03	8.00E-03	3.67E-02	4.60E-02	1.14E-03	2.00E-03	1.57E-02	1.89E-02	2.05E+02	3.12E-03	3.12E-03	1,730,766	3.41%
LDT2	6.23E-03	3.59E-02	4.93E-01	2.33E-03	1.11E-03	8.00E-03	3.67E-02	4.59E-02	1.02E-03	2.00E-03	1.57E-02	1.88E-02	2.32E+02	2.51E-03	2.51E-03	9,154,780	18.01%
LHD1	3.33E-02	4.92E-01	3.10E-01	5.05E-03	6.79E-03	1.04E-02	7.64E-02	9.36E-02	6.48E-03	2.60E-03	3.28E-02	4.18E-02	5.17E+02	3.37E-03	3.37E-03	602,713	1.19%
LHD2	2.62E-02	1.81E-01	1.60E-01	5.26E-03	6.59E-03	1.08E-02	8.92E-02	1.07E-01	6.30E-03	2.71E-03	3.82E-02	4.72E-02	5.42E+02	1.66E-03	1.66E-03	257,157	0.51%
MCY	1.83E+00	1.01E+00	1.58E+01	1.84E-03	1.84E-03	4.00E-03	1.18E-02	1.76E-02	1.72E-03	1.00E-03	5.04E-03	7.76E-03	1.53E+02	3.93E-01	3.93E-01	260,325	0.51%
MDV	1.08E-02	6.23E-02	6.73E-01	3.16E-03	1.19E-03	8.00E-03	3.67E-02	4.59E-02	1.09E-03	2.00E-03	1.58E-02	1.88E-02	3.15E+02	4.31E-03	4.31E-03	5,145,584	10.12%
MH	2.13E-02	6.64E-01	4.04E-01	1.02E-02	9.30E-03	1.29E-02	1.30E-01	1.53E-01	8.87E-03	3.22E-03	5.59E-02	6.79E-02	1.03E+03	5.25E-03	5.25E-03	33,071	0.07%
Motor Coach	6.63E-02	7.86E-01	3.91E-01	1.52E-02	5.26E-03	1.20E-02	1.30E-01	1.48E-01	5.04E-03	3.00E-03	5.59E-02	6.39E-02	1.59E+03	3.08E-03	3.08E-03	19,111	0.04%
OBUS	9.40E-03	9.65E-02	2.62E-01	1.05E-02	8.87E-04	1.20E-02	1.30E-01	1.43E-01	8.16E-04	3.00E-03	5.59E-02	5.97E-02	1.05E+03	3.80E-03	3.80E-03	50,039	0.10%
SBUS	3.23E-02	1.07E+00	3.44E-01	8.37E-03	6.87E-03	1.04E-02	7.45E-01	7.62E-01	6.56E-03	2.59E-03	3.19E-01	3.28E-01	8.67E+02	4.16E-03	4.16E-03	32,840	0.06%
T6 Ag	3.59E-02	8.42E-01	1.89E-01	1.10E-02	3.78E-03	1.20E-02	1.30E-01	1.46E-01	3.62E-03	3.00E-03	5.59E-02	6.25E-02	1.16E+03	1.67E-03	1.67E-03	2,417	0.00%
T6 CAIRP Heavy	2.77E-02	3.71E-01	1.46E-01	1.03E-02	2.75E-03	1.20E-02	1.30E-01	1.45E-01	2.63E-03	3.00E-03	5.59E-02	6.15E-02	1.08E+03	1.29E-03	1.29E-03	1,053	0.00%
T6 CAIRP Small	2.61E-02	3.23E-01	1.37E-01	1.05E-02	2.53E-03	1.20E-02	1.30E-01	1.45E-01	2.43E-03	3.00E-03	5.59E-02	6.13E-02	1.10E+03	1.21E-03	1.21E-03	3,234	0.01%
T6 Instate Construction Heavy	3.19E-02	5.64E-01	1.68E-01	1.07E-02	3.33E-03	1.20E-02	1.30E-01	1.46E-01	3.18E-03	3.00E-03	5.59E-02	6.20E-02	1.13E+03	1.48E-03	1.48E-03	19,235	0.04%
T6 Instate Construction Small	2.87E-02	4.07E-01	1.51E-01	1.06E-02	2.92E-03	1.20E-02	1.30E-01	1.45E-01	2.79E-03	3.00E-03	5.59E-02	6.17E-02	1.11E+03	1.33E-03	1.33E-03	45,068	0.09%
T6 Instate Heavy	3.27E-02	6.12E-01	1.72E-01	1.05E-02	3.39E-03	1.20E-02	1.30E-01	1.46E-01	3.24E-03	3.00E-03	5.59E-02	6.21E-02	1.10E+03	1.52E-03	1.52E-03	137,662	0.27%
T6 Instate Small	2.92E-02	4.23E-01	1.54E-01	1.06E-02	2.96E-03	1.20E-02	1.30E-01	1.45E-01	2.83E-03	3.00E-03	5.59E-02	6.17E-02	1.11E+03	1.36E-03	1.36E-03	348,155	0.69%
T6 OOS Heavy	2.77E-02	3.74E-01	1.46E-01	1.03E-02	2.76E-03	1.20E-02	1.30E-01	1.45E-01	2.64E-03	3.00E-03	5.59E-02	6.15E-02	1.08E+03	1.29E-03	1.29E-03	604	0.00%
T6 OOS Small	2.61E-02	3.23E-01	1.37E-01	1.05E-02	2.53E-03	1.20E-02	1.30E-01	1.45E-01	2.43E-03	3.00E-03	5.59E-02	6.13E-02	1.10E+03	1.21E-03	1.21E-03	1,853	0.00%
T6 Public	2.75E-02	1.02E+00	1.28E-01	1.07E-02	5.39E-03	1.20E-02	1.30E-01	1.48E-01	5.15E-03	3.00E-03	5.59E-02	6.40E-02	1.12E+03	1.28E-03	1.28E-03	14,652	0.03%
T6 Utility	2.17E-02	2.64E-01	1.14E-01	1.06E-02	1.94E-03	1.20E-02	1.30E-01	1.44E-01	1.85E-03	3.00E-03	5.59E-02	6.07E-02	1.11E+03	1.01E-03	1.01E-03	2,443	0.00%
T6TS	1.17E-02	1.17E-01	3.53E-01	1.05E-02	9.02E-04	1.20E-02	1.30E-01	1.43E-01	8.29E-04	3.00E-03	5.59E-02	5.97E-02	1.05E+03	4.74E-03	4.74E-03	89,913	0.18%
T7 Ag	8.46E-02	1.99E+00	5.00E-01	1.55E-02	6.93E-03	3.60E-02	6.17E-02	1.05E-01	6.63E-03	9.00E-03	2.65E-02	4.21E-02	1.62E+03	3.93E-03	3.93E-03	2,061	0.00%
T7 CAIRP	7.00E-02	8.45E-01	4.14E-01	1.36E-02	5.65E-03	3.60E-02	6.17E-02	1.03E-01	5.41E-03	9.00E-03	2.65E-02	4.09E-02	1.43E+03	3.25E-03	3.25E-03	184,747	0.36%
T7 CAIRP Construction	7.07E-02	8.17E-01	4.17E-01	1.40E-02	5.76E-03	3.60E-02	6.17E-02	1.03E-01	5.51E-03	9.00E-03	2.65E-02	4.10E-02	1.46E+03	3.28E-03	3.28E-03	13,645	0.03%
T7 NNOOS	6.03E-02	6.22E-01	3.56E-01	1.35E-02	4.66E-03	3.60E-02	6.17E-02	1.02E-01	4.46E-03	9.00E-03	2.65E-02	3.99E-02	1.42E+03	2.80E-03	2.80E-03	229,086	0.45%
T7 NOOS	7.02E-02	8.51E-01	4.14E-01	1.36E-02	5.67E-03	3.60E-02	6.17E-02	1.03E-01	5.42E-03	9.00E-03	2.65E-02	4.09E-02	1.43E+03	3.26E-03	3.26E-03	72,975	0.14%
T7 Other Port	7.26E-02	8.14E-01	4.28E-01	1.39E-02	5.94E-03	3.60E-02	6.17E-02	1.04E-01	5.68E-03	9.00E-03	2.65E-02	4.11E-02	1.46E+03	3.37E-03	3.37E-03	34,616	0.07%
T7 POAK	7.33E-02	8.31E-01	4.33E-01	1.39E-02	6.01E-03	3.60E-02	6.17E-02	1.04E-01	5.75E-03	9.00E-03	2.65E-02	4.12E-02	1.46E+03	3.40E-03	3.40E-03	108,511	0.21%
T7 Public	7.61E-02	5.13E+00	3.48E-01	1.53E-02	2.41E-02	3.60E-02	6.17E-02	1.22E-01	2.31E-02	9.00E-03	2.65E-02	5.85E-02	1.60E+03	3.54E-03	3.54E-03	9,848	0.02%
T7 Single	6.19E-02	9.71E-01	3.65E-01	1.46E-02	4.74E-03	3.60E-02	6.17E-02	1.02E-01	4.54E-03	9.00E-03	2.65E-02	4.00E-02	1.53E+03	2.87E-03	2.87E-03	67,349	0.13%
T7 Single Construction	5.85E-02	7.98E-01	3.44E-01	1.43E-02	4.55E-03	3.60E-02	6.17E-02	1.02E-01	4.36E-03	9.00E-03	2.65E-02	3.98E-02	1.50E+03	2.72E-03	2.72E-03	35,298	0.07%
T7 SWCV	3.37E-02	2.93E+00	3.97E+00	9.65E-03	4.68E-03	3.60E-02	6.17E-02	1.02E-01	4.48E-03	9.00E-03	2.65E-02	3.99E-02	2.93E+03	1.15E+00	1.15E+00	19,448	0.04%
T7 Tractor	7.42E-02	1.03E+00	4.38E-01	1.38E-02	6.05E-03	3.60E-02	6.17E-02	1.04E-01	5.79E-03	9.00E-03	2.65E-02	4.13E-02	1.45E+03	3.45E-03	3.45E-03	345,440	0.68%
T7 Tractor Construction	7.51E-02	1.05E+00	4.43E-01	1.42E-02	6.21E-03	3.60E-02	6.17E-02	1.04E-01	5.94E-03	9.00E-03	2.65E-02	4.14E-02	1.49E+03	3.49E-03	3.49E-03	26,317	0.05%
T7 Utility	4.52E-02	5.20E-01	2.67E-01	1.43E-02	3.07E-03	3.60E-02	6.17E-02	1.01E-01	2.94E-03	9.00E-03	2.65E-02	3.84E-02	1.50E+03	2.10E-03	2.10E-03	1,439	0.00%
T7IS	2.43E-01	2.60E+00	2.89E+01	1.61E-02	8.92E-04	2.00E-02	6.17E-02	8.26E-02	8.20E-04	5.00E-03	2.65E-02	3.23E-02	1.56E+03	9.83E-02	9.83E-02	12,055	0.02%
UBUS	7.16E-02	3.49E+00	1.15E+00	1.18E-02	4.27E-02	1.20E-02	5.36E-01	5.91E-01	4.09E-02	3.00E-03	2.30E-01	2.74E-01	1.38E+03	5.37E-02	5.37E-02	74,696	0.15%
																50,821,595	100.00%

EMFAC2014v1.0.7 based on the average annual temperature and humidity for Palo Alto from USA.com (<http://www.usa.com/palo-alto-ca-weather.htm>) accessed March 31, 2014. Assumes an average 40 mph speed based on CalEEMod Users' Manual.

Santa Clara County 2030 - all Model
Years (40 MPH)

##

lbs/Mile

Veh	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	PM2.5_RUN		PM2.5_PMTW	PM2.5_PMBW	PM2_5_Total	CO2_RUNEX	CH4_RUNEX
									EX						
All Other Buses	7.12E-05	1.19E-03	3.75E-04	2.37E-05	7.41E-06	2.65E-05	2.87E-04	3.21E-04	7.08E-06	6.61E-06	1.23E-04	1.37E-04	2.49E+00	3.31E-06	
LDA	8.77E-06	4.97E-05	7.37E-04	3.52E-06	2.16E-06	1.76E-05	8.10E-05	1.01E-04	1.98E-06	4.41E-06	3.47E-05	4.11E-05	3.51E-01	3.50E-06	
LDT1	1.71E-05	9.34E-05	1.20E-03	4.53E-06	2.73E-06	1.76E-05	8.10E-05	1.01E-04	2.52E-06	4.41E-06	3.47E-05	4.16E-05	4.52E-01	6.89E-06	
LDT2	1.37E-05	7.93E-05	1.09E-03	5.13E-06	2.45E-06	1.76E-05	8.10E-05	1.01E-04	2.25E-06	4.41E-06	3.47E-05	4.14E-05	5.12E-01	5.53E-06	
LHD1	7.35E-05	1.09E-03	6.82E-04	1.11E-05	1.50E-05	2.30E-05	1.69E-04	2.06E-04	1.43E-05	5.74E-06	7.22E-05	9.23E-05	1.14E+00	7.42E-06	
LHD2	5.77E-05	3.99E-04	3.52E-04	1.16E-05	1.45E-05	2.39E-05	1.97E-04	2.35E-04	1.39E-05	5.97E-06	8.43E-05	1.04E-04	1.19E+00	3.65E-06	
MCY	4.03E-03	2.24E-03	3.49E-02	4.05E-06	4.06E-06	8.82E-06	2.59E-05	3.88E-05	3.79E-06	2.20E-06	1.11E-05	1.71E-05	3.36E-01	8.67E-04	
MDV	2.38E-05	1.37E-04	1.48E-03	6.96E-06	2.62E-06	1.76E-05	8.10E-05	1.01E-04	2.41E-06	4.41E-06	3.47E-05	4.15E-05	6.95E-01	9.50E-06	
MH	4.69E-05	1.46E-03	8.91E-04	2.26E-05	2.05E-05	2.84E-05	2.87E-04	3.36E-04	1.95E-05	7.10E-06	1.23E-04	1.50E-04	2.28E+00	1.16E-05	
Motor Coach	1.46E-04	1.73E-03	8.63E-04	3.35E-05	1.16E-05	2.65E-05	2.87E-04	3.25E-04	1.11E-05	6.61E-06	1.23E-04	1.41E-04	3.52E+00	6.79E-06	
OBUS	2.07E-05	2.13E-04	5.78E-04	2.31E-05	1.96E-06	2.65E-05	2.87E-04	3.16E-04	1.80E-06	6.61E-06	1.23E-04	1.32E-04	2.32E+00	8.37E-06	
SBUS	7.13E-05	2.37E-03	7.58E-04	1.84E-05	1.51E-05	2.28E-05	1.64E-03	1.68E-03	1.45E-05	5.71E-06	7.04E-04	7.24E-04	1.91E+00	9.17E-06	
T6 Ag	7.91E-05	1.86E-03	4.16E-04	2.43E-05	8.33E-06	2.65E-05	2.87E-04	3.22E-04	7.97E-06	6.61E-06	1.23E-04	1.38E-04	2.55E+00	3.67E-06	
T6 CAIRP Heavy	6.10E-05	8.18E-04	3.21E-04	2.27E-05	6.07E-06	2.65E-05	2.87E-04	3.20E-04	5.80E-06	6.61E-06	1.23E-04	1.36E-04	2.37E+00	2.83E-06	
T6 CAIRP Small	5.74E-05	7.12E-04	3.02E-04	2.32E-05	5.59E-06	2.65E-05	2.87E-04	3.19E-04	5.35E-06	6.61E-06	1.23E-04	1.35E-04	2.43E+00	2.67E-06	
T6 Instate Construction Heavy	7.03E-05	1.24E-03	3.69E-04	2.37E-05	7.34E-06	2.65E-05	2.87E-04	3.21E-04	7.02E-06	6.61E-06	1.23E-04	1.37E-04	2.48E+00	3.26E-06	
T6 Instate Construction Small	6.33E-05	8.97E-04	3.33E-04	2.34E-05	6.44E-06	2.65E-05	2.87E-04	3.20E-04	6.16E-06	6.61E-06	1.23E-04	1.36E-04	2.45E+00	2.94E-06	
T6 Instate Heavy	7.20E-05	1.35E-03	3.79E-04	2.31E-05	7.47E-06	2.65E-05	2.87E-04	3.21E-04	7.15E-06	6.61E-06	1.23E-04	1.37E-04	2.42E+00	3.35E-06	
T6 Instate Small	6.44E-05	9.32E-04	3.39E-04	2.34E-05	6.52E-06	2.65E-05	2.87E-04	3.20E-04	6.24E-06	6.61E-06	1.23E-04	1.36E-04	2.46E+00	2.99E-06	
T6 OOS Heavy	6.12E-05	8.24E-04	3.22E-04	2.27E-05	6.08E-06	2.65E-05	2.87E-04	3.20E-04	5.82E-06	6.61E-06	1.23E-04	1.36E-04	2.37E+00	2.84E-06	
T6 OOS Small	5.74E-05	7.12E-04	3.02E-04	2.32E-05	5.59E-06	2.65E-05	2.87E-04	3.19E-04	5.35E-06	6.61E-06	1.23E-04	1.35E-04	2.43E+00	2.67E-06	
T6 Public	6.06E-05	2.24E-03	2.83E-04	2.35E-05	1.19E-05	2.65E-05	2.87E-04	3.26E-04	1.14E-05	6.61E-06	1.23E-04	1.41E-04	2.46E+00	2.81E-06	
T6 Utility	4.79E-05	5.83E-04	2.52E-04	2.33E-05	4.27E-06	2.65E-05	2.87E-04	3.18E-04	4.09E-06	6.61E-06	1.23E-04	1.34E-04	2.45E+00	2.22E-06	
T6TS	2.58E-05	2.58E-04	7.78E-04	2.31E-05	1.99E-06	2.65E-05	2.87E-04	3.16E-04	1.83E-06	6.61E-06	1.23E-04	1.32E-04	2.31E+00	1.04E-05	
T7 Ag	1.87E-04	4.38E-03	1.10E-03	3.41E-05	1.53E-05	7.94E-05	1.36E-04	2.31E-04	1.46E-05	1.98E-05	5.83E-05	9.28E-05	3.58E+00	8.66E-06	
T7 CAIRP	1.54E-04	1.86E-03	9.12E-04	3.00E-05	1.25E-05	7.94E-05	1.36E-04	2.28E-04	1.19E-05	1.98E-05	5.83E-05	9.01E-05	3.15E+00	7.17E-06	
T7 CAIRP Construction	1.56E-04	1.80E-03	9.19E-04	3.08E-05	1.27E-05	7.94E-05	1.36E-04	2.28E-04	1.21E-05	1.98E-05	5.83E-05	9.03E-05	3.22E+00	7.24E-06	
T7 NNOOS	1.33E-04	1.37E-03	7.85E-04	2.98E-05	1.03E-05	7.94E-05	1.36E-04	2.26E-04	9.83E-06	1.98E-05	5.83E-05	8.80E-05	3.12E+00	6.18E-06	
T7 NOOS	1.55E-04	1.88E-03	9.13E-04	3.01E-05	1.25E-05	7.94E-05	1.36E-04	2.28E-04	1.20E-05	1.98E-05	5.83E-05	9.01E-05	3.15E+00	7.18E-06	
T7 Other Port	1.60E-04	1.79E-03	9.45E-04	3.07E-05	1.31E-05	7.94E-05	1.36E-04	2.29E-04	1.25E-05	1.98E-05	5.83E-05	9.07E-05	3.21E+00	7.43E-06	
T7 POAK	1.62E-04	1.83E-03	9.54E-04	3.07E-05	1.32E-05	7.94E-05	1.36E-04	2.29E-04	1.27E-05	1.98E-05	5.83E-05	9.08E-05	3.22E+00	7.50E-06	
T7 Public	1.68E-04	1.13E-02	7.68E-04	3.36E-05	5.32E-05	7.94E-05	1.36E-04	2.69E-04	5.09E-05	1.98E-05	5.83E-05	1.29E-04	3.53E+00	7.80E-06	
T7 Single	1.36E-04	2.14E-03	8.05E-04	3.22E-05	1.05E-05	7.94E-05	1.36E-04	2.26E-04	1.00E-05	1.98E-05	5.83E-05	8.82E-05	3.38E+00	6.34E-06	
T7 Single Construction	1.29E-04	1.76E-03	7.59E-04	3.15E-05	1.00E-05	7.94E-05	1.36E-04	2.26E-04	9.61E-06	1.98E-05	5.83E-05	8.78E-05	3.31E+00	5.99E-06	
T7 SWCV	7.43E-05	6.46E-03	8.76E-03	2.13E-05	1.03E-05	7.94E-05	1.36E-04	2.26E-04	9.87E-06	1.98E-05	5.83E-05	8.80E-05	6.45E+00	2.53E-03	
T7 Tractor	1.64E-04	2.28E-03	9.66E-04	3.04E-05	1.33E-05	7.94E-05	1.36E-04	2.29E-04	1.28E-05	1.98E-05	5.83E-05	9.09E-05	3.19E+00	7.60E-06	
T7 Tractor Construction	1.66E-04	2.32E-03	9.76E-04	3.14E-05	1.37E-05	7.94E-05	1.36E-04	2.29E-04	1.31E-05	1.98E-05	5.83E-05	9.13E-05	3.29E+00	7.69E-06	
T7 Utility	9.98E-05	1.15E-03	5.89E-04	3.16E-05	6.76E-06	7.94E-05	1.36E-04	2.22E-04	6.47E-06	1.98E-05	5.83E-05	8.46E-05	3.31E+00	4.63E-06	
T7IS	5.36E-04	5.73E-03	6.37E-02	3.54E-05	1.97E-06	4.41E-05	1.36E-04	1.82E-04	1.81E-06	1.10E-05	5.83E-05	7.12E-05	3.45E+00	2.17E-04	
UBUS	1.58E-04	7.69E-03	2.54E-03	2.60E-05	9.42E-05	2.65E-05	1.18E-03	1.30E-03	9.01E-05	6.61E-06	5.06E-04	6.03E-04	3.03E+00	1.18E-04	

Air Quality & Greenhouse Gas Modeling

City + SOI

Santa Clara County 2030 - all Model
Years (40 MPH)

##	MTons/Mile													
Veh	PM2.5_RUN													
	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUN EX	PM10_PMTW	PM10_PMBW	PM10_Total	EX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_Total	CO2_RUNEX	CH4_RUNEX
All Other Buses	3.23E-08	5.40E-07	1.70E-07	1.08E-08	3.36E-09	1.20E-08	1.30E-07	1.46E-07	3.21E-09	3.00E-09	5.59E-08	6.21E-08	1.13E-03	1.50E-09
LDA	3.98E-09	2.26E-08	3.34E-07	1.60E-09	9.78E-10	8.00E-09	3.67E-08	4.57E-08	9.00E-10	2.00E-09	1.57E-08	1.86E-08	1.59E-04	1.59E-09
LDT1	7.74E-09	4.24E-08	5.44E-07	2.05E-09	1.24E-09	8.00E-09	3.67E-08	4.60E-08	1.14E-09	2.00E-09	1.57E-08	1.89E-08	2.05E-04	3.12E-09
LDT2	6.23E-09	3.59E-08	4.93E-07	2.33E-09	1.11E-09	8.00E-09	3.67E-08	4.59E-08	1.02E-09	2.00E-09	1.57E-08	1.88E-08	2.32E-04	2.51E-09
LHD1	3.33E-08	4.92E-07	3.10E-07	5.05E-09	6.79E-09	1.04E-08	7.64E-08	9.36E-08	6.48E-09	2.60E-09	3.28E-08	4.18E-08	5.17E-04	3.37E-09
LHD2	2.62E-08	1.81E-07	1.60E-07	5.26E-09	6.59E-09	1.08E-08	8.92E-08	1.07E-07	6.30E-09	2.71E-09	3.82E-08	4.72E-08	5.42E-04	1.66E-09
MCY	1.83E-06	1.01E-06	1.58E-05	1.84E-09	1.84E-09	4.00E-09	1.18E-08	1.76E-08	1.72E-09	1.00E-09	5.04E-09	7.76E-09	1.53E-04	3.93E-07
MDV	1.08E-08	6.23E-08	6.73E-07	3.16E-09	1.19E-09	8.00E-09	3.67E-08	4.59E-08	1.09E-09	2.00E-09	1.58E-08	1.88E-08	3.15E-04	4.31E-09
MH	2.13E-08	6.64E-07	4.04E-07	1.02E-08	9.30E-09	1.29E-08	1.30E-07	1.53E-07	8.87E-09	3.22E-09	5.59E-08	6.79E-08	1.03E-03	5.25E-09
Motor Coach	6.63E-08	7.86E-07	3.91E-07	1.52E-08	5.26E-09	1.20E-08	1.30E-07	1.48E-07	5.04E-09	3.00E-09	5.59E-08	6.39E-08	1.59E-03	3.08E-09
OBUS	9.40E-09	9.65E-08	2.62E-07	1.05E-08	8.87E-10	1.20E-08	1.30E-07	1.43E-07	8.16E-10	3.00E-09	5.59E-08	5.97E-08	1.05E-03	3.80E-09
SBUS	3.23E-08	1.07E-06	3.44E-07	8.37E-09	6.87E-09	1.04E-08	7.45E-07	7.62E-07	6.56E-09	2.59E-09	3.19E-07	3.28E-07	8.67E-04	4.16E-09
T6 Ag	3.59E-08	8.42E-07	1.89E-07	1.10E-08	3.78E-09	1.20E-08	1.30E-07	1.46E-07	3.62E-09	3.00E-09	5.59E-08	6.25E-08	1.16E-03	1.67E-09
T6 CAIRP Heavy	2.77E-08	3.71E-07	1.46E-07	1.03E-08	2.75E-09	1.20E-08	1.30E-07	1.45E-07	2.63E-09	3.00E-09	5.59E-08	6.15E-08	1.08E-03	1.29E-09
T6 CAIRP Small	2.61E-08	3.23E-07	1.37E-07	1.05E-08	2.53E-09	1.20E-08	1.30E-07	1.45E-07	2.43E-09	3.00E-09	5.59E-08	6.13E-08	1.10E-03	1.21E-09
T6 Instate Construction Heavy	3.19E-08	5.64E-07	1.68E-07	1.07E-08	3.33E-09	1.20E-08	1.30E-07	1.46E-07	3.18E-09	3.00E-09	5.59E-08	6.20E-08	1.13E-03	1.48E-09
T6 Instate Construction Small	2.87E-08	4.07E-07	1.51E-07	1.06E-08	2.92E-09	1.20E-08	1.30E-07	1.45E-07	2.79E-09	3.00E-09	5.59E-08	6.17E-08	1.11E-03	1.33E-09
T6 Instate Heavy	3.27E-08	6.12E-07	1.72E-07	1.05E-08	3.39E-09	1.20E-08	1.30E-07	1.46E-07	3.24E-09	3.00E-09	5.59E-08	6.21E-08	1.10E-03	1.52E-09
T6 Instate Small	2.92E-08	4.23E-07	1.54E-07	1.06E-08	2.96E-09	1.20E-08	1.30E-07	1.45E-07	2.83E-09	3.00E-09	5.59E-08	6.17E-08	1.11E-03	1.36E-09
T6 OOS Heavy	2.77E-08	3.74E-07	1.46E-07	1.03E-08	2.76E-09	1.20E-08	1.30E-07	1.45E-07	2.64E-09	3.00E-09	5.59E-08	6.15E-08	1.08E-03	1.29E-09
T6 OOS Small	2.61E-08	3.23E-07	1.37E-07	1.05E-08	2.53E-09	1.20E-08	1.30E-07	1.45E-07	2.43E-09	3.00E-09	5.59E-08	6.13E-08	1.10E-03	1.21E-09
T6 Public	2.75E-08	1.02E-06	1.28E-07	1.07E-08	5.39E-09	1.20E-08	1.30E-07	1.48E-07	5.15E-09	3.00E-09	5.59E-08	6.40E-08	1.12E-03	1.28E-09
T6 Utility	2.17E-08	2.64E-07	1.14E-07	1.06E-08	1.94E-09	1.20E-08	1.30E-07	1.44E-07	1.85E-09	3.00E-09	5.59E-08	6.07E-08	1.11E-03	1.01E-09
T6TS	1.17E-08	1.17E-07	3.53E-07	1.05E-08	9.02E-10	1.20E-08	1.30E-07	1.43E-07	8.29E-10	3.00E-09	5.59E-08	5.97E-08	1.05E-03	4.74E-09
T7 Ag	8.46E-08	1.99E-06	5.00E-07	1.55E-08	6.93E-09	3.60E-08	6.17E-08	1.05E-07	6.63E-09	9.00E-09	2.65E-08	4.21E-08	1.62E-03	3.93E-09
T7 CAIRP	7.00E-08	8.45E-07	4.14E-07	1.36E-08	5.65E-09	3.60E-08	6.17E-08	1.03E-07	5.41E-09	9.00E-09	2.65E-08	4.09E-08	1.43E-03	3.25E-09
T7 CAIRP Construction	7.07E-08	8.17E-07	4.17E-07	1.40E-08	5.76E-09	3.60E-08	6.17E-08	1.03E-07	5.51E-09	9.00E-09	2.65E-08	4.10E-08	1.46E-03	3.28E-09
T7 NNOOS	6.03E-08	6.22E-07	3.56E-07	1.35E-08	4.66E-09	3.60E-08	6.17E-08	1.02E-07	4.46E-09	9.00E-09	2.65E-08	3.99E-08	1.42E-03	2.80E-09
T7 NOOS	7.02E-08	8.51E-07	4.14E-07	1.36E-08	5.67E-09	3.60E-08	6.17E-08	1.03E-07	5.42E-09	9.00E-09	2.65E-08	4.09E-08	1.43E-03	3.26E-09
T7 Other Port	7.26E-08	8.14E-07	4.28E-07	1.39E-08	5.94E-09	3.60E-08	6.17E-08	1.04E-07	5.68E-09	9.00E-09	2.65E-08	4.11E-08	1.46E-03	3.37E-09
T7 POAK	7.33E-08	8.31E-07	4.33E-07	1.39E-08	6.01E-09	3.60E-08	6.17E-08	1.04E-07	5.75E-09	9.00E-09	2.65E-08	4.12E-08	1.46E-03	3.40E-09
T7 Public	7.61E-08	5.13E-06	3.48E-07	1.53E-08	2.41E-08	3.60E-08	6.17E-08	1.22E-07	2.31E-08	9.00E-09	2.65E-08	5.85E-08	1.60E-03	3.54E-09
T7 Single	6.19E-08	9.71E-07	3.65E-07	1.46E-08	4.74E-09	3.60E-08	6.17E-08	1.02E-07	4.54E-09	9.00E-09	2.65E-08	4.00E-08	1.53E-03	2.87E-09
T7 Single Construction	5.85E-08	7.98E-07	3.44E-07	1.43E-08	4.55E-09	3.60E-08	6.17E-08	1.02E-07	4.36E-09	9.00E-09	2.65E-08	3.98E-08	1.50E-03	2.72E-09
T7 SWCV	3.37E-08	2.93E-06	3.97E-06	9.65E-09	4.68E-09	3.60E-08	6.17E-08	1.02E-07	4.48E-09	9.00E-09	2.65E-08	3.99E-08	2.93E-03	1.15E-06
T7 Tractor	7.42E-08	1.03E-06	4.38E-07	1.38E-08	6.05E-09	3.60E-08	6.17E-08	1.04E-07	5.79E-09	9.00E-09	2.65E-08	4.13E-08	1.45E-03	3.45E-09
T7 Tractor Construction	7.51E-08	1.05E-06	4.43E-07	1.42E-08	6.21E-09	3.60E-08	6.17E-08	1.04E-07	5.94E-09	9.00E-09	2.65E-08	4.14E-08	1.49E-03	3.49E-09
T7 Utility	4.52E-08	5.20E-07	2.67E-07	1.43E-08	3.07E-09	3.60E-08	6.17E-08	1.01E-07	2.94E-09	9.00E-09	2.65E-08	3.84E-08	1.50E-03	2.10E-09
T7IS	2.43E-07	2.60E-06	2.89E-05	1.61E-08	8.92E-10	2.00E-08	6.17E-08	8.26E-08	8.20E-10	5.00E-09	2.65E-08	3.23E-08	1.56E-03	9.83E-08
UBUS	7.16E-08	3.49E-06	1.15E-06	1.18E-08	4.27E-08	1.20E-08	5.36E-07	5.91E-07	4.09E-08	3.00E-09	2.30E-07	2.74E-07	1.38E-03	5.37E-08

2030 - Existing City + SOI

Based on EMFAC2014

Emission year	Daily							
2030	3,541,480		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.02%	5.04E-02	8.43E-01	2.65E-01	1.68E-02	2.27E-01	9.69E-02
LDA	62.15%	71.18%	2.21E+01	1.25E+02	1.86E+03	8.87E+00	2.54E+02	1.04E+02
LDT1	3.41%	3.90%	2.36E+00	1.29E+01	1.66E+02	6.25E-01	1.40E+01	5.75E+00
LDT2	18.01%	20.63%	1.00E+01	5.79E+01	7.94E+02	3.75E+00	7.39E+01	3.02E+01
LHD1	1.19%	0.28%	7.17E-01	1.06E+01	6.66E+00	1.09E-01	2.02E+00	9.00E-01
LHD2	0.51%	0.12%	2.40E-01	1.66E+00	1.46E+00	4.83E-02	9.79E-01	4.34E-01
MCY	0.51%	0.59%	8.38E+01	4.65E+01	7.24E+02	8.42E-02	8.06E-01	3.55E-01
MDV	10.12%	2.35%	1.98E+00	1.14E+01	1.24E+02	5.80E-01	8.44E+00	3.46E+00
MH	0.07%	0.02%	2.51E-02	7.83E-01	4.77E-01	1.21E-02	1.80E-01	8.02E-02
Motor Coach	0.04%	0.01%	4.52E-02	5.36E-01	2.67E-01	1.04E-02	1.01E-01	4.36E-02
OBUS	0.10%	0.02%	1.68E-02	1.72E-01	4.68E-01	1.87E-02	2.56E-01	1.07E-01
SBUS	0.06%	0.02%	3.79E-02	1.26E+00	4.03E-01	9.81E-03	8.93E-01	3.85E-01
T6 Ag	0.00%	0.00%	3.09E-03	7.26E-02	1.63E-02	9.52E-04	1.26E-02	5.39E-03
T6 CAIRP Heavy	0.00%	0.00%	1.04E-03	1.40E-02	5.48E-03	3.86E-04	5.46E-03	2.31E-03
T6 CAIRP Small	0.01%	0.00%	3.01E-03	3.73E-02	1.58E-02	1.21E-03	1.67E-02	7.08E-03
T6 Instate Construction Heavy	0.04%	0.01%	2.19E-02	3.87E-01	1.15E-01	7.38E-03	1.00E-01	4.26E-02
T6 Instate Construction Small	0.09%	0.02%	4.62E-02	6.55E-01	2.43E-01	1.71E-02	2.34E-01	9.92E-02
T6 Instate Heavy	0.27%	0.06%	1.61E-01	3.01E+00	8.45E-01	5.14E-02	7.16E-01	3.05E-01
T6 Instate Small	0.69%	0.16%	3.63E-01	5.26E+00	1.91E+00	1.32E-01	1.81E+00	7.67E-01
T6 OOS Heavy	0.00%	0.00%	5.98E-04	8.05E-03	3.15E-03	2.21E-04	3.13E-03	1.33E-03
T6 OOS Small	0.00%	0.00%	1.72E-03	2.14E-02	9.07E-03	6.96E-04	9.58E-03	4.05E-03
T6 Public	0.03%	0.01%	1.44E-02	5.32E-01	6.71E-02	5.58E-03	7.73E-02	3.35E-02
T6 Utility	0.00%	0.00%	1.89E-03	2.31E-02	9.97E-03	9.23E-04	1.26E-02	5.30E-03
T6TS	0.18%	0.04%	3.76E-02	3.76E-01	1.13E+00	3.36E-02	4.60E-01	1.92E-01
T7 Ag	0.00%	0.00%	6.23E-03	1.46E-01	3.68E-02	1.14E-03	7.70E-03	3.10E-03
T7 CAIRP	0.36%	0.08%	4.62E-01	5.57E+00	2.73E+00	8.99E-02	6.82E-01	2.70E-01
T7 CAIRP Construction	0.03%	0.01%	3.44E-02	3.98E-01	2.03E-01	6.80E-03	5.04E-02	2.00E-02
T7 NNOOS	0.45%	0.10%	4.93E-01	5.08E+00	2.91E+00	1.11E-01	8.38E-01	3.26E-01
T7 NOOS	0.14%	0.03%	1.83E-01	2.22E+00	1.08E+00	3.55E-02	2.69E-01	1.07E-01
T7 Other Port	0.07%	0.02%	8.97E-02	1.01E+00	5.30E-01	1.72E-02	1.28E-01	5.08E-02
T7 POAK	0.21%	0.05%	2.84E-01	3.22E+00	1.68E+00	5.39E-02	4.02E-01	1.60E-01
T7 Public	0.02%	0.00%	2.68E-02	1.81E+00	1.22E-01	5.37E-03	4.28E-02	2.06E-02
T7 Single	0.13%	0.03%	1.49E-01	2.34E+00	8.78E-01	3.51E-02	2.46E-01	9.62E-02
T7 Single Construction	0.07%	0.02%	7.37E-02	1.01E+00	4.34E-01	1.80E-02	1.29E-01	5.02E-02
T7 SWCV	0.04%	0.01%	2.34E-02	2.04E+00	2.76E+00	6.70E-03	7.11E-02	2.77E-02
T7 Tractor	0.68%	0.16%	9.15E-01	1.27E+01	5.40E+00	1.70E-01	1.28E+00	5.09E-01
T7 Tractor Construction	0.05%	0.01%	7.05E-02	9.90E-01	4.16E-01	1.34E-02	9.77E-02	3.89E-02
T7 Utility	0.00%	0.00%	2.32E-03	2.67E-02	1.37E-02	7.36E-04	5.18E-03	1.97E-03
T7IS	0.02%	0.01%	1.05E-01	1.12E+00	1.24E+01	6.92E-03	3.56E-02	1.39E-02
UBUS	0.15%	0.03%	1.91E-01	9.30E+00	3.07E+00	3.14E-02	1.57E+00	7.29E-01
TOTAL	100%	100%	125	329	3,714	15	365	149

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 1

Based on EMFAC2014

Emission year	Daily							
2030	3,940,470		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.02%	5.99E-02	1.00E+00	3.15E-01	1.99E-02	2.70E-01	1.15E-01
LDA	62.15%	71.00%	2.45E+01	1.39E+02	2.06E+03	9.84E+00	2.82E+02	1.15E+02
LDT1	3.41%	3.89%	2.62E+00	1.43E+01	1.84E+02	6.94E-01	1.55E+01	6.38E+00
LDT2	18.01%	20.58%	1.11E+01	6.43E+01	8.81E+02	4.16E+00	8.20E+01	3.36E+01
LHD1	1.19%	0.29%	8.51E-01	1.26E+01	7.91E+00	1.29E-01	2.39E+00	1.07E+00
LHD2	0.51%	0.13%	2.85E-01	1.97E+00	1.74E+00	5.74E-02	1.16E+00	5.15E-01
MCY	0.51%	0.59%	9.30E+01	5.16E+01	8.04E+02	9.34E-02	8.95E-01	3.94E-01
MDV	10.12%	2.51%	2.35E+00	1.36E+01	1.47E+02	6.88E-01	1.00E+01	4.11E+00
MH	0.07%	0.02%	2.98E-02	9.30E-01	5.66E-01	1.44E-02	2.14E-01	9.52E-02
Motor Coach	0.04%	0.01%	5.37E-02	6.36E-01	3.17E-01	1.23E-02	1.20E-01	5.17E-02
OBUS	0.10%	0.02%	1.99E-02	2.05E-01	5.56E-01	2.22E-02	3.04E-01	1.27E-01
SBUS	0.06%	0.02%	4.50E-02	1.49E+00	4.79E-01	1.16E-02	1.06E+00	4.57E-01
T6 Ag	0.00%	0.00%	3.67E-03	8.62E-02	1.93E-02	1.13E-03	1.50E-02	6.40E-03
T6 CAIRP Heavy	0.00%	0.00%	1.24E-03	1.66E-02	6.50E-03	4.59E-04	6.48E-03	2.74E-03
T6 CAIRP Small	0.01%	0.00%	3.57E-03	4.42E-02	1.88E-02	1.44E-03	1.98E-02	8.40E-03
T6 Instate Construction Heavy	0.04%	0.01%	2.60E-02	4.60E-01	1.37E-01	8.76E-03	1.19E-01	5.06E-02
T6 Instate Construction Small	0.09%	0.02%	5.49E-02	7.77E-01	2.88E-01	2.03E-02	2.77E-01	1.18E-01
T6 Instate Heavy	0.27%	0.07%	1.91E-01	3.57E+00	1.00E+00	6.11E-02	8.50E-01	3.62E-01
T6 Instate Small	0.69%	0.17%	4.31E-01	6.24E+00	2.27E+00	1.57E-01	2.14E+00	9.10E-01
T6 OOS Heavy	0.00%	0.00%	7.09E-04	9.56E-03	3.73E-03	2.63E-04	3.71E-03	1.57E-03
T6 OOS Small	0.00%	0.00%	2.05E-03	2.53E-02	1.08E-02	8.26E-04	1.14E-02	4.81E-03
T6 Public	0.03%	0.01%	1.71E-02	6.31E-01	7.96E-02	6.62E-03	9.17E-02	3.97E-02
T6 Utility	0.00%	0.00%	2.25E-03	2.74E-02	1.18E-02	1.10E-03	1.49E-02	6.29E-03
T6TS	0.18%	0.04%	4.47E-02	4.46E-01	1.34E+00	3.99E-02	5.46E-01	2.27E-01
T7 Ag	0.00%	0.00%	7.39E-03	1.73E-01	4.36E-02	1.35E-03	9.14E-03	3.68E-03
T7 CAIRP	0.36%	0.09%	5.48E-01	6.61E+00	3.24E+00	1.07E-01	8.09E-01	3.20E-01
T7 CAIRP Construction	0.03%	0.01%	4.09E-02	4.72E-01	2.41E-01	8.07E-03	5.98E-02	2.37E-02
T7 NNOOS	0.45%	0.11%	5.85E-01	6.03E+00	3.46E+00	1.31E-01	9.94E-01	3.87E-01
T7 NOOS	0.14%	0.04%	2.17E-01	2.63E+00	1.28E+00	4.22E-02	3.20E-01	1.26E-01
T7 Other Port	0.07%	0.02%	1.06E-01	1.19E+00	6.29E-01	2.04E-02	1.52E-01	6.03E-02
T7 POAK	0.21%	0.05%	3.37E-01	3.82E+00	1.99E+00	6.40E-02	4.77E-01	1.89E-01
T7 Public	0.02%	0.00%	3.18E-02	2.14E+00	1.45E-01	6.37E-03	5.09E-02	2.44E-02
T7 Single	0.13%	0.03%	1.77E-01	2.77E+00	1.04E+00	4.17E-02	2.92E-01	1.14E-01
T7 Single Construction	0.07%	0.02%	8.75E-02	1.19E+00	5.15E-01	2.14E-02	1.53E-01	5.96E-02
T7 SWCV	0.04%	0.01%	2.78E-02	2.42E+00	3.27E+00	7.95E-03	8.44E-02	3.29E-02
T7 Tractor	0.68%	0.17%	1.09E+00	1.51E+01	6.41E+00	2.02E-01	1.52E+00	6.04E-01
T7 Tractor Construction	0.05%	0.01%	8.37E-02	1.17E+00	4.94E-01	1.59E-02	1.16E-01	4.62E-02
T7 Utility	0.00%	0.00%	2.76E-03	3.17E-02	1.63E-02	8.74E-04	6.15E-03	2.34E-03
T7IS	0.02%	0.01%	1.24E-01	1.33E+00	1.48E+01	8.21E-03	4.22E-02	1.65E-02
UBUS	0.15%	0.04%	2.27E-01	1.10E+01	3.65E+00	3.73E-02	1.87E+00	8.66E-01
TOTAL	100%	100%	139	372	4,135	17	407	167

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 1

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2030	1,367,343,090	1	21	310	MTons	
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.02%	3.29E+02	4.38E-04	1.57E-01	0	330
LDA	62.15%	71.00%	1.55E+05	1.54E+00	2.19E+01	1	155,016
LDT1	3.41%	3.89%	1.09E+04	1.66E-01	2.25E+00	0	10,927
LDT2	18.01%	20.58%	6.53E+04	7.06E-01	1.01E+01	0	65,461
LHD1	1.19%	0.29%	2.08E+03	1.35E-02	1.98E+00	0	2,097
LHD2	0.51%	0.13%	9.30E+02	2.84E-03	3.10E-01	0	933
MCY	0.51%	0.59%	1.22E+03	3.15E+00	8.12E+00	0	1,367
MDV	10.12%	2.51%	1.08E+04	1.48E-01	2.14E+00	0	10,850
MH	0.07%	0.02%	2.28E+02	1.16E-03	1.46E-01	0	230
Motor Coach	0.04%	0.01%	2.03E+02	3.92E-04	1.00E-01	0	204
OBUS	0.10%	0.02%	3.50E+02	1.27E-03	3.22E-02	0	351
SBUS	0.06%	0.02%	1.90E+02	9.11E-04	2.35E-01	0	192
T6 Ag	0.00%	0.00%	1.86E+01	2.69E-05	1.36E-02	0	19
T6 CAIRP Heavy	0.00%	0.00%	7.57E+00	9.03E-06	2.61E-03	0	8
T6 CAIRP Small	0.01%	0.00%	2.38E+01	2.61E-05	6.96E-03	0	24
T6 Instate Construction Heavy	0.04%	0.01%	1.45E+02	1.90E-04	7.23E-02	0	145
T6 Instate Construction Small	0.09%	0.02%	3.34E+02	4.01E-04	1.22E-01	0	335
T6 Instate Heavy	0.27%	0.07%	1.01E+03	1.39E-03	5.62E-01	0	1,013
T6 Instate Small	0.69%	0.17%	2.59E+03	3.15E-03	9.82E-01	0	2,598
T6 OOS Heavy	0.00%	0.00%	4.34E+00	5.19E-06	1.50E-03	0	4
T6 OOS Small	0.00%	0.00%	1.36E+01	1.50E-05	3.99E-03	0	14
T6 Public	0.03%	0.01%	1.09E+02	1.25E-04	9.93E-02	0	110
T6 Utility	0.00%	0.00%	1.81E+01	1.64E-05	4.31E-03	0	18
T6TS	0.18%	0.04%	6.29E+02	2.84E-03	7.02E-02	0	630
T7 Ag	0.00%	0.00%	2.23E+01	5.40E-05	2.73E-02	0	23
T7 CAIRP	0.36%	0.09%	1.76E+03	4.01E-03	1.04E+00	0	1,770
T7 CAIRP Construction	0.03%	0.01%	1.33E+02	2.99E-04	7.44E-02	0	134
T7 NNOOS	0.45%	0.11%	2.17E+03	4.28E-03	9.50E-01	0	2,175
T7 NOOS	0.14%	0.04%	6.95E+02	1.59E-03	4.14E-01	0	700
T7 Other Port	0.07%	0.02%	3.36E+02	7.78E-04	1.88E-01	0	338
T7 POAK	0.21%	0.05%	1.06E+03	2.46E-03	6.01E-01	0	1,062
T7 Public	0.02%	0.00%	1.05E+02	2.32E-04	3.37E-01	0	108
T7 Single	0.13%	0.03%	6.88E+02	1.29E-03	4.36E-01	0	692
T7 Single Construction	0.07%	0.02%	3.53E+02	6.40E-04	1.88E-01	0	355
T7 SWCV	0.04%	0.01%	3.80E+02	1.49E-01	3.80E-01	0	386
T7 Tractor	0.68%	0.17%	3.33E+03	7.94E-03	2.38E+00	0	3,358
T7 Tractor Construction	0.05%	0.01%	2.62E+02	6.12E-04	1.85E-01	0	264
T7 Utility	0.00%	0.00%	1.44E+01	2.02E-05	5.00E-03	0	14
T7IS	0.02%	0.01%	1.26E+02	7.90E-03	2.09E-01	0	128
UBUS	0.15%	0.04%	6.85E+02	2.68E-02	1.74E+00	0	703
TOTAL	100%	100%	264,386	6	59	2	265,088

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x)

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 2

Based on EMFAC2014

Emission year	Daily							
2030	3,818,350		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.02%	5.80E-02	9.69E-01	3.05E-01	1.93E-02	2.61E-01	1.11E-01
LDA	62.15%	71.00%	2.38E+01	1.35E+02	2.00E+03	9.53E+00	2.73E+02	1.11E+02
LDT1	3.41%	3.89%	2.53E+00	1.39E+01	1.78E+02	6.73E-01	1.51E+01	6.19E+00
LDT2	18.01%	20.58%	1.08E+01	6.23E+01	8.54E+02	4.03E+00	7.94E+01	3.25E+01
LHD1	1.19%	0.29%	8.25E-01	1.22E+01	7.66E+00	1.25E-01	2.32E+00	1.04E+00
LHD2	0.51%	0.13%	2.76E-01	1.91E+00	1.68E+00	5.56E-02	1.13E+00	4.99E-01
MCY	0.51%	0.59%	9.01E+01	5.00E+01	7.79E+02	9.05E-02	8.67E-01	3.82E-01
MDV	10.12%	2.51%	2.28E+00	1.32E+01	1.42E+02	6.67E-01	9.71E+00	3.98E+00
MH	0.07%	0.02%	2.89E-02	9.01E-01	5.49E-01	1.39E-02	2.07E-01	9.23E-02
Motor Coach	0.04%	0.01%	5.20E-02	6.17E-01	3.07E-01	1.19E-02	1.16E-01	5.01E-02
OBUS	0.10%	0.02%	1.93E-02	1.98E-01	5.39E-01	2.15E-02	2.94E-01	1.23E-01
SBUS	0.06%	0.02%	4.36E-02	1.45E+00	4.64E-01	1.13E-02	1.03E+00	4.43E-01
T6 Ag	0.00%	0.00%	3.56E-03	8.35E-02	1.87E-02	1.09E-03	1.45E-02	6.20E-03
T6 CAIRP Heavy	0.00%	0.00%	1.20E-03	1.60E-02	6.30E-03	4.44E-04	6.28E-03	2.66E-03
T6 CAIRP Small	0.01%	0.00%	3.46E-03	4.29E-02	1.82E-02	1.40E-03	1.92E-02	8.14E-03
T6 Instate Construction Heavy	0.04%	0.01%	2.52E-02	4.45E-01	1.32E-01	8.49E-03	1.15E-01	4.90E-02
T6 Instate Construction Small	0.09%	0.02%	5.32E-02	7.53E-01	2.80E-01	1.96E-02	2.69E-01	1.14E-01
T6 Instate Heavy	0.27%	0.07%	1.85E-01	3.46E+00	9.72E-01	5.92E-02	8.24E-01	3.51E-01
T6 Instate Small	0.69%	0.17%	4.18E-01	6.04E+00	2.20E+00	1.52E-01	2.08E+00	8.82E-01
T6 OOS Heavy	0.00%	0.00%	6.87E-04	9.26E-03	3.62E-03	2.55E-04	3.60E-03	1.52E-03
T6 OOS Small	0.00%	0.00%	1.98E-03	2.46E-02	1.04E-02	8.00E-04	1.10E-02	4.66E-03
T6 Public	0.03%	0.01%	1.65E-02	6.12E-01	7.72E-02	6.42E-03	8.89E-02	3.85E-02
T6 Utility	0.00%	0.00%	2.18E-03	2.65E-02	1.15E-02	1.06E-03	1.45E-02	6.09E-03
T6TS	0.18%	0.04%	4.33E-02	4.32E-01	1.30E+00	3.87E-02	5.29E-01	2.20E-01
T7 Ag	0.00%	0.00%	7.16E-03	1.68E-01	4.23E-02	1.31E-03	8.86E-03	3.56E-03
T7 CAIRP	0.36%	0.09%	5.31E-01	6.41E+00	3.14E+00	1.03E-01	7.84E-01	3.10E-01
T7 CAIRP Construction	0.03%	0.01%	3.96E-02	4.58E-01	2.34E-01	7.82E-03	5.80E-02	2.30E-02
T7 NNOOS	0.45%	0.11%	5.67E-01	5.85E+00	3.35E+00	1.27E-01	9.63E-01	3.75E-01
T7 NOOS	0.14%	0.04%	2.10E-01	2.55E+00	1.24E+00	4.08E-02	3.10E-01	1.22E-01
T7 Other Port	0.07%	0.02%	1.03E-01	1.16E+00	6.09E-01	1.98E-02	1.47E-01	5.85E-02
T7 POAK	0.21%	0.05%	3.26E-01	3.70E+00	1.93E+00	6.20E-02	4.62E-01	1.84E-01
T7 Public	0.02%	0.00%	3.08E-02	2.08E+00	1.41E-01	6.17E-03	4.93E-02	2.37E-02
T7 Single	0.13%	0.03%	1.71E-01	2.69E+00	1.01E+00	4.04E-02	2.83E-01	1.11E-01
T7 Single Construction	0.07%	0.02%	8.48E-02	1.16E+00	4.99E-01	2.07E-02	1.48E-01	5.77E-02
T7 SWCV	0.04%	0.01%	2.69E-02	2.34E+00	3.17E+00	7.70E-03	8.18E-02	3.19E-02
T7 Tractor	0.68%	0.17%	1.05E+00	1.47E+01	6.21E+00	1.96E-01	1.47E+00	5.85E-01
T7 Tractor Construction	0.05%	0.01%	8.11E-02	1.14E+00	4.78E-01	1.54E-02	1.12E-01	4.47E-02
T7 Utility	0.00%	0.00%	2.67E-03	3.08E-02	1.58E-02	8.47E-04	5.96E-03	2.27E-03
T7IS	0.02%	0.01%	1.20E-01	1.29E+00	1.43E+01	7.96E-03	4.09E-02	1.60E-02
UBUS	0.15%	0.04%	2.20E-01	1.07E+01	3.54E+00	3.61E-02	1.81E+00	8.39E-01
TOTAL	100%	100%	135	361	4,006	16	394	161

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 2

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2030	1,324,967,450	1	21	310	MTons	
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.02%	3.19E+02	4.24E-04	1.53E-01	0	320
LDA	62.15%	71.00%	1.50E+05	1.49E+00	2.12E+01	1	150,212
LDT1	3.41%	3.89%	1.06E+04	1.61E-01	2.18E+00	0	10,588
LDT2	18.01%	20.58%	6.33E+04	6.84E-01	9.80E+00	0	63,432
LHD1	1.19%	0.29%	2.01E+03	1.31E-02	1.92E+00	0	2,032
LHD2	0.51%	0.13%	9.01E+02	2.75E-03	3.01E-01	0	904
MCY	0.51%	0.59%	1.18E+03	3.05E+00	7.87E+00	0	1,325
MDV	10.12%	2.51%	1.05E+04	1.43E-01	2.07E+00	0	10,514
MH	0.07%	0.02%	2.21E+02	1.12E-03	1.42E-01	0	223
Motor Coach	0.04%	0.01%	1.97E+02	3.80E-04	9.71E-02	0	198
OBUS	0.10%	0.02%	3.40E+02	1.23E-03	3.12E-02	0	340
SBUS	0.06%	0.02%	1.84E+02	8.83E-04	2.28E-01	0	186
T6 Ag	0.00%	0.00%	1.81E+01	2.60E-05	1.31E-02	0	18
T6 CAIRP Heavy	0.00%	0.00%	7.33E+00	8.75E-06	2.53E-03	0	7
T6 CAIRP Small	0.01%	0.00%	2.30E+01	2.53E-05	6.75E-03	0	23
T6 Instate Construction Heavy	0.04%	0.01%	1.40E+02	1.84E-04	7.01E-02	0	141
T6 Instate Construction Small	0.09%	0.02%	3.24E+02	3.89E-04	1.19E-01	0	325
T6 Instate Heavy	0.27%	0.07%	9.76E+02	1.35E-03	5.45E-01	0	981
T6 Instate Small	0.69%	0.17%	2.51E+03	3.05E-03	9.51E-01	0	2,518
T6 OOS Heavy	0.00%	0.00%	4.20E+00	5.03E-06	1.46E-03	0	4
T6 OOS Small	0.00%	0.00%	1.32E+01	1.45E-05	3.86E-03	0	13
T6 Public	0.03%	0.01%	1.06E+02	1.21E-04	9.63E-02	0	107
T6 Utility	0.00%	0.00%	1.75E+01	1.59E-05	4.17E-03	0	18
T6TS	0.18%	0.04%	6.10E+02	2.75E-03	6.80E-02	0	611
T7 Ag	0.00%	0.00%	2.16E+01	5.23E-05	2.64E-02	0	22
T7 CAIRP	0.36%	0.09%	1.71E+03	3.88E-03	1.01E+00	0	1,716
T7 CAIRP Construction	0.03%	0.01%	1.29E+02	2.89E-04	7.20E-02	0	130
T7 NNOOS	0.45%	0.11%	2.10E+03	4.15E-03	9.20E-01	0	2,108
T7 NOOS	0.14%	0.04%	6.74E+02	1.54E-03	4.01E-01	0	678
T7 Other Port	0.07%	0.02%	3.26E+02	7.54E-04	1.82E-01	0	328
T7 POAK	0.21%	0.05%	1.02E+03	2.39E-03	5.83E-01	0	1,029
T7 Public	0.02%	0.00%	1.02E+02	2.25E-04	3.27E-01	0	105
T7 Single	0.13%	0.03%	6.66E+02	1.25E-03	4.23E-01	0	671
T7 Single Construction	0.07%	0.02%	3.42E+02	6.20E-04	1.82E-01	0	344
T7 SWCV	0.04%	0.01%	3.68E+02	1.44E-01	3.69E-01	0	374
T7 Tractor	0.68%	0.17%	3.23E+03	7.69E-03	2.31E+00	0	3,254
T7 Tractor Construction	0.05%	0.01%	2.54E+02	5.93E-04	1.79E-01	0	256
T7 Utility	0.00%	0.00%	1.40E+01	1.95E-05	4.84E-03	0	14
T7IS	0.02%	0.01%	1.22E+02	7.66E-03	2.03E-01	0	124
UBUS	0.15%	0.04%	6.64E+02	2.59E-02	1.68E+00	0	681
TOTAL	100%	100%	256,192	6	57	2	256,873

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x)

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 3

Based on EMFAC2014

Emission year	Daily							
2030	3,879,140		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.02%	5.89E-02	9.85E-01	3.10E-01	1.96E-02	2.66E-01	1.13E-01
LDA	62.15%	71.00%	2.42E+01	1.37E+02	2.03E+03	9.69E+00	2.78E+02	1.13E+02
LDT1	3.41%	3.89%	2.57E+00	1.41E+01	1.81E+02	6.83E-01	1.53E+01	6.29E+00
LDT2	18.01%	20.58%	1.10E+01	6.33E+01	8.68E+02	4.09E+00	8.07E+01	3.30E+01
LHD1	1.19%	0.29%	8.38E-01	1.24E+01	7.78E+00	1.27E-01	2.35E+00	1.05E+00
LHD2	0.51%	0.13%	2.81E-01	1.94E+00	1.71E+00	5.65E-02	1.14E+00	5.07E-01
MCY	0.51%	0.59%	9.16E+01	5.08E+01	7.91E+02	9.20E-02	8.81E-01	3.88E-01
MDV	10.12%	2.51%	2.32E+00	1.34E+01	1.44E+02	6.77E-01	9.86E+00	4.04E+00
MH	0.07%	0.02%	2.94E-02	9.15E-01	5.57E-01	1.41E-02	2.10E-01	9.37E-02
Motor Coach	0.04%	0.01%	5.28E-02	6.26E-01	3.12E-01	1.21E-02	1.18E-01	5.09E-02
OBUS	0.10%	0.02%	1.96E-02	2.01E-01	5.47E-01	2.19E-02	2.99E-01	1.25E-01
SBUS	0.06%	0.02%	4.43E-02	1.47E+00	4.71E-01	1.15E-02	1.04E+00	4.50E-01
T6 Ag	0.00%	0.00%	3.62E-03	8.48E-02	1.90E-02	1.11E-03	1.47E-02	6.30E-03
T6 CAIRP Heavy	0.00%	0.00%	1.22E-03	1.63E-02	6.40E-03	4.51E-04	6.38E-03	2.70E-03
T6 CAIRP Small	0.01%	0.00%	3.51E-03	4.35E-02	1.85E-02	1.42E-03	1.95E-02	8.27E-03
T6 Instate Construction Heavy	0.04%	0.01%	2.56E-02	4.52E-01	1.34E-01	8.62E-03	1.17E-01	4.98E-02
T6 Instate Construction Small	0.09%	0.02%	5.40E-02	7.65E-01	2.84E-01	1.99E-02	2.73E-01	1.16E-01
T6 Instate Heavy	0.27%	0.07%	1.88E-01	3.51E+00	9.87E-01	6.01E-02	8.37E-01	3.57E-01
T6 Instate Small	0.69%	0.17%	4.25E-01	6.14E+00	2.23E+00	1.54E-01	2.11E+00	8.96E-01
T6 OOS Heavy	0.00%	0.00%	6.98E-04	9.41E-03	3.68E-03	2.59E-04	3.65E-03	1.55E-03
T6 OOS Small	0.00%	0.00%	2.01E-03	2.49E-02	1.06E-02	8.13E-04	1.12E-02	4.74E-03
T6 Public	0.03%	0.01%	1.68E-02	6.21E-01	7.84E-02	6.52E-03	9.03E-02	3.91E-02
T6 Utility	0.00%	0.00%	2.21E-03	2.69E-02	1.16E-02	1.08E-03	1.47E-02	6.19E-03
T6TS	0.18%	0.04%	4.40E-02	4.39E-01	1.32E+00	3.93E-02	5.37E-01	2.24E-01
T7 Ag	0.00%	0.00%	7.27E-03	1.71E-01	4.30E-02	1.33E-03	9.00E-03	3.62E-03
T7 CAIRP	0.36%	0.09%	5.40E-01	6.51E+00	3.19E+00	1.05E-01	7.97E-01	3.15E-01
T7 CAIRP Construction	0.03%	0.01%	4.02E-02	4.65E-01	2.37E-01	7.94E-03	5.89E-02	2.33E-02
T7 NNOOS	0.45%	0.11%	5.76E-01	5.94E+00	3.40E+00	1.29E-01	9.79E-01	3.81E-01
T7 NOOS	0.14%	0.04%	2.14E-01	2.59E+00	1.26E+00	4.15E-02	3.15E-01	1.24E-01
T7 Other Port	0.07%	0.02%	1.05E-01	1.18E+00	6.19E-01	2.01E-02	1.50E-01	5.94E-02
T7 POAK	0.21%	0.05%	3.32E-01	3.76E+00	1.96E+00	6.30E-02	4.70E-01	1.87E-01
T7 Public	0.02%	0.00%	3.13E-02	2.11E+00	1.43E-01	6.27E-03	5.01E-02	2.40E-02
T7 Single	0.13%	0.03%	1.74E-01	2.73E+00	1.03E+00	4.10E-02	2.88E-01	1.12E-01
T7 Single Construction	0.07%	0.02%	8.61E-02	1.18E+00	5.07E-01	2.11E-02	1.51E-01	5.86E-02
T7 SWCV	0.04%	0.01%	2.74E-02	2.38E+00	3.22E+00	7.83E-03	8.31E-02	3.24E-02
T7 Tractor	0.68%	0.17%	1.07E+00	1.49E+01	6.31E+00	1.99E-01	1.50E+00	5.94E-01
T7 Tractor Construction	0.05%	0.01%	8.24E-02	1.16E+00	4.86E-01	1.56E-02	1.14E-01	4.55E-02
T7 Utility	0.00%	0.00%	2.72E-03	3.12E-02	1.60E-02	8.60E-04	6.05E-03	2.30E-03
T7IS	0.02%	0.01%	1.22E-01	1.31E+00	1.45E+01	8.08E-03	4.15E-02	1.62E-02
UBUS	0.15%	0.04%	2.23E-01	1.09E+01	3.59E+00	3.67E-02	1.84E+00	8.52E-01
TOTAL	100%	100%	137	366	4,070	16	401	164

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 3

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP	SAR GWP		
	2030	1,346,061,580	1	21	310	MTons	
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.02%	3.24E+02	4.31E-04	1.55E-01	0	325
LDA	62.15%	71.00%	1.52E+05	1.52E+00	2.16E+01	1	152,603
LDT1	3.41%	3.89%	1.07E+04	1.64E-01	2.22E+00	0	10,757
LDT2	18.01%	20.58%	6.43E+04	6.95E-01	9.96E+00	0	64,442
LHD1	1.19%	0.29%	2.05E+03	1.33E-02	1.95E+00	0	2,065
LHD2	0.51%	0.13%	9.15E+02	2.80E-03	3.05E-01	0	918
MCY	0.51%	0.59%	1.20E+03	3.10E+00	7.99E+00	0	1,346
MDV	10.12%	2.51%	1.07E+04	1.46E-01	2.10E+00	0	10,681
MH	0.07%	0.02%	2.25E+02	1.14E-03	1.44E-01	0	226
Motor Coach	0.04%	0.01%	2.00E+02	3.86E-04	9.86E-02	0	201
OBUS	0.10%	0.02%	3.45E+02	1.25E-03	3.17E-02	0	345
SBUS	0.06%	0.02%	1.87E+02	8.97E-04	2.31E-01	0	189
T6 Ag	0.00%	0.00%	1.83E+01	2.64E-05	1.34E-02	0	18
T6 CAIRP Heavy	0.00%	0.00%	7.45E+00	8.89E-06	2.57E-03	0	7
T6 CAIRP Small	0.01%	0.00%	2.34E+01	2.57E-05	6.85E-03	0	23
T6 Instate Construction Heavy	0.04%	0.01%	1.42E+02	1.87E-04	7.12E-02	0	143
T6 Instate Construction Small	0.09%	0.02%	3.29E+02	3.95E-04	1.20E-01	0	330
T6 Instate Heavy	0.27%	0.07%	9.92E+02	1.37E-03	5.53E-01	0	997
T6 Instate Small	0.69%	0.17%	2.55E+03	3.10E-03	9.66E-01	0	2,558
T6 OOS Heavy	0.00%	0.00%	4.27E+00	5.11E-06	1.48E-03	0	4
T6 OOS Small	0.00%	0.00%	1.34E+01	1.47E-05	3.93E-03	0	13
T6 Public	0.03%	0.01%	1.08E+02	1.23E-04	9.78E-02	0	109
T6 Utility	0.00%	0.00%	1.78E+01	1.62E-05	4.24E-03	0	18
T6TS	0.18%	0.04%	6.20E+02	2.80E-03	6.91E-02	0	620
T7 Ag	0.00%	0.00%	2.19E+01	5.32E-05	2.69E-02	0	22
T7 CAIRP	0.36%	0.09%	1.73E+03	3.95E-03	1.02E+00	0	1,743
T7 CAIRP Construction	0.03%	0.01%	1.31E+02	2.94E-04	7.32E-02	0	132
T7 NNOOS	0.45%	0.11%	2.13E+03	4.21E-03	9.35E-01	0	2,141
T7 NOOS	0.14%	0.04%	6.85E+02	1.56E-03	4.08E-01	0	689
T7 Other Port	0.07%	0.02%	3.31E+02	7.66E-04	1.85E-01	0	333
T7 POAK	0.21%	0.05%	1.04E+03	2.42E-03	5.92E-01	0	1,046
T7 Public	0.02%	0.00%	1.03E+02	2.29E-04	3.32E-01	0	107
T7 Single	0.13%	0.03%	6.77E+02	1.27E-03	4.29E-01	0	681
T7 Single Construction	0.07%	0.02%	3.47E+02	6.30E-04	1.85E-01	0	349
T7 SWCV	0.04%	0.01%	3.74E+02	1.47E-01	3.74E-01	0	380
T7 Tractor	0.68%	0.17%	3.28E+03	7.82E-03	2.34E+00	0	3,306
T7 Tractor Construction	0.05%	0.01%	2.58E+02	6.03E-04	1.82E-01	0	260
T7 Utility	0.00%	0.00%	1.42E+01	1.99E-05	4.92E-03	0	14
T7IS	0.02%	0.01%	1.24E+02	7.78E-03	2.06E-01	0	126
UBUS	0.15%	0.04%	6.75E+02	2.63E-02	1.71E+00	0	692
TOTAL	100%	100%	260,271	6	58	2	260,962

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x)

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 4

Based on EMFAC2014

Emission year	Daily							
2030	3,836,620		lbs/day					
	Percent of VMT	Adjust % VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	0.09%	0.02%	5.83E-02	9.74E-01	3.07E-01	1.94E-02	2.63E-01	1.12E-01
LDA	62.15%	71.00%	2.39E+01	1.36E+02	2.01E+03	9.58E+00	2.75E+02	1.12E+02
LDT1	3.41%	3.89%	2.55E+00	1.39E+01	1.79E+02	6.76E-01	1.51E+01	6.22E+00
LDT2	18.01%	20.58%	1.08E+01	6.26E+01	8.58E+02	4.05E+00	7.98E+01	3.27E+01
LHD1	1.19%	0.29%	8.29E-01	1.22E+01	7.70E+00	1.26E-01	2.33E+00	1.04E+00
LHD2	0.51%	0.13%	2.78E-01	1.92E+00	1.69E+00	5.58E-02	1.13E+00	5.01E-01
MCY	0.51%	0.59%	9.06E+01	5.02E+01	7.83E+02	9.10E-02	8.71E-01	3.84E-01
MDV	10.12%	2.51%	2.29E+00	1.32E+01	1.43E+02	6.70E-01	9.75E+00	4.00E+00
MH	0.07%	0.02%	2.90E-02	9.05E-01	5.51E-01	1.40E-02	2.08E-01	9.27E-02
Motor Coach	0.04%	0.01%	5.23E-02	6.20E-01	3.09E-01	1.20E-02	1.16E-01	5.04E-02
OBUS	0.10%	0.02%	1.94E-02	1.99E-01	5.41E-01	2.16E-02	2.96E-01	1.23E-01
SBUS	0.06%	0.02%	4.38E-02	1.45E+00	4.66E-01	1.13E-02	1.03E+00	4.45E-01
T6 Ag	0.00%	0.00%	3.58E-03	8.39E-02	1.88E-02	1.10E-03	1.46E-02	6.23E-03
T6 CAIRP Heavy	0.00%	0.00%	1.20E-03	1.61E-02	6.33E-03	4.47E-04	6.31E-03	2.67E-03
T6 CAIRP Small	0.01%	0.00%	3.48E-03	4.31E-02	1.83E-02	1.40E-03	1.93E-02	8.18E-03
T6 Instate Construction Heavy	0.04%	0.01%	2.53E-02	4.47E-01	1.33E-01	8.53E-03	1.16E-01	4.92E-02
T6 Instate Construction Small	0.09%	0.02%	5.34E-02	7.57E-01	2.81E-01	1.97E-02	2.70E-01	1.15E-01
T6 Instate Heavy	0.27%	0.07%	1.86E-01	3.48E+00	9.77E-01	5.94E-02	8.28E-01	3.53E-01
T6 Instate Small	0.69%	0.17%	4.20E-01	6.07E+00	2.21E+00	1.53E-01	2.09E+00	8.86E-01
T6 OOS Heavy	0.00%	0.00%	6.91E-04	9.31E-03	3.64E-03	2.56E-04	3.61E-03	1.53E-03
T6 OOS Small	0.00%	0.00%	1.99E-03	2.47E-02	1.05E-02	8.04E-04	1.11E-02	4.68E-03
T6 Public	0.03%	0.01%	1.66E-02	6.15E-01	7.75E-02	6.45E-03	8.93E-02	3.87E-02
T6 Utility	0.00%	0.00%	2.19E-03	2.66E-02	1.15E-02	1.07E-03	1.45E-02	6.12E-03
T6TS	0.18%	0.04%	4.35E-02	4.34E-01	1.31E+00	3.89E-02	5.31E-01	2.21E-01
T7 Ag	0.00%	0.00%	7.19E-03	1.69E-01	4.25E-02	1.32E-03	8.90E-03	3.58E-03
T7 CAIRP	0.36%	0.09%	5.34E-01	6.44E+00	3.15E+00	1.04E-01	7.88E-01	3.11E-01
T7 CAIRP Construction	0.03%	0.01%	3.98E-02	4.60E-01	2.35E-01	7.85E-03	5.83E-02	2.31E-02
T7 NNOOS	0.45%	0.11%	5.70E-01	5.87E+00	3.37E+00	1.28E-01	9.68E-01	3.77E-01
T7 NOOS	0.14%	0.04%	2.11E-01	2.56E+00	1.25E+00	4.10E-02	3.11E-01	1.23E-01
T7 Other Port	0.07%	0.02%	1.04E-01	1.16E+00	6.12E-01	1.99E-02	1.48E-01	5.88E-02
T7 POAK	0.21%	0.05%	3.28E-01	3.72E+00	1.94E+00	6.23E-02	4.64E-01	1.84E-01
T7 Public	0.02%	0.00%	3.09E-02	2.09E+00	1.41E-01	6.20E-03	4.95E-02	2.38E-02
T7 Single	0.13%	0.03%	1.72E-01	2.70E+00	1.02E+00	4.06E-02	2.85E-01	1.11E-01
T7 Single Construction	0.07%	0.02%	8.52E-02	1.16E+00	5.02E-01	2.08E-02	1.49E-01	5.80E-02
T7 SWCV	0.04%	0.01%	2.71E-02	2.35E+00	3.19E+00	7.74E-03	8.22E-02	3.20E-02
T7 Tractor	0.68%	0.17%	1.06E+00	1.47E+01	6.24E+00	1.97E-01	1.48E+00	5.88E-01
T7 Tractor Construction	0.05%	0.01%	8.15E-02	1.14E+00	4.81E-01	1.55E-02	1.13E-01	4.50E-02
T7 Utility	0.00%	0.00%	2.69E-03	3.09E-02	1.59E-02	8.51E-04	5.98E-03	2.28E-03
T7IS	0.02%	0.01%	1.21E-01	1.29E+00	1.44E+01	8.00E-03	4.11E-02	1.61E-02
UBUS	0.15%	0.04%	2.21E-01	1.07E+01	3.55E+00	3.63E-02	1.82E+00	8.43E-01
TOTAL	100%	100%	136	362	4,026	16	396	162

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Scenario 4

Based on EMFAC2014

	Emission year	Annual VMT	SAR GWP	SAR GWP		SAR GWP	
	2030	1,331,307,140	1	21		310	MTons
	Percent of VMT	Adjust % VMT	MT CO2	MT CH4	MT NOx	MT N ₂ O	MT CO2e
All Other Buses	0.09%	0.02%	3.20E+02	4.26E-04	1.53E-01	0	322
LDA	62.15%	71.00%	1.51E+05	1.50E+00	2.13E+01	1	150,931
LDT1	3.41%	3.89%	1.06E+04	1.62E-01	2.19E+00	0	10,639
LDT2	18.01%	20.58%	6.36E+04	6.87E-01	9.85E+00	0	63,736
LHD1	1.19%	0.29%	2.02E+03	1.32E-02	1.93E+00	0	2,042
LHD2	0.51%	0.13%	9.05E+02	2.77E-03	3.02E-01	0	908
MCY	0.51%	0.59%	1.19E+03	3.06E+00	7.90E+00	0	1,331
MDV	10.12%	2.51%	1.05E+04	1.44E-01	2.08E+00	0	10,564
MH	0.07%	0.02%	2.22E+02	1.13E-03	1.42E-01	0	224
Motor Coach	0.04%	0.01%	1.98E+02	3.82E-04	9.75E-02	0	199
OBUS	0.10%	0.02%	3.41E+02	1.23E-03	3.14E-02	0	342
SBUS	0.06%	0.02%	1.85E+02	8.87E-04	2.29E-01	0	187
T6 Ag	0.00%	0.00%	1.81E+01	2.61E-05	1.32E-02	0	18
T6 CAIRP Heavy	0.00%	0.00%	7.37E+00	8.79E-06	2.54E-03	0	7
T6 CAIRP Small	0.01%	0.00%	2.32E+01	2.54E-05	6.78E-03	0	23
T6 Instate Construction Heavy	0.04%	0.01%	1.41E+02	1.85E-04	7.04E-02	0	141
T6 Instate Construction Small	0.09%	0.02%	3.25E+02	3.91E-04	1.19E-01	0	326
T6 Instate Heavy	0.27%	0.07%	9.81E+02	1.36E-03	5.47E-01	0	986
T6 Instate Small	0.69%	0.17%	2.52E+03	3.07E-03	9.56E-01	0	2,530
T6 OOS Heavy	0.00%	0.00%	4.22E+00	5.05E-06	1.46E-03	0	4
T6 OOS Small	0.00%	0.00%	1.33E+01	1.46E-05	3.88E-03	0	13
T6 Public	0.03%	0.01%	1.06E+02	1.21E-04	9.67E-02	0	107
T6 Utility	0.00%	0.00%	1.76E+01	1.60E-05	4.19E-03	0	18
T6TS	0.18%	0.04%	6.13E+02	2.76E-03	6.83E-02	0	613
T7 Ag	0.00%	0.00%	2.17E+01	5.26E-05	2.66E-02	0	22
T7 CAIRP	0.36%	0.09%	1.71E+03	3.90E-03	1.01E+00	0	1,724
T7 CAIRP Construction	0.03%	0.01%	1.30E+02	2.91E-04	7.24E-02	0	130
T7 NNOOS	0.45%	0.11%	2.11E+03	4.17E-03	9.25E-01	0	2,118
T7 NOOS	0.14%	0.04%	6.77E+02	1.54E-03	4.03E-01	0	681
T7 Other Port	0.07%	0.02%	3.28E+02	7.58E-04	1.83E-01	0	329
T7 POAK	0.21%	0.05%	1.03E+03	2.40E-03	5.85E-01	0	1,034
T7 Public	0.02%	0.00%	1.02E+02	2.26E-04	3.28E-01	0	106
T7 Single	0.13%	0.03%	6.70E+02	1.26E-03	4.25E-01	0	674
T7 Single Construction	0.07%	0.02%	3.44E+02	6.23E-04	1.83E-01	0	345
T7 SWCV	0.04%	0.01%	3.70E+02	1.45E-01	3.70E-01	0	376
T7 Tractor	0.68%	0.17%	3.25E+03	7.73E-03	2.32E+00	0	3,270
T7 Tractor Construction	0.05%	0.01%	2.55E+02	5.96E-04	1.80E-01	0	257
T7 Utility	0.00%	0.00%	1.40E+01	1.96E-05	4.86E-03	0	14
T7IS	0.02%	0.01%	1.22E+02	7.69E-03	2.04E-01	0	125
UBUS	0.15%	0.04%	6.67E+02	2.61E-02	1.69E+00	0	685
TOTAL	100%	100%	257,418	6	57	2	258,102

N₂O emissions were calculated using an off-model adjustment provided by CARB in AB 32 Technical Appendices. The off-model adjustment uses a linear regression correlating N₂O with NO_x (N₂O = 0.0167 + 0.0318 x NO_x).

Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

Based on the emission factors for Santa Clara County - San Francisco Bay Area Air Basin. % VMT based on EMFAC2014-PL for Santa Clara County.

Area Sources – Consumer Products & Offroad Equipment

Area Sources - Consumer Products

Source: CalEEMod Users Guide. Version 2013.2.2.

Residential Consumer Product Use

Emissions = EF x Building Area

SCAQMD EF = 2.04E-05 lbs/sqft/day

AVERAGE HOUSING SQFT ASSUMPTIONS

Year Structure was Built	Percent of Housing Stock ⁽¹⁾	Average Square Feet of New Single Family Homes ⁽²⁾		Average Square Feet (Weighted)
2010 or later	0.4%	2,494		11
2000 to 2009	9.6%	2,404		232
1990 to 1999	5.3%	2,116		111
1980 to 1989	8.5%	1,819		155
1979 or earlier	76.2%	1,699		1,294
				1,803

Sources/Notes:

(1) United States Census Bureau, American FactFinder, City of Palo Alto, Santa Clara County, California, Physical Housing Characteristics for Occupied Housing Units, 2012 American Community Survey 3-Year Estimates, Year structure built.

(2) United States Census Bureau, Characteristics of New Housing, Characteristics of New Single-Family Houses Completed, Median and Average Square Feet by Location. Obtained from <http://www.census.gov/construction/chars/>

	City	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Housing Units	28,545	31,265	31,265	32,090	32,965
Residential SQFT	51,456,217	58,536,377	58,536,377	60,683,852	62,961,477
lbs VOC per day	1,050	1,194	1,194	1,238	1,284

Source

1 New housing units constructed post-2014 assumed to be 2,603 square feet.

Area Sources - Criteria Air Pollutants

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM ₁₀ Exhaust	PM _{2.5} Exhaust*
CEQA Baseline 2014	Proportioned Based on:	lbs/day					
Construction Equipment	The percentage of building permits issued in Palo Alto compared to Santa Clara County.	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	The percentage of residential units in Palo Alto compared to Santa Clara County.	146	38	1,878	0	5	5
Light Commercial Equipment	The percentage of employment in Palo Alto compared to San Santa Clara County.	136	270	3,949	0	29	29
TOTAL		451	1,420	6,998	2	103	102

* assumes PM2.5 is 99 percent of PM10

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 1	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	161	42	2,066	0	6	6
Light Commercial Equipment	Proportional to employment growth	158	314	4,589	1	34	34
TOTAL		488	1,468	7,827	2	108	107

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 2	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	161	42	2,066	0	6	6
Light Commercial Equipment	Proportional to employment growth	150	298	4,356	0	33	32
TOTAL		480	1,452	7,594	2	107	106

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 3	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	165	43	2,119	0	6	6
Light Commercial Equipment	Proportional to employment growth	155	306	4,476	1	33	33
TOTAL		488	1,461	7,766	2	108	107

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 4	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	169	44	2,177	0	6	6
Light Commercial Equipment	Proportional to employment growth	158	314	4,589	1	34	34
TOTAL		496	1,470	7,937	2	109	108

Sources

Building Permits

Source: U.S. Census Bureau

<http://censtats.census.gov/bldg/bldgprmt.shtml>**Employment**Source: U.S. Census Bureau. Longitudinal Employer-Household Dynamics. <http://lehd.ces.census.gov/>**Population**

Source: U.S. Census Bureau.

Other Emissions Sources - Off-road Equipment

Source: OFFROAD2007. Based on equipment use in Santa Clara.

Year 2014 BAU	Proportioned Based on:	MTCO ₂ e
Construction Equipment	The percentage of building permits issued in Palo Alto compared to Santa Clara County.	21,831
Lawn & Garden Equipment	The percentage of residential units in Palo Alto compared to Santa Clara County.	1,190
Light Commercial Equipment	The percentage of employment in Palo Alto compared to Santa Clara County.	5,943
TOTAL		28,964

		MTCO ₂ e				
Scenario 1	Forecast Adjusted for:	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 2020
Construction Equipment	Annual assumed to be similar to historic	21,831	21,831	21,831	21,831	21,831
Lawn & Garden Equipment	Proportional to population growth	1,310	1,310	1,343	1,380	1,277
Light Commercial Equipment	Proportional to employment growth	6,907	6,557	6,738	6,907	6,526
TOTAL		30,048	29,697	29,911	30,118	29,634

Adjusted Business as Usual - Low Carbon Fuel Standard

		MTCO ₂ e				
Scenario 1	Notes	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 2020
Construction Equipment	With LCFS (10% reduction)	19,648	19,648	19,648	19,648	19,648
Lawn&Garden Equipment	With LCFS (10% reduction)	1,179	1,179	1,209	1,242	1,150
Light Commercial Equipment	With LCFS (10% reduction)	6,216	5,901	6,064	6,216	5,874
TOTAL		27,043	26,728	26,920	27,106	26,671
reduction		3,005	2,970	2,991	3,012	2,963

Note- the newer OFFROAD2011 Model does not provide emissions by County

Area Sources - Consumer Products

Source: CalEEMod Users Guide. Version 2013.2.2.

Residential Consumer Product Use

Emissions = EF x Building Area

SCAQMD EF = 2.04E-05 lbs/sqft/day

AVERAGE HOUSING SQFT ASSUMPTIONS

Year Structure was Built	Percent of Housing Stock ⁽¹⁾	Average Square Feet of New Single Family Homes ⁽²⁾	Average Square Feet (Weighted)
2010 or later	0.4%	2,494	11
2000 to 2009	9.6%	2,404	232
1990 to 1999	5.3%	2,116	111
1980 to 1989	8.5%	1,819	155
1979 or earlier	76.2%	1,699	1,294
			1,803

Sources/Notes:

(1) United States Census Bureau, American FactFinder, City of Palo Alto, Santa Clara County, California, Physical Housing Characteristics for Occupied Housing Units, 2012 American Community Survey 3-Year Estimates, Year structure built.

(2) United States Census Bureau, Characteristics of New Housing, Characteristics of New Single-Family Houses Completed, Median and Average Square Feet by Location. Obtained from <http://www.census.gov/construction/chars/>

	SOI + City	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Housing Units	33,070	36,950	36,950	37,780	38,650
Residential SQFT	59,613,140	69,712,780	69,712,780	71,873,270	74,137,880
lbs VOC per day	1,216	1,422	1,422	1,466	1,512

Source

1 New housing units constructed post-2014 assumed to be 2,603 square feet.

Area Sources - Criteria Air Pollutants

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM ₁₀ Exhaust	PM _{2.5} Exhaust*
CEQA Baseline 2014	Proportioned Based on:	lbs/day					
Construction Equipment	The percentage of building permits issued in Palo Alto compared to Santa Clara County.	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	The percentage of residential units in Palo Alto compared to Santa Clara County.	180	47	2,310	0	6	6
Light Commercial Equipment	The percentage of employment in Palo Alto compared to San Santa Clara County.	144	285	4,171	0	31	31
TOTAL		492	1,444	7,652	2	106	105

* assumes PM2.5 is 99 percent of PM10

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 1	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	201	52	2,579	0	7	7
Light Commercial Equipment	Proportional to employment growth	167	330	4,827	1	36	36
TOTAL		536	1,495	8,577	2	112	110

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 2	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	201	52	2,579	0	7	7
Light Commercial Equipment	Proportional to employment growth	159	314	4,594	1	34	34
TOTAL		528	1,479	8,345	2	110	109

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 3	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	205	53	2,631	0	7	7
Light Commercial Equipment	Proportional to employment growth	163	322	4,714	1	35	35
TOTAL		536	1,488	8,517	2	111	110

		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM10 Exhaust	PM2.5 Exhaust*
Scenario 4	Forecast Adjusted for:	lbs/day					
Construction Equipment	Annual assumed to be similar to historic	169	1,112	1,171	2	68	68
Lawn & Garden Equipment	Proportional to population growth	209	55	2,689	0	7	7
Light Commercial Equipment	Proportional to employment growth	167	330	4,827	1	36	36
TOTAL		545	1,497	8,688	2	112	111

Sources

Building Permits

Source: U.S. Census Bureau

<http://censtats.census.gov/bldg/bldgprmt.shtml>**Employment**Source: U.S. Census Bureau. Longitudinal Employer-Household Dynamics. <http://lehd.ces.census.gov/>**Population**

Source: U.S. Census Bureau.

Other Emissions Sources - Off-road Equipment

Source: OFFROAD2007. Based on equipment use in Santa Clara.

Year 2014 BAU	Proportioned Based on:	MTCO ₂ e
Construction Equipment	The percentage of building permits issued in Palo Alto compared to Santa Clara County.	21,831
Lawn & Garden Equipment	The percentage of residential units in Palo Alto compared to Santa Clara County.	1,464
Light Commercial Equipment	The percentage of employment in Palo Alto compared to Santa Clara County.	6,278
TOTAL		29,573

		MTCO ₂ e				
Scenario 1	Forecast Adjusted for:	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 2020
Construction Equipment	Annual assumed to be similar to historic	21,831	21,831	21,831	21,831	21,831
Lawn & Garden Equipment	Proportional to population growth	1,634	1,634	1,668	1,704	1,605
Light Commercial Equipment	Proportional to employment growth	7,266	6,915	7,096	7,266	6,877
TOTAL		30,731	30,381	30,595	30,801	30,313

Adjusted Business as Usual - Low Carbon Fuel Standard

		MTCO ₂ e				
Scenario 1	Notes	Scenario 1	Scenario 2	Scenario 3	Scenario 4	AB 32 2020
Construction Equipment	With LCFS (10% reduction)	19,648	19,648	19,648	19,648	19,648
Lawn&Garden Equipment	With LCFS (10% reduction)	1,471	1,471	1,501	1,534	1,445
Light Commercial Equipment	With LCFS (10% reduction)	6,539	6,224	6,387	6,539	6,189
TOTAL		27,658	27,343	27,535	27,721	27,282
reduction		3,073	3,038	3,059	3,080	3,031

Note- the newer OFFROAD2011 Model does not provide emissions by County

Construction

Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e
Tampers/Rammers	Santa Clara	SF	BA	1.79E+02	8.91E+01	1.80E+01	1.13E-03	8.73E-04	4.86E-02	3.82E-06	7.78E-04	9.28E-02	1.39E-04	7.03E-05	1.37E-01	43
Plate Compactors	Santa Clara	SF	BA	1.53E+01	8.66E+00	1.75E+00	1.10E-04	8.47E-05	4.72E-03	3.71E-07	7.56E-05	9.01E-03	1.34E-05	6.81E-06	1.33E-02	4
Asphalt Pavers	Santa Clara	SF	BA	3.90E+00	4.23E+00	2.49E+00	1.89E-04	1.38E-04	7.23E-03	3.39E-07	9.97E-05	1.19E-02	1.21E-05	1.05E-05	1.59E-02	5
Asphalt Pavers	Santa Clara	SF	BA	6.66E+00	7.23E+00	1.07E+01	8.36E-04	5.34E-04	3.21E-02	1.26E-06	4.17E-04	4.97E-02	3.20E-05	4.62E-05	6.06E-02	19
Asphalt Pavers	Santa Clara	SF	BA	3.31E+00	3.56E+00	8.29E+00	2.58E-04	3.69E-04	8.97E-03	7.89E-07	4.97E-06	6.49E-02	1.74E-05	1.43E-05	7.06E-02	22
Asphalt Pavers	Santa Clara	SF	BA	1.82E+00	1.96E+00	7.59E+00	1.68E-04	4.81E-04	3.44E-03	6.49E-07	5.21E-06	6.72E-02	1.41E-05	9.30E-06	7.18E-02	23
Tampers/Rammers	Santa Clara	SF	BA	8.24E+00	4.11E+00	2.02E+00	1.53E-04	1.10E-04	5.87E-03	2.75E-07	8.08E-05	9.64E-03	1.06E-05	8.46E-06	1.31E-02	4
Plate Compactors	Santa Clara	SF	BA	3.03E+02	1.49E+02	2.74E+01	3.91E-03	1.73E-03	5.99E-02	5.37E-06	5.07E-05	1.56E-01	2.46E-04	2.16E-04	2.36E-01	74
Plate Compactors	Santa Clara	SF	BA	3.21E+02	1.81E+02	7.88E+01	5.94E-03	4.34E-03	2.30E-01	1.08E-05	3.17E-03	3.78E-01	4.39E-04	3.29E-04	5.21E-01	164
Rollers	Santa Clara	SF	BA	3.37E+01	7.67E+00	2.10E+00	2.54E-04	1.12E-04	5.12E-03	3.89E-07	3.67E-06	1.13E-02	1.43E-05	1.41E-05	1.60E-02	5
Rollers	Santa Clara	SF	BA	5.45E+01	4.64E+01	2.56E+01	1.93E-03	1.41E-03	7.44E-02	3.49E-06	1.03E-03	1.22E-01	1.28E-04	1.07E-04	1.64E-01	52
Rollers	Santa Clara	SF	BA	3.68E+01	3.13E+01	3.76E+01	2.90E-03	1.85E-03	1.13E-01	4.42E-06	1.46E-03	1.74E-01	1.23E-04	1.61E-04	2.16E-01	68
Rollers	Santa Clara	SF	BA	2.33E+00	3.97E+00	1.07E+01	4.58E-04	5.60E-04	1.46E-02	9.56E-07	6.03E-06	7.87E-02	2.34E-05	2.53E-05	8.64E-02	27
Rollers	Santa Clara	SF	BA	4.38E+00	7.47E+00	3.46E+01	1.12E-03	2.68E-03	2.13E-02	2.86E-06	2.30E-05	2.96E-01	6.86E-05	6.21E-05	3.19E-01	100
Paving Equipment	Santa Clara	SF	BA	4.23E+02	1.97E+02	3.90E+01	5.50E-03	2.44E-03	8.61E-02	7.62E-06	7.19E-05	2.21E-01	3.36E-04	3.04E-04	3.31E-01	104
Paving Equipment	Santa Clara	SF	BA	7.16E+02	3.93E+02	2.29E+02	1.72E-02	1.26E-02	6.67E-01	3.13E-05	9.20E-03	1.10E+00	1.11E-03	9.53E-04	1.46E+00	460
Paving Equipment	Santa Clara	SF	BA	1.59E+01	8.73E+00	1.15E+01	8.89E-04	5.68E-04	3.46E-02	1.36E-06	4.50E-04	5.36E-02	3.61E-05	4.92E-05	6.59E-02	21
Paving Equipment	Santa Clara	SF	BA	9.05E+00	4.34E+00	9.78E+00	1.66E-04	2.72E-04	7.59E-03	9.95E-07	6.27E-06	8.18E-02	1.63E-05	9.17E-06	8.71E-02	27
Paving Equipment	Santa Clara	SF	BA	2.33E+00	1.12E+00	4.04E+00	4.04E-05	1.33E-04	1.07E-03	3.59E-07	2.88E-06	3.72E-02	5.29E-06	2.24E-06	3.89E-02	12
Surfacing Equipment	Santa Clara	SF	BA	7.77E+01	4.26E+01	8.64E+00	1.26E-03	5.58E-04	1.86E-02	1.71E-06	1.61E-05	4.94E-02	7.49E-05	6.98E-05	7.41E-02	23
Surfacing Equipment	Santa Clara	SF	BA	2.31E+02	3.19E+02	1.24E+02	9.78E-03	7.14E-03	3.60E-01	1.69E-05	4.96E-03	5.91E-01	7.46E-04	5.41E-04	8.34E-01	262
Surfacing Equipment	Santa Clara	SF	BA	3.16E+00	4.36E+00	4.15E+00	3.36E-04	2.14E-04	1.24E-02	4.87E-07	1.61E-04	1.92E-02	1.55E-05	1.86E-05	2.44E-02	8
Signal Boards	Santa Clara	SF	BA	9.60E-01	3.42E-01	1.12E-01	1.45E-05	6.43E-06	2.63E-04	2.13E-08	2.01E-07	6.15E-04	7.28E-07	8.04E-07	8.58E-04	0
Signal Boards	Santa Clara	SF	BA	6.83E+00	5.32E+00	3.20E+00	2.39E-04	1.75E-04	9.31E-03	4.37E-07	1.28E-04	1.53E-02	1.53E-05	1.33E-05	2.03E-02	6
Trenchers	Santa Clara	SF	BA	6.32E+01	7.52E+01	4.91E+01	3.79E-03	2.77E-03	1.43E-01	6.70E-06	1.97E-03	2.35E-01	2.29E-04	2.10E-04	3.10E-01	98
Trenchers	Santa Clara	SF	BA	4.89E+01	5.83E+01	8.24E+01	6.52E-03	4.16E-03	2.47E-01	9.69E-06	3.20E-03	3.82E-01	2.53E-04	3.60E-04	4.68E-01	147
Trenchers	Santa Clara	SF	BA	2.12E+01	2.34E+01	5.20E+01	1.91E-03	2.67E-03	6.04E-02	4.86E-06	3.06E-05	4.00E-01	1.22E-04	1.06E-04	4.40E-01	139
Trenchers	Santa Clara	SF	BA	7.04E+00	7.76E+00	3.30E+01	8.95E-04	2.51E-03	1.70E-02	2.79E-06	2.24E-05	2.89E-01	6.67E-05	4.95E-05	3.10E-01	98
Bore/Drill Rigs	Santa Clara	SF	BA	1.81E+00	6.14E-01	4.80E-01	3.52E-05	2.54E-05	1.40E-03	6.55E-08	1.93E-05	2.30E-03	1.99E-06	1.95E-06	2.96E-03	1
Bore/Drill Rigs	Santa Clara	SF	BA	8.98E+00	3.05E+00	4.42E+00	3.31E-04	2.10E-04	1.33E-02	5.21E-07	1.72E-04	2.05E-02	1.30E-05	1.84E-05	2.50E-02	8
Bore/Drill Rigs	Santa Clara	SF	BA	1.03E+00	3.01E-01	8.02E-01	2.23E-05	3.97E-05	6.89E-04	7.99E-08	5.03E-07	6.57E-03	1.67E-06	1.23E-06	7.12E-03	2
Bore/Drill Rigs	Santa Clara	SF	BA	4.71E+00	1.38E+00	9.12E+00	1.78E-04	6.76E-04	3.39E-03	7.93E-07	6.36E-06	8.20E-02	1.45E-05	9.88E-06	8.67E-02	27
Bore/Drill Rigs	Santa Clara	SF	BA	1.17E+00	3.42E-01	3.10E+00	3.56E-05	2.64E-04	9.36E-04	2.81E-07	2.25E-06	2.83E-02	4.58E-06	1.97E-06	2.97E-02	9
Concrete/Industrial Saws	Santa Clara	SF	BA	3.31E+01	1.18E+01	3.18E+00	4.11E-04	1.82E-04	7.45E-03	6.03E-07	5.69E-06	1.74E-02	2.26E-05	2.28E-05	2.49E-02	8
Concrete/Industrial Saws	Santa Clara	SF	BA	1.49E+02	1.27E+02	8.79E+01	6.63E-03	4.84E-03	2.56E-01	1.20E-05	3.53E-03	4.21E-01	3.94E-04	3.67E-04	5.51E-01	173
Concrete/Industrial Saws	Santa Clara	SF	BA	4.66E+01	3.96E+01	5.36E+01	4.14E-03	2.64E-03	1.61E-01	6.31E-06	2.09E-03	2.49E-01	1.66E-04	2.29E-04	3.05E-01	96
Concrete/Industrial Saws	Santa Clara	SF	BA	3.82E+00	6.40E+00	1.78E+01	1.90E-04	2.74E-04	1.29E-02	1.83E-06	1.16E-05	1.51E-01	2.12E-05	1.05E-05	1.58E-01	50
Concrete/Industrial Saws	Santa Clara	SF	BA	2.19E+00	3.67E+00	1.73E+01	7.79E-05	1.76E-04	3.51E-03	1.56E-06	1.25E-05	1.61E-01	1.28E-05	4.31E-06	1.65E-01	52
Cement and Mortar Mixers	Santa Clara	SF	BA	6.02E+02	1.52E+02	3.91E+01	4.91E-03	2.17E-03	9.31E-02	7.32E-06	6.91E-05	2.12E-01	2.79E-04	2.72E-04	3.04E-01	96
Cement and Mortar Mixers	Santa Clara	SF	BA	1.02E+03	2.57E+02	1.25E+02	1.12E-02	5.93E-03	3.77E-01	1.64E-05	4.76E-03	5.75E-01	6.09E-04	6.20E-04	7.76E-01	244
Cement and Mortar Mixers	Santa Clara	SF	BA	4.29E+00	1.08E+00	1.67E+00	1.45E-04	7.11E-05	5.12E-03	1.92E-07	6.25E-05	7.56E-03	4.47E-06	8.00E-06	9.11E-03	3
Cranes	Santa Clara	SF	BA	1.17E+00	1.33E+00	2.60E+00	9.66E-05	1.33E-04	3.05E-03	2.42E-07	1.53E-06	1.99E-02	6.48E-06	5.34E-06	2.20E-02	7
Cranes	Santa Clara	SF	BA	2.33E+00	2.65E+00	9.03E+00	2.47E-04	6.88E-04	4.70E-03	7.61E-07	6.10E-06	7.88E-02	2.03E-05	1.37E-05	8.54E-02	27
Cranes	Santa Clara	SF	BA	9.33E-02	1.06E-01	5.71E-01	8.03E-06	5.23E-05	1.92E-04	5.14E-08	4.12E-07	5.18E-03	1.14E-06	4.44E-07	5.54E-03	2
Crushing/Proc. Equipment	Santa Clara	SF	BA	1.64E+00	1.30E+00	9.81E-01	7.36E-05	5.37E-05	2.86E-03	1.34E-07	3.94E-05	4.70E-03	4.21E-06	4.07E-06	6.09E-03	2
Crushing/Proc. Equipment	Santa Clara	SF	BA	1.07E+00	8.50E-01	1.18E+00	9.05E-05	5.78E-05	3.53E-03	1.39E-07	4.59E-05	5.47E-03	3.60E-06	5.01E-06	6.69E-03	2
Crushing/Proc. Equipment	Santa Clara	SF	BA	1.35E+00	8.94E-01	7.02E+00	1.62E-04	5.26E-04	3.07E-03	6.02E-07	4.82E-06	6.23E-02	1.05E-05	8.94E-06	6.57E-02	21

Construction

Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e
Rough Terrain Forklifts	Santa Clara	SF	BA	4.66E-01	5.28E-01	1.76E+00	6.53E-05	9.03E-05	2.06E-03	1.64E-07	1.03E-06	1.35E-02	3.43E-06	3.61E-06	1.46E-02	5
Rough Terrain Forklifts	Santa Clara	SF	BA	6.62E+00	7.50E+00	3.93E+01	1.07E-03	2.99E-03	2.04E-02	3.31E-06	2.66E-05	3.43E-01	7.21E-05	5.95E-05	3.66E-01	115
Rough Terrain Forklifts	Santa Clara	SF	BA	2.33E-01	2.64E-01	2.16E+00	3.04E-05	1.98E-04	7.26E-04	1.95E-07	1.56E-06	1.96E-02	3.55E-06	1.68E-06	2.08E-02	7
Rubber Tired Loaders	Santa Clara	SF	BA	1.17E+00	1.64E+00	4.03E+00	1.49E-04	1.97E-04	4.94E-03	3.71E-07	2.34E-06	3.05E-02	8.77E-06	8.25E-06	3.34E-02	11
Rubber Tired Loaders	Santa Clara	SF	BA	7.74E+00	1.09E+01	4.15E+01	1.13E-03	2.95E-03	2.22E-02	3.49E-06	2.80E-05	3.61E-01	8.43E-05	6.26E-05	3.88E-01	122
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	4.10E+00	9.79E+00	2.88E+01	4.34E-04	9.97E-04	1.51E-02	2.44E-06	1.96E-05	2.53E-01	4.55E-05	2.39E-05	2.67E-01	84
Skid Steer Loaders	Santa Clara	SF	BA	3.22E+00	2.81E+00	2.26E+00	1.73E-04	1.26E-04	6.58E-03	3.09E-07	9.07E-05	1.08E-02	9.53E-06	9.56E-06	1.40E-02	4
Skid Steer Loaders	Santa Clara	SF	BA	2.15E+02	1.88E+02	2.11E+02	1.66E-02	1.06E-02	6.33E-01	2.49E-05	8.23E-03	9.82E-01	7.19E-04	9.16E-04	1.22E+00	385
Skid Steer Loaders	Santa Clara	SF	BA	3.18E+01	2.70E+01	5.19E+01	6.26E-04	9.35E-04	4.16E-02	5.27E-06	3.32E-05	4.33E-01	7.80E-05	3.46E-05	4.58E-01	144
Skid Steer Loaders	Santa Clara	SF	BA	1.90E+01	1.62E+01	6.92E+01	3.87E-04	1.01E-03	1.64E-02	6.19E-06	4.96E-05	6.41E-01	6.10E-05	2.15E-05	6.60E-01	208
Dumpers/Tenders	Santa Clara	SF	BA	3.07E+01	1.25E+01	1.71E+00	2.47E-04	1.09E-04	3.68E-03	3.36E-07	3.18E-06	9.74E-03	1.77E-05	1.37E-05	1.55E-02	5
Dumpers/Tenders	Santa Clara	SF	BA	6.55E+01	2.68E+01	1.01E+01	8.78E-04	5.11E-04	3.00E-02	1.33E-06	3.88E-04	4.67E-02	5.74E-05	4.86E-05	6.55E-02	21
Dumpers/Tenders	Santa Clara	SF	BA	1.21E+01	4.96E+00	4.02E+00	3.44E-04	1.83E-04	1.22E-02	4.64E-07	1.52E-04	1.83E-02	1.51E-05	1.90E-05	2.34E-02	7
Dumpers/Tenders	Santa Clara	SF	BA	8.40E-01	2.92E-01	7.53E-01	1.51E-05	5.59E-05	2.87E-04	6.53E-08	5.23E-07	6.75E-03	1.86E-06	8.37E-07	7.35E-03	2
Other Construction Equipment	Santa Clara	SF	BA	3.26E+00	3.32E+00	1.82E+01	7.39E-05	2.41E-04	5.66E-03	1.66E-06	1.33E-05	1.67E-01	1.42E-05	4.09E-06	1.71E-01	54
Pavers	Santa Clara	SF	BA	8.90E-01	2.00E+00	1.70E+00	2.39E-05	1.47E-04	7.89E-05	2.37E-07	7.02E-06	1.87E-02	0.00E+00	2.16E-06	1.87E-02	6
Pavers	Santa Clara	SF	BA	5.17E+01	1.18E+02	1.55E+02	7.56E-03	1.69E-02	2.07E-02	2.14E-05	1.71E-03	1.65E+00	0.00E+00	6.82E-04	1.67E+00	525
Pavers	Santa Clara	SF	BA	6.10E+01	1.39E+02	4.42E+02	9.12E-03	5.53E-02	3.49E-02	5.65E-05	4.74E-03	4.82E+00	0.00E+00	8.22E-04	4.83E+00	1,521
Pavers	Santa Clara	SF	BA	3.79E+01	8.66E+01	5.07E+02	7.33E-03	5.66E-02	3.35E-02	6.24E-05	3.11E-03	5.55E+00	0.00E+00	6.61E-04	5.56E+00	1,751
Pavers	Santa Clara	SF	BA	4.57E+00	1.04E+01	9.20E+01	1.02E-03	9.42E-03	3.04E-03	1.14E-05	3.63E-04	1.01E+00	0.00E+00	9.23E-05	1.02E+00	320
Pavers	Santa Clara	SF	BA	4.69E+00	1.07E+01	1.13E+02	1.16E-03	1.05E-02	4.63E-03	1.22E-05	4.04E-04	1.25E+00	0.00E+00	1.04E-04	1.25E+00	393
Plate Compactors	Santa Clara	SF	BA	1.91E+01	3.14E+01	6.19E+00	7.89E-05	4.94E-04	4.14E-04	1.05E-06	1.92E-05	6.77E-02	0.00E+00	7.12E-06	6.79E-02	21
Rollers	Santa Clara	SF	BA	3.59E+01	6.84E+01	1.97E+01	2.51E-04	1.57E-03	1.32E-03	3.36E-06	6.14E-05	2.16E-01	0.00E+00	2.27E-05	2.16E-01	68
Rollers	Santa Clara	SF	BA	1.50E+01	2.86E+01	1.74E+01	2.30E-04	1.46E-03	7.85E-04	2.42E-06	5.68E-05	1.91E-01	0.00E+00	2.08E-05	1.91E-01	60
Rollers	Santa Clara	SF	BA	4.67E+01	8.98E+01	1.08E+02	4.25E-03	1.12E-02	1.27E-02	1.51E-05	1.02E-03	1.17E+00	0.00E+00	3.83E-04	1.17E+00	370
Rollers	Santa Clara	SF	BA	2.51E+02	4.82E+02	1.30E+03	2.22E-02	1.42E-01	9.71E-02	1.67E-04	1.19E-02	1.42E+01	0.00E+00	2.00E-03	1.43E+01	4,488
Rollers	Santa Clara	SF	BA	1.01E+02	1.94E+02	9.56E+02	1.14E-02	9.24E-02	5.99E-02	1.18E-04	4.94E-03	1.05E+01	0.00E+00	1.03E-03	1.05E+01	3,306
Rollers	Santa Clara	SF	BA	1.43E+01	2.75E+01	1.91E+02	1.62E-03	1.65E-02	5.11E-03	2.37E-05	5.60E-04	2.10E+00	0.00E+00	1.46E-04	2.11E+00	663
Rollers	Santa Clara	SF	BA	1.00E+01	1.93E+01	1.92E+02	1.50E-03	1.48E-02	5.71E-03	2.07E-05	5.18E-04	2.11E+00	0.00E+00	1.35E-04	2.11E+00	666
Scrapers	Santa Clara	SF	BA	2.31E+00	7.05E+00	3.04E+01	6.23E-04	3.72E-03	2.42E-03	3.88E-06	3.21E-04	3.31E-01	0.00E+00	5.62E-05	3.32E-01	104
Scrapers	Santa Clara	SF	BA	2.12E+01	6.45E+01	4.36E+02	6.36E-03	4.75E-02	2.92E-02	5.37E-05	2.65E-03	4.77E+00	0.00E+00	5.74E-04	4.79E+00	1,507
Scrapers	Santa Clara	SF	BA	2.07E+01	6.29E+01	5.98E+02	6.71E-03	5.95E-02	1.93E-02	7.41E-05	2.28E-03	6.58E+00	0.00E+00	6.06E-04	6.60E+00	2,076
Scrapers	Santa Clara	SF	BA	5.68E+01	1.73E+02	2.53E+03	2.62E-02	2.26E-01	9.83E-02	2.73E-04	8.76E-03	2.78E+01	0.00E+00	2.37E-03	2.79E+01	8,770
Scrapers	Santa Clara	SF	BA	1.08E+00	3.29E+00	8.30E+01	8.65E-04	7.57E-03	3.23E-03	9.18E-06	2.91E-04	9.13E-01	0.00E+00	7.81E-05	9.15E-01	288
Paving Equipment	Santa Clara	SF	BA	1.54E+00	3.51E+00	2.02E+00	2.67E-05	1.69E-04	9.11E-05	2.81E-07	6.59E-06	2.21E-02	0.00E+00	2.41E-06	2.22E-02	7
Paving Equipment	Santa Clara	SF	BA	1.31E+00	2.99E+00	3.35E+00	1.63E-04	3.65E-04	4.44E-04	4.62E-07	3.69E-05	3.58E-02	0.00E+00	1.47E-05	3.61E-02	11
Paving Equipment	Santa Clara	SF	BA	1.88E+01	4.31E+01	1.08E+02	2.21E-03	1.34E-02	8.45E-03	1.38E-05	1.16E-03	1.17E+00	0.00E+00	2.00E-04	1.18E+00	371
Paving Equipment	Santa Clara	SF	BA	8.84E+00	2.03E+01	9.35E+01	1.34E-03	1.04E-02	6.12E-03	1.15E-05	5.71E-04	1.02E+00	0.00E+00	1.21E-04	1.03E+00	323
Paving Equipment	Santa Clara	SF	BA	2.49E+00	5.71E+00	3.17E+01	3.44E-04	3.23E-03	1.03E-03	3.93E-06	1.23E-04	3.49E-01	0.00E+00	3.11E-05	3.50E-01	110
Surfacing Equipment	Santa Clara	SF	BA	1.19E+00	1.47E+00	9.61E-01	3.25E-05	9.64E-05	1.01E-04	1.34E-07	8.07E-06	1.04E-02	0.00E+00	2.93E-06	1.04E-02	3
Surfacing Equipment	Santa Clara	SF	BA	2.37E-01	2.95E-01	8.59E-01	1.33E-05	9.08E-05	6.15E-05	1.10E-07	7.02E-06	9.38E-03	0.00E+00	1.20E-06	9.41E-03	3
Surfacing Equipment	Santa Clara	SF	BA	1.78E-01	2.21E-01	8.63E-01	9.28E-06	8.07E-05	5.21E-05	1.07E-07	4.00E-06	9.47E-03	0.00E+00	8.38E-07	9.49E-03	3
Surfacing Equipment	Santa Clara	SF	BA	3.56E-01	4.42E-01	2.70E+00	2.11E-05	2.26E-04	7.15E-05	3.35E-07	7.53E-06	2.98E-02	0.00E+00	1.90E-06	2.98E-02	9
Surfacing Equipment	Santa Clara	SF	BA	2.97E+00	3.68E+00	3.69E+01	2.64E-04	2.79E-03	1.12E-03	3.99E-06	9.49E-05	4.07E-01	0.00E+00	2.38E-05	4.07E-01	128
Surfacing Equipment	Santa Clara	SF	BA	2.06E-01	2.56E-01	4.03E+00	2.92E-05	3.11E-04	1.22E-04	4.47E-07	1.05E-05	4.44E-02	0.00E+00	2.64E-06	4.45E-02	14
Signal Boards	Santa Clara	SF	BA	1.67E+02	3.44E+02	9.67E+01	1.23E-03	7.72E-03	6.47E-03	1.65E-05	3.02E-04	1.06E+00	0.00E+00	1.11E-04	1.06E+00	334
Signal Boards	Santa Clara	SF	BA	8.31E-01	1.22E+00	2.04E+00	6.30E-05	1.99E-04	2.03E-04	2.85E-07	1.64E-05	2.20E-02	0.00E+00	5.68E-06	2.22E-02	7

Construction

Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e
Signal Boards	Santa Clara	SF	BA	1.36E+01	1.99E+01	7.31E+01	1.07E-03	7.29E-03	5.14E-03	9.37E-06	5.81E-04	7.99E-01	0.00E+00	9.62E-05	8.01E-01	252
Signal Boards	Santa Clara	SF	BA	8.43E+00	1.24E+01	8.70E+01	8.73E-04	7.69E-03	5.14E-03	1.07E-05	3.83E-04	9.54E-01	0.00E+00	7.88E-05	9.56E-01	301
Signal Boards	Santa Clara	SF	BA	1.78E+00	2.61E+00	3.02E+01	1.98E-04	2.35E-03	6.80E-04	3.75E-06	6.85E-05	3.33E-01	0.00E+00	1.79E-05	3.33E-01	105
Trenchers	Santa Clara	SF	BA	4.45E+00	7.54E+00	2.91E+00	3.71E-05	2.32E-04	1.95E-04	4.96E-07	9.08E-06	3.19E-02	0.00E+00	3.35E-06	3.20E-02	10
Trenchers	Santa Clara	SF	BA	4.69E+00	7.94E+00	1.19E+01	1.58E-04	9.96E-04	5.38E-04	1.66E-06	3.78E-05	1.31E-01	0.00E+00	1.42E-05	1.31E-01	41
Trenchers	Santa Clara	SF	BA	1.78E+02	3.08E+02	4.74E+02	2.27E-02	5.13E-02	6.15E-02	6.55E-05	5.13E-03	5.07E+00	0.00E+00	2.05E-03	5.11E+00	1,610
Trenchers	Santa Clara	SF	BA	2.42E+02	4.18E+02	1.24E+03	2.53E-02	1.56E-01	9.68E-02	1.59E-04	1.31E-02	1.35E+01	0.00E+00	2.28E-03	1.36E+01	4,279
Trenchers	Santa Clara	SF	BA	2.65E+01	4.57E+01	3.00E+02	4.26E-03	3.37E-02	1.96E-02	3.70E-05	1.82E-03	3.29E+00	0.00E+00	3.84E-04	3.30E+00	1,037
Trenchers	Santa Clara	SF	BA	2.37E+00	4.10E+00	4.15E+01	4.56E-04	4.29E-03	1.39E-03	5.14E-06	1.67E-04	4.57E-01	0.00E+00	4.11E-05	4.58E-01	144
Trenchers	Santa Clara	SF	BA	3.03E+00	5.23E+00	7.40E+01	7.41E-04	6.91E-03	3.17E-03	7.98E-06	2.68E-04	8.13E-01	0.00E+00	6.68E-05	8.15E-01	256
Trenchers	Santa Clara	SF	BA	4.13E-02	7.13E-02	1.90E+00	1.92E-05	1.81E-04	8.15E-05	2.10E-07	6.94E-06	2.09E-02	0.00E+00	1.73E-06	2.10E-02	7
Bore/Drill Rigs	Santa Clara	SF	BA	5.93E-01	1.32E+00	6.23E-01	7.94E-06	4.97E-05	4.16E-05	1.06E-07	1.94E-06	6.82E-03	0.00E+00	7.16E-07	6.84E-03	2
Bore/Drill Rigs	Santa Clara	SF	BA	1.78E+00	3.96E+00	2.88E+00	3.82E-05	2.42E-04	1.30E-04	4.01E-07	9.42E-06	3.16E-02	0.00E+00	3.45E-06	3.17E-02	10
Bore/Drill Rigs	Santa Clara	SF	BA	7.77E+00	1.79E+01	2.54E+01	2.29E-04	2.15E-03	2.02E-03	3.60E-06	8.55E-05	2.78E-01	0.00E+00	2.06E-05	2.79E-01	88
Bore/Drill Rigs	Santa Clara	SF	BA	2.39E+01	5.51E+01	1.93E+02	1.12E-03	1.17E-02	1.29E-02	2.49E-05	5.60E-04	2.12E+00	0.00E+00	1.01E-04	2.12E+00	669
Bore/Drill Rigs	Santa Clara	SF	BA	5.52E+00	1.27E+01	8.17E+01	4.27E-04	4.15E-03	4.80E-03	1.01E-05	1.57E-04	8.98E-01	0.00E+00	3.85E-05	8.99E-01	283
Bore/Drill Rigs	Santa Clara	SF	BA	4.75E+00	1.10E+01	9.32E+01	4.03E-04	3.36E-03	1.88E-03	1.16E-05	9.83E-05	1.03E+00	0.00E+00	3.64E-05	1.03E+00	324
Bore/Drill Rigs	Santa Clara	SF	BA	1.06E+01	2.44E+01	3.43E+02	1.47E-03	1.16E-02	6.72E-03	3.72E-05	3.58E-04	3.79E+00	0.00E+00	1.33E-04	3.80E+00	1,195
Bore/Drill Rigs	Santa Clara	SF	BA	6.40E-01	1.48E+00	4.11E+01	1.76E-04	1.40E-03	8.04E-04	4.57E-06	4.31E-05	4.54E-01	0.00E+00	1.59E-05	4.54E-01	143
Bore/Drill Rigs	Santa Clara	SF	BA	1.07E+00	2.48E+00	1.04E+02	4.82E-04	6.70E-03	2.05E-03	1.15E-05	1.75E-04	1.15E+00	0.00E+00	4.34E-05	1.15E+00	362
Excavators	Santa Clara	SF	BA	2.20E+00	8.40E+00	6.29E+00	8.33E-05	5.26E-04	2.84E-04	8.76E-07	1.96E-05	6.90E-02	0.00E+00	7.51E-06	6.92E-02	22
Excavators	Santa Clara	SF	BA	8.27E+01	3.22E+02	3.73E+02	1.17E-02	3.79E-02	4.44E-02	5.21E-05	3.04E-03	4.03E+00	0.00E+00	1.06E-03	4.05E+00	1,275
Excavators	Santa Clara	SF	BA	2.24E+02	8.75E+02	2.95E+03	4.36E-02	2.77E-01	2.25E-01	3.78E-04	2.26E-02	3.22E+01	0.00E+00	3.93E-03	3.23E+01	10,159
Excavators	Santa Clara	SF	BA	4.33E+02	1.69E+03	8.64E+03	9.56E-02	7.02E-01	5.62E-01	1.07E-03	3.85E-02	9.47E+01	0.00E+00	8.62E-03	9.48E+01	29,853
Excavators	Santa Clara	SF	BA	1.76E+02	6.87E+02	4.93E+03	4.05E-02	3.46E-01	1.19E-01	6.12E-04	1.14E-02	5.44E+01	0.00E+00	3.65E-03	5.45E+01	17,159
Excavators	Santa Clara	SF	BA	1.27E+02	4.95E+02	5.24E+03	4.10E-02	3.25E-01	1.26E-01	5.68E-04	1.15E-02	5.78E+01	0.00E+00	3.70E-03	5.79E+01	18,231
Excavators	Santa Clara	SF	BA	3.23E-01	1.26E+00	2.21E+01	1.74E-04	1.41E-03	5.33E-04	2.45E-06	4.91E-05	2.44E-01	0.00E+00	1.57E-05	2.44E-01	77
Concrete/Industrial Saws	Santa Clara	SF	BA	2.37E-01	3.85E-01	2.89E-01	3.83E-06	2.42E-05	1.31E-05	4.02E-08	9.18E-07	3.17E-03	0.00E+00	3.45E-07	3.18E-03	1
Concrete/Industrial Saws	Santa Clara	SF	BA	2.08E+00	3.30E+00	4.61E+00	1.42E-04	4.54E-04	4.66E-04	6.44E-07	3.72E-05	4.98E-02	0.00E+00	1.29E-05	5.01E-02	16
Concrete/Industrial Saws	Santa Clara	SF	BA	3.62E+00	5.76E+00	1.95E+01	2.81E-04	1.94E-03	1.38E-03	2.50E-06	1.55E-04	2.13E-01	0.00E+00	2.53E-05	2.14E-01	67
Concrete/Industrial Saws	Santa Clara	SF	BA	1.19E-01	1.89E-01	1.38E+00	1.37E-05	1.20E-04	8.19E-05	1.70E-07	6.07E-06	1.51E-02	0.00E+00	1.24E-06	1.51E-02	5
Cement and Mortar Mixers	Santa Clara	SF	BA	3.03E+01	2.49E+01	7.19E+00	9.23E-05	5.81E-04	4.81E-04	1.23E-06	2.45E-05	7.88E-02	0.00E+00	8.33E-06	7.89E-02	25
Cement and Mortar Mixers	Santa Clara	SF	BA	2.73E+00	2.25E+00	1.80E+00	2.90E-05	1.66E-04	8.91E-05	2.50E-07	8.77E-06	1.97E-02	0.00E+00	2.62E-06	1.97E-02	6
Cranes	Santa Clara	SF	BA	2.02E+00	7.08E+00	7.65E+00	3.30E-04	8.19E-04	9.94E-04	1.06E-06	7.81E-05	8.21E-02	0.00E+00	2.97E-05	8.27E-02	26
Cranes	Santa Clara	SF	BA	2.21E+01	7.77E+01	1.79E+02	3.33E-03	2.01E-02	1.39E-02	2.28E-05	1.76E-03	1.95E+00	0.00E+00	3.01E-04	1.95E+00	615
Cranes	Santa Clara	SF	BA	2.21E+01	7.77E+01	2.85E+02	3.79E-03	2.84E-02	1.87E-02	3.51E-05	1.60E-03	3.12E+00	0.00E+00	3.42E-04	3.13E+00	984
Cranes	Santa Clara	SF	BA	4.29E+01	1.51E+02	7.66E+02	7.37E-03	6.84E-02	2.12E-02	9.50E-05	2.38E-03	8.44E+00	0.00E+00	6.65E-04	8.46E+00	2,662
Cranes	Santa Clara	SF	BA	1.57E+01	5.52E+01	4.51E+02	4.05E-03	3.58E-02	1.37E-02	4.88E-05	1.30E-03	4.97E+00	0.00E+00	3.65E-04	4.98E+00	1,566
Cranes	Santa Clara	SF	BA	1.34E+00	4.71E+00	6.47E+01	5.85E-04	5.27E-03	1.96E-03	7.17E-06	1.89E-04	7.13E-01	0.00E+00	5.27E-05	7.15E-01	225
Cranes	Santa Clara	SF	BA	1.69E+00	5.91E+00	2.61E+02	2.70E-03	2.90E-02	9.18E-03	2.88E-05	8.87E-04	2.87E+00	0.00E+00	2.43E-04	2.87E+00	904
Graders	Santa Clara	SF	BA	8.31E-01	2.16E+00	2.77E+00	1.06E-04	2.88E-04	3.43E-04	3.85E-07	2.58E-05	2.98E-02	0.00E+00	9.60E-06	3.00E-02	9
Graders	Santa Clara	SF	BA	5.54E+01	1.44E+02	4.96E+02	8.41E-03	5.24E-02	3.80E-02	6.34E-05	4.42E-03	5.41E+00	0.00E+00	7.58E-04	5.42E+00	1,708
Graders	Santa Clara	SF	BA	1.89E+02	4.93E+02	2.79E+03	3.41E-02	2.59E-01	1.81E-01	3.44E-04	1.42E-02	3.05E+01	0.00E+00	3.08E-03	3.06E+01	9,636
Graders	Santa Clara	SF	BA	1.17E+02	3.06E+02	2.39E+03	2.15E-02	1.96E-01	6.39E-02	2.96E-04	6.80E-03	2.63E+01	0.00E+00	1.94E-03	2.64E+01	8,300
Graders	Santa Clara	SF	BA	3.32E+00	8.66E+00	9.00E+01	7.61E-04	6.59E-03	2.59E-03	9.74E-06	2.38E-04	9.93E-01	0.00E+00	6.86E-05	9.94E-01	313
Graders	Santa Clara	SF	BA	2.06E-02	5.38E-02	1.18E+00	1.01E-05	8.89E-05	3.41E-05	1.31E-07	3.17E-06	1.31E-02	0.00E+00	9.07E-07	1.31E-02	4
Off-Highway Trucks	Santa Clara	SF	BA	3.86E+00	2.10E+01	1.20E+02	1.42E-03	1.01E-02	7.95E-03	1.48E-05	5.65E-04	1.31E+00	0.00E+00	1.28E-04	1.32E+00	415

Construction

Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e
Off-Highway Trucks	Santa Clara	SF	BA	2.85E+01	1.55E+02	1.17E+03	1.03E-02	8.57E-02	2.92E-02	1.45E-04	2.86E-03	1.29E+01	0.00E+00	9.28E-04	1.29E+01	4,073
Off-Highway Trucks	Santa Clara	SF	BA	4.01E+01	2.19E+02	2.70E+03	2.26E-02	1.74E-01	6.70E-02	2.92E-04	6.19E-03	2.98E+01	0.00E+00	2.04E-03	2.98E+01	9,380
Off-Highway Trucks	Santa Clara	SF	BA	4.33E+00	2.36E+01	4.72E+02	3.97E-03	3.14E-02	1.17E-02	5.24E-05	1.10E-03	5.21E+00	0.00E+00	3.58E-04	5.22E+00	1,642
Off-Highway Trucks	Santa Clara	SF	BA	2.03E+00	1.11E+01	3.13E+02	2.87E-03	3.08E-02	8.67E-03	3.47E-05	9.19E-04	3.45E+00	0.00E+00	2.59E-04	3.46E+00	1,088
Crushing/Proc. Equipment	Santa Clara	SF	BA	9.49E+00	2.49E+01	5.08E+01	1.93E-03	5.19E-03	5.97E-03	7.07E-06	4.76E-04	5.47E-01	0.00E+00	1.74E-04	5.50E-01	173
Crushing/Proc. Equipment	Santa Clara	SF	BA	2.68E+01	7.01E+01	2.67E+02	4.49E-03	2.80E-02	2.00E-02	3.41E-05	2.46E-03	2.91E+00	0.00E+00	4.05E-04	2.92E+00	919
Crushing/Proc. Equipment	Santa Clara	SF	BA	1.13E+01	2.97E+01	2.26E+02	2.67E-03	2.10E-02	1.42E-02	2.79E-05	1.16E-03	2.48E+00	0.00E+00	2.41E-04	2.49E+00	782
Crushing/Proc. Equipment	Santa Clara	SF	BA	1.13E+00	2.95E+00	3.27E+01	2.57E-04	2.69E-03	7.80E-04	4.06E-06	8.28E-05	3.61E-01	0.00E+00	2.32E-05	3.61E-01	114
Crushing/Proc. Equipment	Santa Clara	SF	BA	6.35E+00	1.66E+01	2.81E+02	2.06E-03	2.02E-02	6.72E-03	3.05E-05	6.65E-04	3.10E+00	0.00E+00	1.86E-04	3.11E+00	978
Crushing/Proc. Equipment	Santa Clara	SF	BA	3.44E-02	9.01E-02	2.40E+00	1.76E-05	1.79E-04	5.69E-05	2.67E-07	5.76E-06	2.65E-02	0.00E+00	1.59E-06	2.65E-02	8
Crushing/Proc. Equipment	Santa Clara	SF	BA	3.44E-02	9.01E-02	5.34E+00	4.73E-05	5.58E-04	1.51E-04	5.92E-07	1.61E-05	5.89E-02	0.00E+00	4.27E-06	5.90E-02	19
Rough Terrain Forklifts	Santa Clara	SF	BA	6.59E+00	2.05E+01	3.21E+01	1.08E-03	3.25E-03	3.73E-03	4.47E-06	2.77E-04	3.46E-01	0.00E+00	9.71E-05	3.48E-01	110
Rough Terrain Forklifts	Santa Clara	SF	BA	3.15E+02	9.80E+02	2.80E+03	4.29E-02	2.74E-01	2.10E-01	3.58E-04	2.32E-02	3.06E+01	0.00E+00	3.87E-03	3.06E+01	9,645
Rough Terrain Forklifts	Santa Clara	SF	BA	4.04E+01	1.25E+02	7.14E+02	7.92E-03	6.11E-02	4.54E-02	8.81E-05	3.34E-03	7.83E+00	0.00E+00	7.15E-04	7.84E+00	2,469
Rough Terrain Forklifts	Santa Clara	SF	BA	2.25E+00	7.00E+00	5.41E+01	4.30E-04	4.07E-03	1.30E-03	6.72E-06	1.31E-04	5.97E-01	0.00E+00	3.88E-05	5.98E-01	188
Rough Terrain Forklifts	Santa Clara	SF	BA	1.48E+00	4.61E+00	5.35E+01	4.02E-04	3.52E-03	1.27E-03	5.80E-06	1.22E-04	5.90E-01	0.00E+00	3.62E-05	5.91E-01	186
Rubber Tired Loaders	Santa Clara	SF	BA	8.31E-01	2.18E+00	1.68E+00	2.22E-05	1.41E-04	7.59E-05	2.34E-07	5.34E-06	1.84E-02	0.00E+00	2.01E-06	1.85E-02	6
Rubber Tired Loaders	Santa Clara	SF	BA	1.61E+01	4.32E+01	6.24E+01	2.35E-03	6.47E-03	7.62E-03	8.68E-06	5.74E-04	6.72E-01	0.00E+00	2.12E-04	6.76E-01	213
Rubber Tired Loaders	Santa Clara	SF	BA	4.39E+02	1.17E+03	3.16E+03	5.28E-02	3.31E-01	2.41E-01	4.05E-04	2.79E-02	3.45E+01	0.00E+00	4.76E-03	3.46E+01	10,901
Rubber Tired Loaders	Santa Clara	SF	BA	2.47E+02	6.61E+02	3.21E+03	3.86E-02	2.94E-01	2.07E-01	3.95E-04	1.61E-02	3.51E+01	0.00E+00	3.48E-03	3.52E+01	11,079
Rubber Tired Loaders	Santa Clara	SF	BA	2.46E+02	6.58E+02	4.44E+03	3.90E-02	3.60E-01	1.17E-01	5.51E-04	1.23E-02	4.89E+01	0.00E+00	3.51E-03	4.90E+01	15,430
Rubber Tired Loaders	Santa Clara	SF	BA	1.02E+02	2.74E+02	2.94E+03	2.42E-02	2.12E-01	8.32E-02	3.18E-04	7.57E-03	3.24E+01	0.00E+00	2.18E-03	3.24E+01	10,215
Rubber Tired Loaders	Santa Clara	SF	BA	8.33E-01	2.23E+00	4.90E+01	4.05E-04	3.63E-03	1.39E-03	5.43E-06	1.28E-04	5.40E-01	0.00E+00	3.66E-05	5.41E-01	170
Rubber Tired Loaders	Santa Clara	SF	BA	8.95E-02	2.39E-01	6.44E+00	5.88E-05	6.70E-04	2.08E-04	7.13E-07	2.01E-05	7.09E-02	0.00E+00	5.30E-06	7.10E-02	22
Rubber Tired Dozers	Santa Clara	SF	BA	5.93E-01	2.65E+00	1.57E+01	2.69E-04	1.96E-03	1.11E-03	1.93E-06	1.11E-04	1.71E-01	0.00E+00	2.42E-05	1.72E-01	54
Rubber Tired Dozers	Santa Clara	SF	BA	1.45E+01	6.48E+01	5.41E+02	7.52E-03	6.32E-02	2.13E-02	6.69E-05	2.66E-03	5.94E+00	0.00E+00	6.78E-04	5.96E+00	1,875
Rubber Tired Dozers	Santa Clara	SF	BA	2.24E+01	9.97E+01	1.20E+03	1.53E-02	1.28E-01	6.64E-02	1.30E-04	5.27E-03	1.32E+01	0.00E+00	1.38E-03	1.32E+01	4,164
Rubber Tired Dozers	Santa Clara	SF	BA	9.15E-01	4.08E+00	7.41E+01	9.46E-04	7.98E-03	4.09E-03	8.17E-06	3.27E-04	8.13E-01	0.00E+00	8.54E-05	8.15E-01	256
Rubber Tired Dozers	Santa Clara	SF	BA	6.19E-02	2.76E-01	7.45E+00	9.94E-05	9.83E-04	4.45E-04	8.20E-07	3.39E-05	8.16E-02	0.00E+00	8.96E-06	8.18E-02	26
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	1.67E+01	4.32E+01	3.12E+01	4.17E-04	2.65E-03	1.41E-03	4.35E-06	1.13E-04	3.43E-01	0.00E+00	3.76E-05	3.43E-01	108
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	1.00E+02	2.65E+02	3.71E+02	1.05E-02	3.66E-02	4.11E-02	5.19E-05	2.79E-03	4.02E+00	0.00E+00	9.45E-04	4.04E+00	1,270
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	1.34E+03	3.54E+03	8.38E+03	1.12E-01	7.52E-01	6.20E-01	1.07E-03	5.95E-02	9.16E+01	0.00E+00	1.01E-02	9.18E+01	28,890
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	9.98E+01	2.64E+02	1.22E+03	1.22E-02	9.45E-02	7.74E-02	1.51E-04	5.02E-03	1.34E+01	0.00E+00	1.10E-03	1.34E+01	4,223
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	3.23E+01	8.55E+01	6.65E+02	4.88E-03	4.39E-02	1.54E-02	8.26E-05	1.41E-03	7.34E+00	0.00E+00	4.40E-04	7.35E+00	2,313
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	5.21E+01	1.38E+02	2.15E+03	1.51E-02	1.26E-01	5.00E-02	2.68E-04	4.32E-03	2.38E+01	0.00E+00	1.36E-03	2.38E+01	7,495
Tractors/Loaders/Backhoes	Santa Clara	SF	BA	4.16E+00	1.10E+01	2.58E+02	1.82E-03	1.55E-02	5.99E-03	3.21E-05	5.27E-04	2.85E+00	0.00E+00	1.64E-04	2.85E+00	898
Crawler Tractors	Santa Clara	SF	BA	8.31E-01	2.38E+00	2.77E+00	1.30E-04	3.02E-04	3.76E-04	3.82E-07	2.98E-05	2.96E-02	0.00E+00	1.17E-05	2.98E-02	9
Crawler Tractors	Santa Clara	SF	BA	4.71E+02	1.35E+03	4.07E+03	8.20E-02	4.91E-01	3.25E-01	5.21E-04	4.23E-02	4.44E+01	0.00E+00	7.40E-03	4.46E+01	14,026
Crawler Tractors	Santa Clara	SF	BA	1.60E+02	4.57E+02	2.53E+03	3.64E-02	2.71E-01	1.69E-01	3.11E-04	1.51E-02	2.77E+01	0.00E+00	3.28E-03	2.77E+01	8,732
Crawler Tractors	Santa Clara	SF	BA	1.37E+02	3.93E+02	2.96E+03	3.28E-02	2.88E-01	9.42E-02	3.67E-04	1.10E-02	3.26E+01	0.00E+00	2.96E-03	3.27E+01	10,280
Crawler Tractors	Santa Clara	SF	BA	9.39E+01	2.69E+02	3.17E+03	3.25E-02	2.77E-01	1.20E-01	3.42E-04	1.07E-02	3.49E+01	0.00E+00	2.94E-03	3.49E+01	10,991
Crawler Tractors	Santa Clara	SF	BA	5.51E-01	1.58E+00	3.33E+01	3.43E-04	2.97E-03	1.26E-03	3.68E-06	1.14E-04	3.66E-01	0.00E+00	3.10E-05	3.67E-01	115
Crawler Tractors	Santa Clara	SF	BA	5.51E-01	1.58E+00	4.71E+01	5.20E-04	5.51E-03	1.99E-03	5.21E-06	1.75E-04	5.18E-01	0.00E+00	4.69E-05	5.19E-01	163
Skid Steer Loaders	Santa Clara	SF	BA	1.14E+02	2.61E+02	1.64E+02	2.54E-03	1.49E-02	7.94E-03	2.28E-05	7.73E-04	1.80E+00	0.00E+00	2.29E-04	1.80E+00	567
Skid Steer Loaders	Santa Clara	SF	BA	1.03E+03	2.41E+03	2.82E+03	5.33E-02	2.60E-01	2.64E-01	3.96E-04	1.61E-02	3.07E+01	0.00E+00	4.81E-03	3.08E+01	9,687
Skid Steer Loaders	Santa Clara	SF	BA	5.41E+02	1.26E+03	2.46E+03	2.39E-02	1.90E-01	1.72E-01	3.16E-04	1.29E-02	2.69E+01	0.00E+00	2.16E-03	2.70E+01	8,491
Off-Highway Tractors	Santa Clara	SF	BA	5.93E-02	1.81E-01	7.81E-01	1.82E-05	1.07E-04	6.45E-05	9.97E-08	9.19E-06	8.50E-03	0.00E+00	1.64E-06	8.53E-03	3

Construction

Tons/Day																MTons/ Year
Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e
Off-Highway Tractors	Santa Clara	SF	BA	7.26E+01	2.22E+02	1.32E+03	2.17E-02	1.62E-01	9.17E-02	1.63E-04	9.09E-03	1.45E+01	0.00E+00	1.96E-03	1.45E+01	4,564
Off-Highway Tractors	Santa Clara	SF	BA	6.86E+01	2.10E+02	1.24E+03	1.64E-02	1.42E-01	4.72E-02	1.54E-04	5.87E-03	1.37E+01	0.00E+00	1.48E-03	1.37E+01	4,311
Off-Highway Tractors	Santa Clara	SF	BA	3.45E+00	1.06E+01	2.73E+02	3.30E-03	2.87E-02	1.43E-02	3.01E-05	1.16E-03	3.00E+00	0.00E+00	2.98E-04	3.00E+00	946
Off-Highway Tractors	Santa Clara	SF	BA	3.65E-01	1.11E+00	4.13E+01	5.25E-04	5.35E-03	2.35E-03	4.56E-06	1.82E-04	4.53E-01	0.00E+00	4.74E-05	4.54E-01	143
Dumpers/Tenders	Santa Clara	SF	BA	1.42E+00	2.59E+00	8.97E-01	1.22E-05	7.68E-05	4.10E-05	1.25E-07	3.48E-06	9.85E-03	0.00E+00	1.10E-06	9.87E-03	3
Other Construction Equipment	Santa Clara	SF	BA	1.96E+01	3.72E+01	1.71E+01	2.18E-04	1.37E-03	1.15E-03	2.92E-06	5.33E-05	1.88E-01	0.00E+00	1.97E-05	1.88E-01	59
Other Construction Equipment	Santa Clara	SF	BA	3.32E+00	6.29E+00	3.78E+00	5.01E-05	3.17E-04	1.71E-04	5.27E-07	1.24E-05	4.15E-02	0.00E+00	4.52E-06	4.16E-02	13
Other Construction Equipment	Santa Clara	SF	BA	5.10E+00	9.82E+00	1.27E+01	3.28E-04	1.21E-03	1.26E-03	1.78E-06	8.97E-05	1.37E-01	0.00E+00	2.96E-05	1.38E-01	43
Other Construction Equipment	Santa Clara	SF	BA	8.43E+00	1.62E+01	5.99E+01	7.40E-04	5.32E-03	4.24E-03	7.68E-06	4.07E-04	6.55E-01	0.00E+00	6.68E-05	6.56E-01	207
Other Construction Equipment	Santa Clara	SF	BA	1.16E+01	2.24E+01	1.09E+02	9.70E-04	8.35E-03	6.56E-03	1.34E-05	4.18E-04	1.19E+00	0.00E+00	8.75E-05	1.19E+00	376
Other Construction Equipment	Santa Clara	SF	BA	2.70E+01	5.20E+01	5.97E+02	3.58E-03	3.49E-02	1.32E-02	6.48E-05	1.14E-03	6.60E+00	0.00E+00	3.23E-04	6.61E+00	2,080
				13,959	27,106	103,169	1.370	9.040	9.520	0.013	0.556	1,122.454	0.007	0.119	1,127	354,822
				Population	Activity	Consumption	lbs/day					Tons/Day				MTons/Year
				859	1,668	6,348	169	1,112	1,171	2	68	69	0	0	69	21,831
								Percent				6.15%				

As a percent of Total Building Permits issued.

SOURCE: U.S. Census Bureau. <http://censtats.census.gov/cgi-bin/bldgprmt/bldgdisp.pl>

Annual GHG emissions (MTons/Year) multiplied by 347 days/year to account for reduced/limited construction activity on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology for transportation within the Climate Change Scoping Plan Measure Documentation Supplement.

Buildings Estimates with Imputation			
	SC	Palo Alto	
2011	1,029	84	8.2%
2012	1,564	98	6.3%
2013	1,944	111	5.7%
2014	1,968	88	4.5%
avg	1,626	95	6.2%

Lawn & Garden											Tons/Day					MTons/Year				
Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e				
Lawn Mowers	Santa Clara	SF	BA	2.21E+03	1.38E+03	1.56E+02	1.77E-02	4.69E-03	3.17E-01	3.88E-05	2.97E-03	9.42E-01	1.22E-03	1.10E-03	1.34E+00	445				
Lawn Mowers	Santa Clara	SF	BA	1.66E+04	7.03E+02	9.79E+01	2.04E-02	2.56E-03	2.46E-01	1.97E-05	1.62E-03	4.79E-01	6.14E-04	1.27E-03	6.96E-01	231				
Chainsaws	Santa Clara	SF	BA	3.95E+03	3.13E+03	1.87E+02	1.56E-01	2.45E-03	2.82E-01	3.14E-05	4.44E-04	7.63E-01	1.27E-03	9.70E-03	1.36E+00	450				
Chainsaws	Santa Clara	SF	BA	4.44E+04	5.96E+02	3.22E+01	1.59E-02	4.91E-04	6.67E-02	5.99E-06	2.71E-04	1.45E-01	2.46E-04	9.88E-04	2.42E-01	80				
Chainsaws	Santa Clara	SF	BA	2.78E+03	2.21E+03	3.18E+02	2.66E-01	4.17E-03	4.81E-01	5.35E-05	7.57E-04	1.30E+00	1.43E-03	1.65E-02	2.09E+00	692				
Chainsaws	Santa Clara	SF	BA	3.13E+04	4.20E+02	5.28E+01	2.47E-02	8.25E-04	1.07E-01	1.02E-05	5.05E-04	2.48E-01	2.75E-04	1.53E-03	3.65E-01	121				
Chainsaws Preempt	Santa Clara	SF	BA	3.46E+03	2.74E+03	3.96E+02	3.31E-01	5.19E-03	5.98E-01	6.66E-05	9.42E-04	1.62E+00	1.78E-03	2.06E-02	2.60E+00	861				
Chainsaws Preempt	Santa Clara	SF	BA	3.90E+04	5.23E+02	7.37E+01	4.08E-02	8.64E-04	1.58E-01	1.27E-05	3.77E-04	3.08E-01	3.13E-04	2.53E-03	4.58E-01	152				
Trimmers/Edgers/Brush Cutters	Santa Clara	SF	BA	1.29E+04	4.28E+03	1.90E+02	1.03E-01	2.93E-03	3.38E-01	3.76E-05	5.31E-04	9.12E-01	1.61E-03	6.37E-03	1.55E+00	512				
Trimmers/Edgers/Brush Cutters	Santa Clara	SF	BA	1.44E+05	8.46E+03	3.59E+02	1.62E-01	5.87E-03	6.66E-01	7.42E-05	1.05E-03	1.80E+00	3.20E-03	1.01E-02	3.01E+00	995				
Leaf Blowers/Vacuums	Santa Clara	SF	BA	1.92E+04	1.03E+04	5.52E+02	3.81E-01	7.86E-03	9.06E-01	1.01E-04	1.43E-03	2.45E+00	4.12E-03	2.37E-02	4.22E+00	1,398				
Leaf Blowers/Vacuums	Santa Clara	SF	BA	4.96E+04	6.52E+02	3.42E+01	1.68E-02	5.22E-04	7.08E-02	6.36E-06	2.87E-04	1.54E-01	2.65E-04	1.04E-03	2.58E-01	86				
Shredders	Santa Clara	SF	BA	9.72E+01	3.61E+01	1.59E+01	8.91E-04	6.89E-04	4.30E-02	3.38E-06	6.88E-04	8.21E-02	8.01E-05	5.54E-05	1.08E-01	36				
Shredders	Santa Clara	SF	BA	3.46E+03	8.54E+00	4.18E+00	8.55E-04	1.28E-04	1.13E-02	7.99E-07	1.63E-04	1.94E-02	1.63E-05	5.31E-05	2.56E-02	8				
Commercial Turf Equipment	Santa Clara	SF	BA	5.15E+01	1.13E+02	4.63E+01	2.09E-03	1.57E-03	1.26E-01	9.91E-06	1.12E-04	2.41E-01	2.12E-04	1.30E-04	3.09E-01	102				
Commercial Turf Equipment	Santa Clara	SF	BA	2.54E+01	5.57E+01	4.95E+01	2.16E-03	1.65E-03	1.39E-01	1.03E-05	1.17E-04	2.51E-01	1.56E-04	1.34E-04	3.02E-01	100				
Other Lawn & Garden Equipment	Santa Clara	SF	BA	2.18E+01	4.09E+00	2.29E-01	1.12E-04	3.61E-06	4.16E-04	4.63E-08	6.54E-07	1.12E-03	1.76E-06	6.98E-06	1.82E-03	1				
Other Lawn & Garden Equipment	Santa Clara	SF	BA	6.68E+02	7.86E+00	4.76E-01	2.31E-04	7.30E-06	9.91E-04	8.89E-08	4.02E-06	2.16E-03	3.46E-06	1.44E-05	3.53E-03	1				
Other Lawn & Garden Equipment	Santa Clara	SF	BA	9.48E+00	1.78E+00	4.97E-01	2.44E-04	7.85E-06	9.05E-04	1.01E-07	1.42E-06	2.44E-03	1.81E-06	1.52E-05	3.32E-03	1				
Other Lawn & Garden Equipment	Santa Clara	SF	BA	2.91E+02	3.42E+00	9.99E-01	4.58E-04	1.57E-05	2.03E-03	1.94E-07	9.58E-06	4.70E-03	3.51E-06	2.85E-05	6.39E-03	2				
Lawn Mowers	Santa Clara	SF	BA	1.31E+04	8.18E+03	9.82E+02	1.18E-01	2.96E-02	2.20E+00	1.93E-04	1.76E-02	5.57E+00	7.23E-03	6.50E-03	7.95E+00	2,633				
Lawn Mowers	Santa Clara	SF	BA	2.07E+05	8.79E+03	1.22E+03	1.18E-01	3.23E-02	3.39E+00	2.07E-04	1.44E-02	5.99E+00	7.53E-03	6.52E-03	8.47E+00	2,803				
Tillers	Santa Clara	SF	BA	1.36E+03	2.08E+02	2.96E+01	2.67E-03	6.59E-04	7.54E-02	5.43E-06	4.15E-04	1.57E-01	1.70E-04	1.48E-04	2.13E-01	71				
Tillers	Santa Clara	SF	BA	5.27E+03	2.60E+02	3.97E+01	4.15E-03	1.09E-03	1.09E-01	6.79E-06	4.91E-04	1.97E-01	2.40E-04	2.30E-04	2.76E-01	91				
Trimmers/Edgers/Brush Cutters	Santa Clara	SF	BA	2.38E+03	8.86E+02	2.74E+01	3.60E-03	1.60E-03	6.33E-02	5.22E-06	4.92E-05	1.51E-01	5.40E-04	2.00E-04	3.23E-01	107				
Trimmers/Edgers/Brush Cutters	Santa Clara	SF	BA	1.11E+04	6.54E+02	2.29E+01	3.20E-03	1.02E-03	6.21E-02	3.85E-06	1.26E-04	1.11E-01	3.68E-04	1.77E-04	2.29E-01	76				
Leaf Blowers/Vacuums	Santa Clara	SF	BA	6.08E+02	1.03E+02	6.90E+00	5.16E-04	1.26E-04	1.87E-02	1.22E-06	8.27E-05	3.52E-02	5.10E-05	2.86E-05	5.16E-02	17				
Leaf Blowers/Vacuums	Santa Clara	SF	BA	5.22E+02	6.86E+00	5.22E-01	4.76E-05	1.11E-05	1.60E-03	8.08E-08	4.66E-06	2.34E-03	3.83E-06	2.64E-06	3.58E-03	1				
Rear Engine Riding Mowers	Santa Clara	SF	BA	7.15E+03	5.32E+03	1.78E+03	8.34E-02	5.92E-02	5.23E+00	2.45E-04	3.99E-03	8.61E+00	8.57E-03	4.61E-03	1.14E+01	3,762				
Rear Engine Riding Mowers	Santa Clara	SF	BA	6.27E+03	4.84E+02	1.63E+02	7.83E-03	5.27E-03	4.82E-01	2.24E-05	3.13E-04	7.84E-01	7.65E-04	4.33E-04	1.03E+00	341				
Rear Engine Riding Mowers	Santa Clara	SF	BA	3.27E+01	2.43E+01	1.58E+01	7.15E-04	5.17E-04	4.80E-02	1.88E-06	3.45E-05	7.43E-02	5.53E-05	3.96E-05	9.23E-02	31				
Rear Engine Riding Mowers	Santa Clara	SF	BA	2.82E+01	2.18E+00	1.42E+00	6.78E-05	4.22E-05	4.33E-03	1.69E-07	2.66E-06	6.66E-03	4.68E-06	3.75E-06	8.19E-03	3				
Front Mowers	Santa Clara	SF	BA	3.28E+02	2.44E+02	1.30E+02	6.10E-03	4.33E-03	3.83E-01	1.80E-05	2.92E-04	6.30E-01	5.04E-04	3.38E-04	7.93E-01	263				
Front Mowers	Santa Clara	SF	BA	1.06E+04	8.19E+02	4.39E+02	2.11E-02	1.42E-02	1.30E+00	6.03E-05	8.44E-04	2.12E+00	1.66E-03	1.17E-03	2.65E+00	879				
Front Mowers	Santa Clara	SF	BA	2.57E+02	1.91E+02	1.37E+02	6.21E-03	4.48E-03	4.16E-01	1.63E-05	2.99E-04	6.45E-01	4.58E-04	3.44E-04	7.94E-01	263				
Front Mowers	Santa Clara	SF	BA	8.30E+03	6.41E+02	4.63E+02	2.20E-02	1.37E-02	1.41E+00	5.49E-05	8.64E-04	2.17E+00	1.45E-03	1.22E-03	2.64E+00	875				
Shredders	Santa Clara	SF	BA	2.57E+02	9.57E+01	2.63E+01	3.46E-03	1.53E-03	6.08E-02	5.01E-06	4.73E-05	1.45E-01	1.87E-04	1.92E-04	2.07E-01	69				
Shredders	Santa Clara	SF	BA	9.57E+03	2.36E+01	8.14E+00	7.53E-04	2.43E-04	2.54E-02	1.23E-06	6.54E-05	3.57E-02	3.64E-05	4.17E-05	4.79E-02	16				
Lawn & Garden Tractors	Santa Clara	SF	BA	1.31E+03	4.62E+02	2.97E+02	1.17E-02	8.40E-03	8.77E-01	4.11E-05	5.66E-04	1.44E+00	9.67E-04	6.48E-04	1.76E+00	582				
Lawn & Garden Tractors	Santa Clara	SF	BA	8.52E+03	3.41E+02	2.20E+02	9.45E-03	6.57E-03	6.52E-01	3.03E-05	3.87E-04	1.06E+00	7.31E-04	5.23E-04	1.30E+00	431				
Lawn & Garden Tractors	Santa Clara	SF	BA	5.17E+02	1.82E+02	1.86E+02	4.97E-03	4.97E-03	5.67E-01	2.23E-05	3.45E-04	8.79E-01	4.74E-04	4.02E-04	1.03E+00	343				
Lawn & Garden Tractors	Santa Clara	SF	BA	3.36E+03	1.34E+02	1.38E+02	5.95E-03	3.73E-03	4.21E-01	1.64E-05	2.36E-04	6.49E-01	3.50E-04	3.29E-04	7.64E-01	253				
Lawn & Garden Tractors	Santa Clara	SF	BA	7.48E+00	2.13E+00	3.30E+00	5.94E-05	1.15E-04	2.53E-03	3.36E-07	2.11E-06	2.76E-02	7.45E-06	3.29E-06	3.00E-02	10				
Wood Splitters	Santa Clara	SF	BA	4.40E+02	1.55E+02	4.59E+01	4.90E-03	1.22E-03	1.09E-01	8.75E-06	7.44E-04	2.53E-01	2.07E-04	2.71E-04	3.23E-01	107				
Wood Splitters	Santa Clara	SF	BA	1.10E+04	3.32E+01	1.21E+01	9.11E-04	2.37E-04	3.78E-02	1.87E-06	9.67E-05	5.42E-02	4.09E-05	5.05E-05	6.79E-02	22				
Chippers/Stump Grinders	Santa Clara	SF	BA	6.21E+00	2.15E+01	1.84E+01	1.46E-03	1.06E-03	5.39E-02	2.49E-06	7.31E-04	8.72E-02	7.63E-05	7.97E-05	1.12E-01	37				
Chippers/Stump Grinders	Santa Clara	SF	BA	1.11E+01	5.01E-01	4.47E-01	3.31E-05	1.69E-05	1.37E-03	5.80E-08	1.57E-05	2.03E-03	1.46E-06	1.83E-06	2.53E-03	1				
Chippers/Stump Grinders	Santa Clara	SF	BA	3.53E+01	1.22E+02	1.76E+02	1.43E-02	9.10E-03	5.31E-01	2.05E-05	6.79E-03	8.10E-01	5.40E-04	7.82E-04	9.94E-01	329				
Chippers/Stump Grinders	Santa Clara	SF	BA	6.27E+01	2.84E+00	4.21E+00	2.98E-04	1.42E-04	1.31E-02	4.78E-07	1.46E-04	1.88E-02	1.02E-05	1.65E-05	2.23E-02	7				
Commercial Turf Equipment	Santa Clara	SF	BA	4.64E+02	1.02E+03	5.51E+02	3.14E-02	2.20E-02	1.62E+00	7.55E-05	1.48E-03	2.65E+00	2.33E-03	1.73E-03	3.41E+00	1,129				
Commercial Turf Equipment	Santa Clara	SF	BA	2.29E+02	5.01E+02	4.82E+02	2.60E-02	1.96E-02	1.46E+00	5.71E-05	1.26E-03	2.25E+00	1.58E-03	1.43E-03	2.77E+00	918				
Commercial Turf Equipment	Santa Clara	SF	BA	9.22E+01	1.85E+02	3.09E+02	8.17E-03	1.29E-02	4.56E-01	2.72E-05	1.71E-04	2.24E+00	7.63E-04	4.51E-04	2.48E+00	823				
Commercial Turf Equipment	Santa Clara	SF	BA	6.10E-01	1.22E+00	3.00E+00	1.37E-05	8.07E-05	7.48E-04	2.68E-07	2.15E-06	2.77E-02	5.09E-06	7.59E-07	2.93E-02	10				
Other Lawn & Garden Equipment	Santa Clara	SF	BA	4.08E+02	7.66E+01	1.59E+01	1.42E-03	3.51E-04	4.05E-02	2.90E-06	2.21E-04	8.41E-02	7.65E-05	7.87E-05	1.09E-01	36				
Other Lawn & Garden Equipment	Santa Clara	SF	BA	1.25E+04	1.47E+02	3.61E+01	3.21E-03	7.58E-04	1.11E-01	5.58E-06	3.18E-04	1.62E-01	1.52E-04	3.18E-04	2.13E-01	70				
Other Lawn & Garden Equipment	Santa Clara	SF	BA	1.81E+02	3.40E+01	1.54E+01	6.13E-04	4.40E-04	4.54E-02	2.13E-06	2.97E-05	7.47E-02	5.94E-05	3.39E-05	9.38E-02</					

Lawn & Garden												Tons/Day					MTons/Year				
Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e					
Lawn & Garden Tractors	Santa Clara	SF	BA	8.37E+02	1.25E+03	8.12E+02	1.08E-02	6.85E-02	3.67E-02	1.13E-04	2.75E-03	8.91E+00	0.00E+00	9.74E-04	8.93E+00	2,957					
Chippers/Stump Grinders	Santa Clara	SF	BA	4.99E-01	6.35E-01	5.82E-01	7.71E-06	4.87E-05	2.63E-05	8.11E-08	1.85E-06	6.39E-03	0.00E+00	6.96E-07	6.41E-03	2					
Chippers/Stump Grinders	Santa Clara	SF	BA	1.37E+01	1.75E+01	6.08E+01	8.58E-04	6.01E-03	4.22E-03	7.80E-06	4.67E-04	6.65E-01	0.00E+00	7.74E-05	6.66E-01	221					
Chippers/Stump Grinders	Santa Clara	SF	BA	9.42E-01	1.20E+00	7.20E+00	7.00E-05	6.31E-04	4.20E-04	8.89E-07	3.09E-05	7.90E-02	0.00E+00	6.32E-06	7.92E-02	26					
Chippers/Stump Grinders	Santa Clara	SF	BA	2.22E-01	2.82E-01	2.84E+00	1.87E-05	2.21E-04	6.58E-05	3.53E-07	6.66E-06	3.14E-02	0.00E+00	1.69E-06	3.14E-02	10					
Chippers/Stump Grinders	Santa Clara	SF	BA	2.05E+00	2.61E+00	2.92E+01	1.75E-04	2.04E-03	6.89E-04	3.17E-06	6.39E-05	3.23E-01	0.00E+00	1.58E-05	3.23E-01	107					
Chippers/Stump Grinders	Santa Clara	SF	BA	2.33E+00	2.97E+00	7.98E+01	4.90E-04	5.74E-03	1.88E-03	8.86E-06	1.77E-04	8.81E-01	0.00E+00	4.42E-05	8.82E-01	292					
Chippers/Stump Grinders	Santa Clara	SF	BA	4.43E+00	5.64E+00	2.16E+02	1.64E-03	2.18E-02	5.98E-03	2.40E-05	5.97E-04	2.39E+00	0.00E+00	1.48E-04	2.39E+00	791					
Commercial Turf Equipment	Santa Clara	SF	BA	2.69E+01	7.88E+01	3.47E+01	3.94E-04	2.77E-03	2.32E-03	5.91E-06	1.08E-04	3.80E-01	0.00E+00	3.56E-05	3.81E-01	126					
Commercial Turf Equipment	Santa Clara	SF	BA	5.06E+02	1.48E+03	9.76E+02	1.29E-02	8.17E-02	4.41E-02	1.36E-04	3.04E-03	1.07E+01	0.00E+00	1.17E-03	1.07E+01	3,557					
Other Lawn & Garden Equipment	Santa Clara	SF	BA	3.88E-01	4.60E-01	2.57E-01	2.91E-06	2.05E-05	1.72E-05	4.37E-08	8.14E-07	2.81E-03	0.00E+00	2.63E-07	2.82E-03	1					
Other Lawn & Garden Equipment	Santa Clara	SF	BA	5.54E-02	6.57E-02	4.88E-02	6.46E-07	4.08E-06	2.20E-06	6.79E-09	1.55E-07	5.35E-04	0.00E+00	5.83E-08	5.37E-04	0					
				705,041	70,522	13,499	2.108	0.549	27.081	0.002	0.075	83.881	0.055	0.128	103.667	34,326					
				Population	Activity	Consumption	lbs/day					Tons/Day				MTons/Year					
				30,070	3,008	576	180	47	2,310	0	6	4	0	0	4	1,464					
As a percent of 2014 Total Population				SC		1,894,605		Palo Alto		80,805		Percent		4%							
SOURCE: U.S. Census Bureau.																					

Light Commercial						Tons/Day						MTons/Year				
Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e
Generator Sets	Santa Clara	SF	BA	1.30E+02	4.78E+01	2.77E+00	5.84E-04	1.12E-04	5.80E-03	6.34E-07	5.76E-05	1.54E-02	3.41E-05	3.63E-05	2.67E-02	9
Generator Sets	Santa Clara	SF	BA	1.02E+02	2.53E+01	1.58E+00	4.07E-04	5.86E-05	3.55E-03	3.35E-07	3.21E-05	8.14E-03	1.78E-05	2.53E-05	1.42E-02	5
Generator Sets	Santa Clara	SF	BA	1.31E+00	4.82E-01	2.72E-01	1.45E-05	1.02E-05	7.43E-04	5.76E-08	6.38E-07	1.40E-03	1.12E-06	9.02E-07	1.77E-03	1
Generator Sets	Santa Clara	SF	BA	9.99E-01	2.47E-01	1.47E-01	1.76E-05	5.16E-06	4.04E-04	2.95E-08	6.92E-07	7.16E-04	5.68E-07	1.09E-06	9.15E-04	0
Pumps	Santa Clara	SF	BA	5.17E+02	3.65E+02	1.92E+01	2.71E-03	7.96E-04	3.52E-02	4.91E-06	4.19E-04	1.19E-01	2.52E-04	1.68E-04	2.01E-01	67
Pumps	Santa Clara	SF	BA	4.06E+02	1.93E+02	1.09E+01	2.04E-03	4.59E-04	2.18E-02	2.59E-06	2.30E-04	6.30E-02	1.39E-04	1.27E-04	1.09E-01	36
Pumps	Santa Clara	SF	BA	1.39E+02	9.85E+01	4.99E+01	3.22E-03	2.47E-03	1.35E-01	1.06E-05	2.16E-03	2.57E-01	2.53E-04	2.00E-04	3.40E-01	113
Pumps	Santa Clara	SF	BA	1.10E+02	5.20E+01	2.67E+01	1.99E-03	1.27E-03	7.28E-02	5.60E-06	1.14E-03	1.36E-01	1.32E-04	1.24E-04	1.79E-01	59
Pumps	Santa Clara	SF	BA	1.69E+00	1.19E+00	1.32E+00	8.68E-05	5.86E-05	3.67E-03	2.73E-07	5.55E-05	6.62E-03	4.38E-06	5.39E-06	8.09E-03	3
Pumps	Santa Clara	SF	BA	1.31E+00	6.23E-01	6.91E-01	4.57E-05	3.02E-05	1.93E-03	1.43E-07	2.90E-05	3.46E-03	2.27E-06	2.84E-06	4.22E-03	1
Generator Sets	Santa Clara	SF	BA	1.71E+03	6.28E+02	1.51E+02	2.58E-02	6.29E-03	3.49E-01	2.79E-05	2.78E-03	8.08E-01	9.42E-04	1.43E-03	1.13E+00	374
Generator Sets	Santa Clara	SF	BA	1.34E+03	3.32E+02	8.47E+01	1.53E-02	3.31E-03	2.11E-01	1.48E-05	1.44E-03	4.27E-01	4.96E-04	8.49E-04	5.99E-01	198
Generator Sets	Santa Clara	SF	BA	4.69E+03	1.72E+03	1.05E+03	6.87E-02	4.41E-02	3.10E+00	1.42E-04	2.63E-03	5.00E+00	4.30E-03	3.80E-03	6.41E+00	2,122
Generator Sets	Santa Clara	SF	BA	3.68E+03	9.11E+02	5.75E+02	4.75E-02	2.30E-02	1.74E+00	7.53E-05	1.37E-03	2.64E+00	2.25E-03	2.63E-03	3.39E+00	1,124
Generator Sets	Santa Clara	SF	BA	2.52E+03	9.27E+02	1.22E+03	7.71E-02	4.91E-02	3.70E+00	1.44E-04	2.98E-03	5.67E+00	3.41E-03	4.27E-03	6.81E+00	2,256
Generator Sets	Santa Clara	SF	BA	1.98E+03	4.90E+02	6.62E+02	5.11E-02	2.47E-02	2.03E+00	7.59E-05	1.55E-03	2.99E+00	1.75E-03	2.83E-03	3.60E+00	1,191
Generator Sets	Santa Clara	SF	BA	8.39E+02	2.64E+02	5.99E+02	1.31E-02	2.46E-02	4.94E-01	6.03E-05	3.80E-04	4.96E+00	1.23E-03	7.23E-04	5.36E+00	1,773
Generator Sets	Santa Clara	SF	BA	1.62E+02	5.10E+01	2.70E+02	3.90E-03	1.65E-02	8.88E-02	2.37E-05	1.90E-04	2.46E+00	4.56E-04	2.16E-04	2.60E+00	862
Generator Sets	Santa Clara	SF	BA	1.53E+01	4.82E+00	4.34E+01	3.69E-04	2.95E-03	1.30E-02	3.94E-06	3.16E-05	3.97E-01	6.03E-05	2.04E-05	4.16E-01	138
Pumps	Santa Clara	SF	BA	6.06E+02	4.28E+02	7.15E+01	1.18E-02	4.99E-03	1.44E-01	1.45E-05	2.27E-04	4.19E-01	7.07E-04	6.52E-04	6.52E-01	216
Pumps	Santa Clara	SF	BA	4.76E+02	2.26E+02	4.08E+01	7.38E-03	2.52E-03	9.19E-02	7.65E-06	2.55E-04	2.21E-01	3.64E-04	4.09E-04	3.43E-01	114
Pumps	Santa Clara	SF	BA	6.56E+02	4.64E+02	2.54E+02	1.97E-02	1.42E-02	7.38E-01	3.45E-05	1.02E-02	1.21E+00	1.28E-03	1.09E-03	1.63E+00	540
Pumps	Santa Clara	SF	BA	5.16E+02	2.45E+02	1.36E+02	1.11E-02	7.25E-03	4.00E-01	1.82E-05	5.35E-03	6.40E-01	6.64E-04	6.16E-04	8.59E-01	284
Pumps	Santa Clara	SF	BA	1.68E+02	9.11E+01	1.42E+02	1.11E-02	7.09E-03	4.25E-01	1.67E-05	5.53E-03	6.59E-01	4.68E-04	6.14E-04	8.18E-01	271
Pumps	Santa Clara	SF	BA	1.32E+02	6.27E+01	7.52E+01	5.92E-03	3.67E-03	2.26E-01	8.83E-06	2.92E-03	3.48E-01	2.44E-04	3.28E-04	4.31E-01	143
Pumps	Santa Clara	SF	BA	6.70E+01	4.05E+01	9.11E+01	1.96E-03	3.13E-03	7.82E-02	9.10E-06	5.73E-05	7.49E-01	1.68E-04	1.08E-04	8.03E-01	266
Pumps	Santa Clara	SF	BA	8.50E+01	5.14E+01	3.09E+02	4.30E-03	1.40E-02	9.91E-02	2.72E-05	2.18E-04	2.81E+00	3.77E-04	2.38E-04	2.94E+00	972
Pumps	Santa Clara	SF	BA	2.56E+00	1.55E+00	1.40E+01	1.13E-04	7.21E-04	4.32E-03	1.27E-06	1.02E-05	1.28E-01	1.51E-05	6.28E-06	1.33E-01	44
Air Compressors	Santa Clara	SF	BA	2.19E+02	3.39E+02	7.52E+01	1.23E-02	5.43E-03	1.46E-01	1.55E-05	1.46E-04	4.49E-01	6.63E-04	6.78E-04	6.68E-01	221
Air Compressors	Santa Clara	SF	BA	1.72E+02	1.79E+02	3.97E+01	6.48E-03	2.87E-03	7.72E-02	8.19E-06	7.73E-05	2.37E-01	3.50E-04	3.58E-04	3.53E-01	117
Air Compressors	Santa Clara	SF	BA	1.11E+02	1.71E+02	6.66E+01	5.26E-03	3.84E-03	1.94E-01	9.07E-06	2.67E-03	3.18E-01	4.01E-04	2.91E-04	4.48E-01	148
Air Compressors	Santa Clara	SF	BA	8.70E+01	9.05E+01	3.51E+01	2.72E-03	1.98E-03	1.02E-01	4.79E-06	1.41E-03	1.68E-01	2.09E-04	1.50E-04	2.36E-01	78
Air Compressors	Santa Clara	SF	BA	1.49E+01	2.31E+01	2.25E+01	1.82E-03	1.16E-03	6.73E-02	2.64E-06	8.73E-04	1.04E-01	8.32E-05	1.01E-04	1.32E-01	44
Air Compressors	Santa Clara	SF	BA	1.17E+01	1.22E+01	1.19E+01	9.44E-04	6.03E-04	3.56E-02	1.40E-06	4.62E-04	5.51E-02	4.36E-05	5.22E-05	6.97E-02	23
Air Compressors	Santa Clara	SF	BA	2.55E+01	3.38E+01	7.43E+01	2.55E-03	3.33E-03	8.64E-02	6.95E-06	4.38E-05	5.71E-01	1.62E-04	1.41E-04	6.24E-01	207
Air Compressors	Santa Clara	SF	BA	8.26E+01	1.09E+02	4.17E+02	1.04E-02	2.69E-02	2.07E-01	3.54E-05	2.84E-04	3.66E+00	7.93E-04	5.73E-04	3.92E+00	1,298
Air Compressors	Santa Clara	SF	BA	5.56E+00	7.36E+00	5.05E+01	6.36E-04	3.90E-03	1.69E-02	4.56E-06	3.65E-05	4.59E-01	8.00E-05	3.52E-05	4.84E-01	160
Welders	Santa Clara	SF	BA	4.28E+02	2.44E+02	1.38E+02	1.17E-02	7.35E-03	4.08E-01	1.84E-05	5.36E-03	6.47E-01	6.67E-04	6.51E-04	8.67E-01	287
Welders	Santa Clara	SF	BA	1.55E+03	8.80E+02	7.83E+02	6.33E-02	3.82E-02	2.35E+00	9.16E-05	3.03E-02	3.61E+00	2.93E-03	3.50E-03	4.59E+00	1,521
Welders	Santa Clara	SF	BA	1.33E+02	7.58E+01	1.85E+02	5.03E-03	8.05E-03	1.67E-01	1.83E-05	1.15E-04	1.50E+00	3.73E-04	2.78E-04	1.62E+00	538
Welders	Santa Clara	SF	BA	1.36E+02	7.74E+01	2.62E+02	4.95E-03	1.64E-02	9.80E-02	2.28E-05	1.83E-04	2.36E+00	5.08E-04	2.74E-04	2.52E+00	835
Welders	Santa Clara	SF	BA	9.37E+00	5.33E+00	3.22E+01	3.38E-04	2.32E-03	9.93E-03	2.92E-06	2.34E-05	2.94E-01	5.13E-05	1.87E-05	3.10E-01	103
Pressure Washers	Santa Clara	SF	BA	4.59E+02	1.69E+02	5.90E+01	8.73E-03	2.44E-03	1.25E-01	1.17E-05	1.16E-03	3.39E-01	3.08E-04	4.84E-04	4.45E-01	147
Pressure Washers	Santa Clara	SF	BA	3.60E+02	8.91E+01	3.47E+01	6.03E-03	1.38E-03	8.41E-02	6.19E-06	6.05E-04	1.79E-01	1.68E-04	3.34E-04	2.39E-01	79
Pressure Washers	Santa Clara	SF	BA	4.09E+02	1.50E+02	8.90E+01	5.83E-03	3.74E-03	2.63E-01	1.21E-05	2.23E-04	4.24E-01	3.70E-04	3.23E-04	5.45E-01	181
Pressure Washers	Santa Clara	SF	BA	3.21E+02	7.95E+01	4.88E+01	4.03E-03	1.95E-03	1.47E-01	6.39E-06	1.16E-04	2.24E-01	1.94E-04	2.23E-04	2.89E-01	96
Pressure Washers	Santa Clara	SF	BA	7.68E+01	2.83E+01	4.39E+01	2.62E-03	1.75E-03	1.33E-01	5.19E-06	1.07E-04	2.05E-01	1.13E-04	1.45E-04	2.43E-01	80
Pressure Washers	Santa Clara	SF	BA	6.03E+01	1.49E+01	2.37E+01	1.74E-03	8.97E-04	7.26E-02	2.74E-06	5.58E-05	1.08E-01	5.86E-05	9.63E-05	1.28E-01	42
Pressure Washers	Santa Clara	SF	BA	7.50E+00	2.36E+00	5.98E+00	1.16E-04	2.01E-04	4.48E-03	6.10E-07	3.85E-06	5.02E-02	1.02E-05	6.42E-06	5.35E-02	18
Generator Sets	Santa Clara	SF	BA	1.21E+01	3.79E+00	2.38E+01	1.52E-05	1.02E-03	4.99E-03	0.00E+00	1.42E-05	1.59E-01	0.00E+00	1.27E-04	1.62E-01	54
Generator Sets	Santa Clara	SF	BA	9.99E+00	3.15E+00	3.44E+01	1.74E-05	1.46E-03	5.98E-03	0.00E+00	2.07E-05	2.32E-01	0.00E+00	1.46E-04	2.35E-01	78
Gas Compressors	Santa Clara	SF	BA	1.87E+00	4.36E+01	1.49E+02	8.49E-05	3.08E-03	1.50E-02	0.00E+00	7.85E-05	1.02E+00	0.00E+00	7.11E-04	1.04E+00	344
Gas Compressors	Santa Clara	SF	BA	3.87E+00	9.02E+01	8.73E+02	4.63E-04	1.82E-02	2.41E-01	0.00E+00	4.46E-04	5.76E+00	0.00E+00	3.88E-03	5.84E+00	1,934
Gas Compressors	Santa Clara	SF	BA	6.25E-01	1.45E+01	2.24E+02	1.29E-04	4.88E-03	4.89E-02	0.00E+00	1.19E-04	1.50E+00	0.00E+00	1.08E-03	1.52E+00	504
Gas Compressors	Santa Clara	SF	BA	5.00E-01	1.16E+01	2.32E+02	9.93E-05	4.72E-03	5.63E-02	0.00E+00	1.37E-04	1.54E+00	0.00E+00	8.32E-04	1.56E+00	517
Gas Compressors	Santa Clara	SF	BA	4.37E-01	1.02E+01	3.27E+02	1.40E-04	6.65E-03	7.93E-02	0.00E+00	1.93E-04	2.18E+00	0.00E+00	1.17E-03	2.20E+00	728
Generator Sets	Santa Clara	SF	BA	3.15E+02	2.91E+02	1.36E+02	2.02E-03	1.38E-02	9.69E-03	2.31E-05	7.61E-04	1.48E+00	0.00E+00	1.82E-04	1.49E+00	493
Generator Sets	Santa Clara	SF	BA	2.30E+02	2.13E+02	1.71E+02	2.68E-03	1.64E-02	9.08E-03	2.38E-05	8.80E-04	1.88E+00	0.00E+00	2.42E-04	1.88E+00	623
Generator Sets	Santa Clara	SF	BA	2.81E+02	2.60E+02	3.66E+02	9.46E-03	3.49E-02	3.21E-02	5.14E-05	2.61E-03	3.98E+00	0.00E+00	8.53E-04	4.00E+00	1,323
Generator Sets	Santa Clara	SF	BA	4.27E+02	3.95E+02	1.41E+03	1.86E-02	1.36E-01	9.50E-02	1.81E-04	1.00E-02	1.54E+01	0.00E+00	1.68E-03	1.54E+01	5,108
Generator Sets	Santa Clara	SF	BA	2.53E+01	2.34E+01	1.51E+02	1.36E-03	1.29E-02	8.56E-03	1.86E-05	5.94E-04	1.66E+00	0.00E+00	1.22E-04	1.66E+00	549
Generator Sets	Santa Clara	SF	BA	1.41E+01	1.31E+01	1.25E+02										

Light Commercial												Tons/Day					MTons/Year				
Equipment	County	Air Basin	Air Dist.	Population	Activity	Consumption	ROG Exhaust	NOX Exhaust	CO Exhaust	SO2 Exhaust	PM Exhaust	CO2 Exhaust	N2O Exhaust	CH4 Exhaust	CO2e	CO2e					
Pumps	Santa Clara	SF	BA	2.36E+02	2.61E+02	8.85E+01	1.49E-03	9.13E-03	6.31E-03	1.50E-05	5.63E-04	9.67E-01	0.00E+00	1.35E-04	9.70E-01	321					
Pumps	Santa Clara	SF	BA	7.06E+01	7.79E+01	6.93E+01	1.26E-03	6.62E-03	3.67E-03	9.62E-06	3.79E-04	7.58E-01	0.00E+00	1.14E-04	7.61E-01	252					
Pumps	Santa Clara	SF	BA	1.23E+02	1.36E+02	2.15E+02	5.97E-03	2.07E-02	1.97E-02	3.01E-05	1.61E-03	2.33E+00	0.00E+00	5.38E-04	2.34E+00	775					
Pumps	Santa Clara	SF	BA	2.41E+02	2.66E+02	9.48E+02	1.31E-02	9.27E-02	6.50E-02	1.22E-04	7.04E-03	1.04E+01	0.00E+00	1.18E-03	1.04E+01	3,441					
Pumps	Santa Clara	SF	BA	2.61E+01	2.88E+01	1.84E+02	1.73E-03	1.59E-02	1.06E-02	2.27E-05	7.56E-04	2.02E+00	0.00E+00	1.56E-04	2.02E+00	669					
Pumps	Santa Clara	SF	BA	1.88E+01	2.08E+01	1.89E+02	1.15E-03	1.44E-02	4.18E-03	2.35E-05	4.05E-04	2.09E+00	0.00E+00	1.04E-04	2.09E+00	692					
Pumps	Santa Clara	SF	BA	3.71E-01	4.10E-01	6.39E+00	3.53E-05	4.36E-04	1.45E-04	6.93E-07	1.28E-05	7.06E-02	0.00E+00	3.18E-06	7.07E-02	23					
Pumps	Santa Clara	SF	BA	6.19E-02	6.83E-02	1.76E+00	1.00E-05	1.24E-04	4.00E-05	1.96E-07	3.61E-06	1.95E-02	0.00E+00	9.03E-07	1.95E-02	6					
Pumps	Santa Clara	SF	BA	1.36E+00	1.50E+00	9.21E+01	6.90E-04	9.05E-03	2.46E-03	1.02E-05	2.45E-04	1.02E+00	0.00E+00	6.23E-05	1.02E+00	337					
Air Compressors	Santa Clara	SF	BA	3.22E+00	7.18E+00	2.37E+00	4.00E-05	2.45E-04	1.69E-04	4.03E-07	1.51E-05	2.59E-02	0.00E+00	3.61E-06	2.60E-02	9					
Air Compressors	Santa Clara	SF	BA	6.38E+00	1.42E+01	9.37E+00	1.70E-04	8.96E-04	4.97E-04	1.30E-06	5.13E-05	1.03E-01	0.00E+00	1.54E-05	1.03E-01	34					
Air Compressors	Santa Clara	SF	BA	5.79E+01	1.29E+02	1.33E+02	4.97E-03	1.35E-02	1.52E-02	1.86E-05	1.22E-03	1.44E+00	0.00E+00	4.49E-04	1.45E+00	479					
Air Compressors	Santa Clara	SF	BA	3.86E+02	8.61E+02	1.85E+03	3.05E-02	1.93E-01	1.37E-01	2.37E-04	1.68E-02	2.02E+01	0.00E+00	2.76E-03	2.02E+01	6,703					
Air Compressors	Santa Clara	SF	BA	1.46E+01	3.26E+01	1.31E+02	1.51E-03	1.22E-02	8.13E-03	1.62E-05	6.61E-04	1.44E+00	0.00E+00	1.36E-04	1.44E+00	478					
Air Compressors	Santa Clara	SF	BA	2.06E+01	4.58E+01	2.72E+02	2.06E-03	2.23E-02	6.46E-03	3.38E-05	6.78E-04	3.00E+00	0.00E+00	1.86E-04	3.01E+00	996					
Air Compressors	Santa Clara	SF	BA	2.68E+01	5.98E+01	6.27E+02	4.39E-03	4.51E-02	1.50E-02	6.79E-05	1.46E-03	6.92E+00	0.00E+00	3.96E-04	6.93E+00	2,294					
Air Compressors	Santa Clara	SF	BA	1.00E+01	2.24E+01	3.63E+02	2.57E-03	2.70E-02	8.67E-03	4.02E-05	8.60E-04	4.00E+00	0.00E+00	2.32E-04	4.01E+00	1,327					
Air Compressors	Santa Clara	SF	BA	2.48E-01	5.52E-01	1.22E+01	1.01E-04	1.26E-03	3.45E-04	1.35E-06	3.59E-05	1.34E-01	0.00E+00	9.13E-06	1.34E-01	44					
Welders	Santa Clara	SF	BA	1.07E+02	1.88E+02	5.34E+01	9.00E-04	5.51E-03	3.80E-03	9.08E-06	3.40E-04	5.83E-01	0.00E+00	8.12E-05	5.85E-01	194					
Welders	Santa Clara	SF	BA	9.41E+01	1.66E+02	8.53E+01	1.55E-03	8.15E-03	4.52E-03	1.18E-05	4.67E-04	9.33E-01	0.00E+00	1.40E-04	9.36E-01	310					
Welders	Santa Clara	SF	BA	2.90E+02	5.10E+02	6.12E+02	2.09E-02	6.09E-02	6.51E-02	8.54E-05	5.26E-03	6.61E+00	0.00E+00	1.89E-03	6.65E+00	2,201					
Welders	Santa Clara	SF	BA	2.25E+02	3.96E+02	7.15E+02	1.11E-02	7.31E-02	5.14E-02	9.16E-05	6.09E-03	7.81E+00	0.00E+00	1.00E-03	7.83E+00	2,592					
Welders	Santa Clara	SF	BA	1.11E+00	1.96E+00	8.77E+00	9.41E-05	7.97E-04	5.29E-04	1.08E-06	4.14E-05	9.62E-02	0.00E+00	8.49E-06	9.63E-02	32					
Welders	Santa Clara	SF	BA	2.48E-01	4.36E-01	2.35E+00	1.65E-05	1.88E-04	5.44E-05	2.92E-07	5.59E-06	2.59E-02	0.00E+00	1.49E-06	2.59E-02	9					
Welders	Santa Clara	SF	BA	6.19E-01	1.09E+00	8.26E+00	5.32E-05	5.84E-04	1.94E-04	8.95E-07	1.84E-05	9.12E-02	0.00E+00	4.80E-06	9.13E-02	30					
Pressure Washers	Santa Clara	SF	BA	1.46E+01	5.80E+00	1.30E+00	1.92E-05	1.32E-04	9.24E-05	2.20E-07	7.26E-06	1.42E-02	0.00E+00	1.74E-06	1.42E-02	5					
Pressure Washers	Santa Clara	SF	BA	3.40E+00	1.35E+00	4.40E-01	6.90E-06	4.21E-05	2.34E-05	6.12E-08	2.26E-06	4.82E-03	0.00E+00	6.22E-07	4.84E-03	2					
Pressure Washers	Santa Clara	SF	BA	6.75E+00	2.68E+00	1.75E+00	3.49E-05	1.62E-04	1.31E-04	2.47E-07	1.07E-05	1.91E-02	0.00E+00	3.15E-06	1.92E-02	6					
Pressure Washers	Santa Clara	SF	BA	2.79E+00	1.11E+00	1.21E+00	1.41E-05	1.12E-04	7.84E-05	1.56E-07	7.45E-06	1.33E-02	0.00E+00	1.28E-06	1.33E-02	4					
												172.601	0.029	0.052	182.537	60,442					
												Tons/Day					MTons/Year				
				Population	Activity	Consumption	lbs/day	285	4,171	0	31	18	0	0	19	6,278					

As a percent of 2010 Total Employment

SC 970,795 Palo Alto 100,830 Percent 10%

SOURCE: U.S. Census Bureau. Longitudinal Employer-Household Dynamics. <http://lehd.ces.census.gov/> for Santa Clara County. Third Quarter 2012 total employment in Santa Clara County.

A P P E N D I X D

L I S T O F C U L T U R A L R E S O U R C E S

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**CITY OF PALO ALTO
MASTER LIST OF STRUCTURES
ON THE HISTORIC INVENTORY**

<u>Address</u>	<u>Category/District</u>	<u>Address</u>	<u>Category/District</u>
ADDISON AVENUE		BRYANT STREET (Cont)	
271.....	4..... P	440-450	2
281.....	P	529.....	2
301.....	3..... P	533 (formerly 535).....	2
310.....	P	661.....	2
319.....	P	730.....	3
326.....	P	737.....	4
327.....	3..... P	940.....	P
342, 344, 346, 348,		943.....	P
350, 352.....	P	944.....	P
354, 356, 358, 360,		951.....	P
362.....	P	960.....	P
367**, *	1.....	1008.....	P
370.....	P	1005.....	2..... P
376.....	P	1010.....	3..... P
448.....	2	1017-1023	3..... P
449.....	4	1018-1020	3..... P
451.....	2	1027.....	P
933-939	4	1028.....	P
		1033-37	3..... P
ALMA STREET		1036.....	P
141, 143.....	4	1044.....	3..... P
525-529	2	1052.....	4..... P
539.....	2	1061.....	2..... P
799.....	2	1100.....	4..... P
1433.....	4	1106.....	P
		1116.....	P
AMHERST STREET		1121.....	3..... P
2275.....	2	1130.....	3..... P
		1135.....	P
BOYCE AVENUE		1140.....	P
872-874	4	1143.....	P
		1148.....	P
BRYANT STREET		1160.....	4..... P
119.....	2		
215.....	3		

P = Professorville Historic District (listed on the National Register)

R = Ramona Street Architectural District (listed on the National Register)

* = California Registered Historical Landmarks

** = Buildings listed on the National Register of Historic Places

Address Category/District

BRYANT STREET (Cont)

1200.....3..... P
 1201..... P
 1225..... P
 1251.....3..... P
 1301.....4
 1310.....3
 1325.....4
 1445.....4
 1600.....3
 1680 (see 275 Lowell) 2

BYRON STREET

175...(Approved 4/27/09)...2
 228.....2
 1125.....4
 1350.....4
 1504.....4

CALIFORNIA AVENUE

(See also No. California Avenue)

610.....2
 984.....2

CASTILLEJA AVENUE

1621.....4

CHANNING AVENUE

165 (see 865 High).....4
 264.....4
 270.....4
 451-453 4
 459.....4
 627.....4
 633.....3
 764.....3
 825.....4
 951.....2

Address

Category/District

CHAUCER STREET

423.....1

CHURCHILL AVENUE

236.....4
 263.....4
 305.....2
 369.....4
 460.....2

COLERIDGE AVENUE

200.....4
 215.....4
 232.....4
 300.....4
 301.....4
 340.....4
 345.....3
 375.....3
 435.....3
 455.....3
 512.....3
 526.....4
 544.....3
 610.....3

COLLEGE AVENUE

757.....3
 1181.....4
 1487.....3
 1528.....4
 1540.....4

P = Professorville Historic District (listed on the National Register)

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** = Buildings listed on the National Register of Historic Places

Address Category/District

COWPER STREET

209.....3
 215.....4
 223.....4
 321.....4
 327.....4
 360.....4
 705.....3
 706**.....1
 711.....3
 803.....4
 948.....4
 1021.....2
 1055.....2..... P
 1140..... P
 1201..... P
 1211..... P
 1225..... P
 1236..... P
 1238..... P
 1247**.....1..... P
 1300..... P
 1312..... P
 1325..... P
 1330..... P
 1335..... P
 1336**.....1..... P
 1345.....3..... P
 1357.....4..... P
 1390..... P

Address Category/District

COWPER STREET (Cont).

1401.....4..... P
 1415.....4..... P
 1451.....2.....
 1550, 1566, 1570.....2.....
 1855.....4.....
 1928.....1.....
 1950.....1.....
 1990.....1.....
 2240.....3.....

CRESCENT DRIVE

27.....2
 63.....3
 70.....4

DARTMOUTH STREET

2150.....4

EAST CRESCENT DRIVE

525.....4

EDGEWOOD DRIVE

1414.....4
 1450.....4
 1456.....3
 1490.....3

EMBARCADERO ROAD

50.....2.....
 233..... P
 235.....2..... P
 251..... P
 281..... P
 330.....4.....
 359.....4..... P

P = Professorville Historic District (listed on the National Register)

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** = Buildings listed on the National Register of Historic Places

Address Category/District

EMBARCADERO ROAD (Cont)

425-427 2..... P
 467.....vacant parcel P
 473..... P
 475..... P
 505.....4..... P
 2500.....2
 2560.....1

EMERSON STREET

225.....2
 536.....2
 540-542 3
 541-543 3
 544.....4
 611-623 2
 624-640 3
 625-631 2
 635.....4
 800.....4
 1027.....4
 1035.....3
 1101-03 3..... P
 1102..... P
 1111.....4..... P
 1118.....3..... P
 1121..... P
 1128.....4..... P
 1129.....4..... P
 1133..... P
 1134.....4..... P
 1135..... P
 1174..... P
 1176.....3..... P
 1570.....4

Address Category/District

ENCINA AVENUE

51.....2

EVERETT AVENUE

412.....3
 560.....3
 657.....4
 751, 761.....4
 758.....4

FLORENCE STREET

401-403 2
 420.....3

FOREST AVENUE

345.....2
 360.....4
 545.....2
 644.....4
 680.....4
 705.....3
 736.....4
 804.....4
 1001.....4
 1023.....2
 1055.....4
 1145.....2
 1271.....4

FOREST COURT

1009.....1

FULTON STREET

212.....4
 215.....3

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Address Category/District

FULTON STREET (Cont)

216.....4
225.....3
422.....4
640.....4

GREENWOOD AVENUE

1037.....4

HALE STREET

509.....2
567.....2
625.....4

HAMILTON AVENUE

201, 205, 215.....2
235.....3..... R
267.....3..... R
380**.....1
780.....3
964.....4
1220.....2
1266.....4
1300.....4
1424.....4

HANOVER STREET

2050, 2056, 2062
2068, 2074, 2080.....4
2151.....4
2301, 2305, 2311.....4

HARVARD STREET

2051, 2057, 2063.....4
2069, 2075, 2081.....4

Address Category/District

HAWTHORNE AVENUE

381.....3
575.....2

HIGH STREET

212.....3
514/140 University**.....2
617, 621.....3
790.....3
865/165 Channing.....4
900.....2
1141.....4

HOMER AVENUE

200.....2
201.....3
206-210 2
209.....2
212-214 3
230.....4
232.....2
248.....3
300.....2
351.....2
460.....4
475.....2
505.....3
760.....2

ISLAND DRIVE

190.....2

KELLOGG AVENUE

320.....3

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Address Category/District

KINGSLEY AVENUE

200..... P
 221.....2..... P
 222..... P
 252..... P
 257..... P
 262..... P
 303..... P
 319..... P
 325, 327, 333, 335, 343
 345, 353, 355, 363, 365..... P
 334.....2..... P
 356.....1..... P
 358-60 P
 364..... P
 374.....3..... P
 405..... P
 425..... P
 430.....3..... P
 433.....2..... P
 450.....2..... P
 457.....2..... P
 459..... P
 490.....3..... P
 501.....2..... P

KIPLING STREET

249.....3
 321.....4
 405.....4
 411.....4
 421-23 3
 430.....3
 431-433 4
 443.....4

Address Category/District

LELAND AVENUE

390.....4

LINCOLN AVENUE

132.....4
 251.....4..... P
 255..... P
 308.....3..... P
 318.....4..... P
 329..... P
 331..... P
 334.....3..... P
 345.....2..... P
 356.....1..... P
 365.....2..... P
 381.....4..... P
 409..... P
 427..... P
 436..... P
 439..... P
 451..... P
 467.....4..... P
 510.....3..... P
 536.....4
 1250.....4
 1370.....2

LOUISA COURT

1517.....4

LOWELL AVENUE

275/1680 Bryant.....2
 401.....4

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Address Category/District

LOWELL AVENUE (Cont)

535.....4

LYTTON AVENUE

265.....4

555.....3

667.....4

771.....4

851.....3

MAPLE STREET

420** 2

460.....3

MATADERO AVENUE

686.....4

MELVILLE AVENUE

305..... P

315.....4..... P

321..... P

325..... P

330..... P

335..... P

340..... P

353.....3..... P

363..... P

409..... P

433.....2..... P

440..... P

450..... P

Address Category/District

MELVILLE AVENUE (Cont)

465..... P

467, 469..... P

475.....2..... P

480..... P

500.....3..... P

560.....4

567.....2

601-603** 1

MIDDLEFIELD ROAD

101 Middlefield/

710 Palo Alto 4

251.....4

628.....2

1305.....1

MIRAMONTE AVENUE

220.....4

260.....4

MONROE DRIVE

449.....2

NO. CALIFORNIA AVENUE

218, 224, 226, 230.....3

355.....3

450.....2

OBERLIN STREET

2105, 2114, 2115,

2124.....3

2130, 2136.....4

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Address Category/District

OLD ADOBE ROAD

4155* 1

PALO ALTO AVENUE

710 Palo Alto (see

101 Middlefield) 4

1184.....2

PARK BOULEVARD

1795.....3

2110.....2

PARKINSON AVENUE

1230.....3

RAMONA STREET

347.....3

520, 522, 524, 526.....1..... R

528-530 2..... R

533-539 1..... R

532, 534-536 2..... R

538-542 2..... R

541-545 4..... R

628.....2

630.....2

668.....2

734.....4

819.....3

942.....4

948.....4

1000-04-06 P

1001.....3..... P

1013..... P

1020..... P

Address Category/District

RAMONA STREET (Cont)

1021.....4..... P

1024.....4..... P

1029..... P

1030-32 P

1037..... P

1040..... P

1047.....4..... P

1048.....4..... P

1057.....4..... P

1102..... P

1103.....3..... P

1106..... P

1112..... P

1115.....2..... P

1116..... P

1121, 23, 25..... P

1139.....2..... P

1147..... P

1156..... P

RINCONADA AVENUE

272.....4

RUTHVEN AVENUE

466.....4

SCOTT STREET

936.....3

SENECA STREET

449.....2

734.....3

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Address Category/District

STANFORD AVENUE

352.....4
374.....4
591.....4
613.....4
1215.....2
1229.....2

TASSO STREET

181.....3
425.....2
1410.....4
1416.....4

TENNYSON AVENUE

510.....4
595.....2

UNIVERSITY AVENUE

25, 27**, *.....1
95**.....1
121, 125.....2
140 (see 514 High)**.....2
180/504, 508 Emerson.....3
223.....3
251-255.....3
271.....3
323.....2
384-396/502 Waverley.....3
415, 417, 419.....3
423.....3
436, 444, 448, 452.....2
456.....1
460, 464, 468, 470.....
472, 476.....2
480, 486, 488, 490.....
494, 498.....2
564.....2

Address Category/District

UNIVERSITY AVENUE (Cont)

755.....2
851.....4
860**.....1
900**, *.....1
939.....2
950.....4
970.....2
1057.....4
1130.....4
1505.....4
1800.....3
1870.....2

WAVERLEY STREET

121.....4
502 (see 384-396 University)3
510.....2
526.....3
650.....2
736.....4
745...(Approved 06/22/09)...2
751.....2
1010..... P
1020..... P
1022..... P
1050..... P
1101..... P
1110..... P
1130..... P
1135.....4..... P
1136.....3..... P
1146.....4..... P
1155.....4..... P
1177..... P
1207..... P
1220.....4..... P
1221..... P

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Address Category/District

WAVERLEY STREET (Cont)

1240..... P
 1245..... P
 1248..... P
 1303.....4..... P
 1321..... P
 1327..... P
 1329..... P
 1331..... P
 1431.....2
 1800-08 4
 2051.....4
 2101.....1
 2261.....4
 2510.....2

WAVERLEY OAKS

100/110** 1

WEBSTER STREET

1022.....4
 1026.....4
 1128.....4
 1151.....4
 1400.....4
 1432.....3
 1525.....4
 1651.....4
 1849.....4

WELLESLEY STREET

2300.....2
 College Terrace Library
 [Council approved re-designation from
 Category 4 to 2 on 4/7/08]

Address Category/District

WHITMAN COURT

334..... P
 373-75 4..... P

WILSON STREET

1295.....3.....

YALE AVENUE

2130.....3.....
 2310** 3.....

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City of Palo Alto Historic Resources Listed on Federal or State Registry

Resource Name	National Register Reference No.	National Register Listed Date	State Designation	State Plaque No.	State Listed Date	Address/ Location
ALLEN, THEOPHILUS, HOUSE	99000580	05/20/99	California Register	N2056	05/20/99	601 Melville Ave.
ASHBY HOUSE	not federally listed	not federally listed	California Point of Interest	P465	12/22/75	1145 Forest Avenue
BRIONES DE MIRANDA, JUANA, HOME ON RANCHO	not federally listed	not federally listed	California Historic Landmark	524	11/01/54	4157 Old Adobe Rd.
BUELNA, ANTONIO, ADOBE	not federally listed	not federally listed	California Point of Interest	P152	11/03/69	
CLARKE'S/ WILSON'S LANDING	not federally listed	not federally listed	California Point of Interest	P156	11/03/69	
DE LEMOS, PEDRO, HOUSE	80000863	01/10/80	California Register	N854	01/10/80	100-110 Waverley Oaks
DOWNING, T. B., HOUSE	73000452	10/30/73	California Register	N265	10/30/73	706 Cowper St.
DUNKER HOUSE	82002264	02/19/82	California Register	N1041	02/19/82	420 Maple St.
EL PALO ALTO	not federally listed	not federally listed	California Point of Interest	P327	03/15/74	El Palo Alto Park_ Alma _Palo Alto Ave
FIRST COMMUNITY CENTER AND PALO ALTO CITY	not federally listed	not federally listed	California Point of Interest	P161	11/03/69	
FIRST ELEMENTARY SCHOOL	not federally listed	not federally listed	California Point of Interest	P157	11/03/69	
FIRST HOSPITAL	not federally listed	not federally listed	California Point of Interest	P158	11/03/69	
FIRST MAYFIELD SCHOOL	not federally listed	not federally listed	California Point of Interest	P151	11/03/69	
FRATERNAL HALL BUILDING	90000119	02/15/90	California Register	N1625	02/15/90	140 University Ave. and 514 High St.
GAMBLE HOUSE	not federally listed	not federally listed	California Point of Interest	P675	09/02/86	1431 Waverley Street
GREEN GABLES	04000863	07/28/05	California Register	N2291	07/28/05	Channing Ave., Ivy Ln., Greer Rd., Wildwood Ln.
GREENMEADOW	04000862	07/28/05	California Register	N2292	07/28/05	Nelson Dr., El Capitan Pl., Adobe Pl., Creekside Dr.
HARBOR MASTER'S ADOBE	not federally listed	not federally listed	California Point of Interest	P490	10/29/76	2500 Embarcadero Road
HEWLETT-PACKARD HOUSE AND GARAGE/	07000307	04/20/07	California Historic Landmark	976; N2361	08/13/87	367 Addison Ave.
HOSTESS HOUSE	76000528	07/30/76	California Historic Landmark	895	04/02/76	W of University Ave. underpass of El Camino Real (NR); 27 Mitchell Ln, near NE corner of
INDIAN MOUNDS	not federally listed	not federally listed	California Point of Interest	P154	11/03/69	
INVENTION OF THE FIRST COMMERCIALY	not federally listed	not federally listed	California Historic Landmark	1000	05/08/91	844 E Charleston Rd.
KEE HOUSE	85000715	04/11/85	California Register	N1355	04/11/85	2310 Yale St.
MIDDLEFIELD CROSSING	not federally listed	not federally listed	California Point of Interest	P153	11/03/69	
MUYBRIDGE, EADWEARD, AND THE DEVELOPMENT OF MOTION PICTURES	not federally listed	not federally listed	California Historic Landmark	834	11/03/69	Palo Alto Stock Farm - Stanford University, Campus Dr W across from Stanford Driving Range (NOT WITHIN CITY OF PALO ALTO JURISDICTION)
NORRIS HOUSE	80000859	07/24/80	California Register	N891	07/24/80	1247 Cowper St.
OLD PALO ALTO FIRE DEPARTMENT	not federally listed	not federally listed	California Point of Interest	P508	07/28/77	450 Bryant St.
PALO ALTO MEDICAL CLINIC	10000357	06/21/10	California Register		06/21/10	300 Homer Ave.
PALO ALTO SOUTHERN PACIFIC RAILROAD DEPOT	96000425	04/18/96	California Register	N1948	04/18/96	95 University Ave.
PETTIGREW HOUSE	80000860	11/25/80	California Register	N932	11/25/80	Address Restricted (1336 Cowper St.)
PIONEER ELECTRONICS RESEARCH LABORATORY	not federally listed	not federally listed	California Historic Landmark	836	11/03/69	In sidewalk, SE corner of Channing Ave and Emerson St.
PROFESSORVILLE HISTORIC DISTRICT	80000861	10/03/80	California Point of Interest	P143; N906	08/29/69	Roughly bounded by Embarcadero Rd., Addison Ave., Emerson and Cowper Sts.
RAMONA STREET ARCHITECTURAL DISTRICT	86000592	03/27/86	California Register	N1434	03/27/86	518-581 Ramona St. and 255-267 Hamilton Ave.
ROBLES, SECUNDINO, ADOBE SITE	not federally listed	not federally listed	California Point of Interest	P159	11/03/69	
SOTO, RAFAEL, HOME SITE	not federally listed	not federally listed	California Point of Interest	P160	11/03/69	
SQUIRE, JOHN ADAMS, HOUSE	72000255	03/06/72	California Historic Landmark	857; N160	10/31/72	900 University Ave.
ST. THOMAS AQUINAS CHURCH	not federally listed	not federally listed	California Point of Interest	P466	12/22/75	751 Waverley Street
U. S. POST OFFICE	81000175	04/05/81	California Point of Interest	P491; N953	10/29/76	380 Hamilton Ave.
UNCLE JIM'S CABIN	not federally listed	not federally listed	California Point of Interest	P155	11/03/69	
WALLIS, SARAH, HOME SITE	not federally listed	not federally listed	California Historic Landmark	969	09/02/86	S side of La Selva Dr between Military Way and Magnolia Dr.
WILSON HOUSE	80000862	01/02/80	California Register	N850	01/02/80	860 University St.
WOMEN'S CLUB OF PALO ALTO	14001114	01/17/15	California Register		01/17/15	475 Homer Ave.

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

APN	ADDRESS	Comment
137-17-025	925 Roble Ridge Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-07-064		Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
167-04-001	No Address	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-055	471 Addison Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-30-044	1101 Alma Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-25-060	201 Alma Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-30-044	1107 Alma Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-07-062	2230 Amherst Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-07-004	2264 Bowdoin Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-091	541 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-091	543 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-091	545 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-091	547 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-091	549 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-19-076	2160 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-035	635 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-28-106	918 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 806 Bryant St)
120-24-038	162 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-28-105	904 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 802_804 Bryant St)
120-28-057	932 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 846 Bryant St)
120-15-091	543 Bryant Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-055	518 Byron Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-085	336 Byron Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-05-024	2277 Byron Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-33-020	421 California Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP; (Initially deemed NOT eligible (Priority 1 List); Re-evaluated and found to be eligible for the NRHP
124-33-001	321 California Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-05-066	1590 California Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-10-016	555 Center Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

APN	ADDRESS	Comment
120-05-014	669 Channing Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-32-060	751 Channing Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-090	471 Channing Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-05-014	667 Channing Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-05-014	671 Channing Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-07-046	545 Chaucer Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-05-016	560 Chaucer Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-01-006	538 Churchill Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-02-010	660 Coleridge Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-08-021	380 Coleridge Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-01-019	509 Coleridge Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-01-018	537 Coleridge Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-08-068	418 Coleridge Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-02-004	570 Coleridge Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-01-102	643 College Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-03-036	1082 College Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-03-036	1080 College Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-03-031	1032 College Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-01-102	645 College Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-02-041	2127 Cornell Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-02-042	2115 Cornell Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-02-041	2133 Cornell Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-02-042	2121 Cornell Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	820 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-08-085	1630 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
120-14-024	252 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-04-019	2175 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

APN	ADDRESS	Comment
120-14-024	250 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-049	904 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-011	818 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-10-005	2150 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-01-020	1535 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-08-085	1620 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
124-06-010	1965 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-06-008	2005 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-059	330 Cowper Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-09-006	75 Crescent Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-09-028	50 Crescent Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-20-022	1275 Dana Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
008-04-001	2601 East Bayshore Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
008-04-001	2800 East Bayshore Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-10-025	541 East Crescent Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-11-041	1474 Edgewood Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-11-027	1451 Edgewood Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
003-11-022	1485 Edgewood Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-11-027	1449 Edgewood Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
003-11-066	1401 Edgewood Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-31-081	2171 El Camino Real	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
132-19-056	315 El Carmelo Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
132-19-056	311 El Carmelo Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-16-033	1464 Emerson Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-16-033	1436 Emerson Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-27-071	731 Emerson Street	SOFA II Determined Historic Resource; Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

[illegible]

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

APN	ADDRESS	Comment
120-04-031	555 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-04-031	555 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-04-031	555 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-043	446 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-043	446 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-043	446 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-043	446 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-043	446 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-038	332 Forest Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-58-033	1726 Fulton Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-33-036	1011 Fulton Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-33-037	1001 Fulton Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-03-053	365 Guinda Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-03-007	381 Guinda Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP; (Initially deemed NOT eligible (Priority 1 List); Re-evaluated and found to be eligible for the NRHP
003-05-021	551 Hale Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-02-033	755 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-27-003	132 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
003-03-033	855 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

APN	ADDRESS	Comment
003-04-022	925 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-04-021	951 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-27-003	136 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
003-11-012	1407 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-23-014	1452 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-04-073	972 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-04-019	975 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-11-009	1423 Hamilton Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-03-066	2131 Harvard Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-002	544 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-002	554 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-12-061	365 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-12-016	375 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-002	546 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-002	548 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-002	550 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-002	552 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-12-062	363 Hawthorne Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-25-103	323 High Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-25-104	317 High Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-25-107	334 High Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-27-003	610 High Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
120-25-108	342 High Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-25-108	344 High Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-05-010	680 Homer Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-16-051	469 Homer Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-11-005	175 Island Drive	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-16-012	230 Kellogg Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-16-017	270 Kellogg Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-07-043	360 Kellogg Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-06-071	559 Kingsley Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

APN	ADDRESS	Comment
120-17-021	823 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-022	817 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-022	819 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-021	825 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-025	832 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-020	437 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-023	815 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
120-15-020	437 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-020	437 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-020	437 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-025	832 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-025	832 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-15-020	437 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-025	832 Kipling Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-06-033	630 Lincoln Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
127-40-024	2931 Louis Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
127-40-024	2933 Louis Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
127-40-024	2933 Louis Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
127-40-024	2933 Louis Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
127-40-024	2933 Louis Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
127-40-024	2933 Louis Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
127-40-024	2933 Louis Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-24-005	1511 Madrono Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-24-005	311 Manzanita Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-06-038	419 Maple Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-012	218 Middlefield Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-017	258 Middlefield Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-01-035	211 Middlefield Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-47-020	1313 Newell Road	Deemed eligible for the NRHP in 2002; Eligible for the CRHR due to eligibility for the NRHP (
003-47-020	1213 Newell Road	Deemed eligible for the NRHP in 2002; Eligible for the CRHR due to eligibility for the NRHP (
003-57-060	1990 Newell Road	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-09-059	426 Palo Alto Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

[illegible]

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

[illegible]

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

[illegible]

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

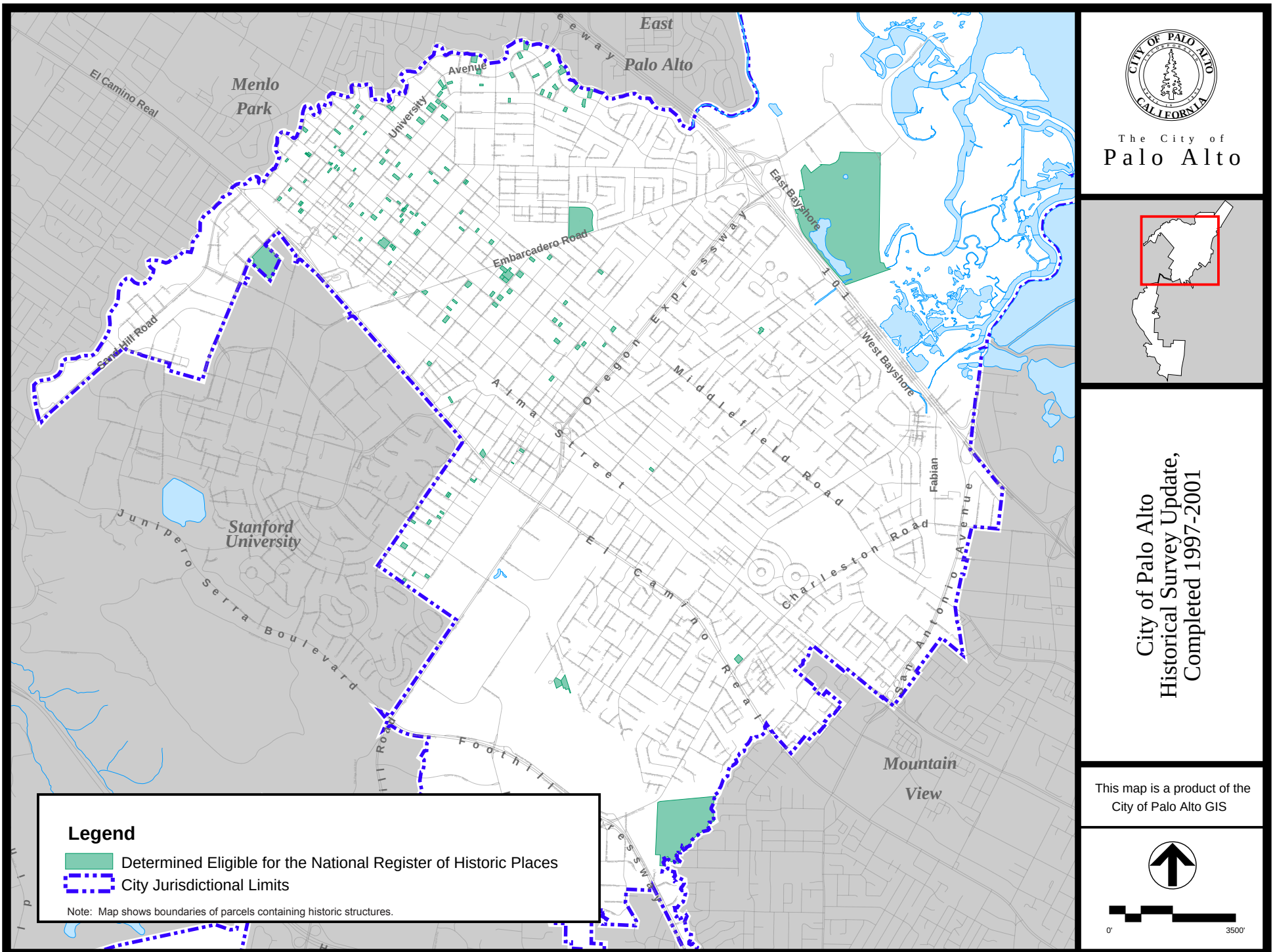
APN	ADDRESS	Comment
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
120-28-109	845 Ramona Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Moved from 840 Bryant St)
137-17-006	955 Roble Ridge	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-09-013	435 Santa Rita Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-06-009	1247 Stanford Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-06-020	1341 University Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-05-026	1056 University Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
003-08-006	1570 University Avenue	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-050	311 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-050	311 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-086	324 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-086	326 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-030	845 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

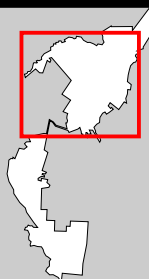
APN	ADDRESS	Comment
120-16-061	720 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-083	313 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-078	385 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-07-026	1545 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-059	959 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-17-060	947 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-14-080	333 Waverley Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-02-032	251 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-04-025	619 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-04-067	723 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
124-05-053	2280 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-03-061	1935 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-04-025	621 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-07-037	1235 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-04-067	719 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP (Designation may not apply to accessory buildings)
120-04-025	623 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP

City of Palo Alto Historic Resources Deemed Eligible for the National or California Historic Registries

APN	ADDRESS	Comment
120-07-076	1345 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
120-03-059	530 Webster Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
124-25-039	1757 Park Boulevard	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP
137-06-040	2025 Columbia Street	Deemed eligible for the NRHP in 1998; Eligible for the CRHR due to eligibility for the NRHP



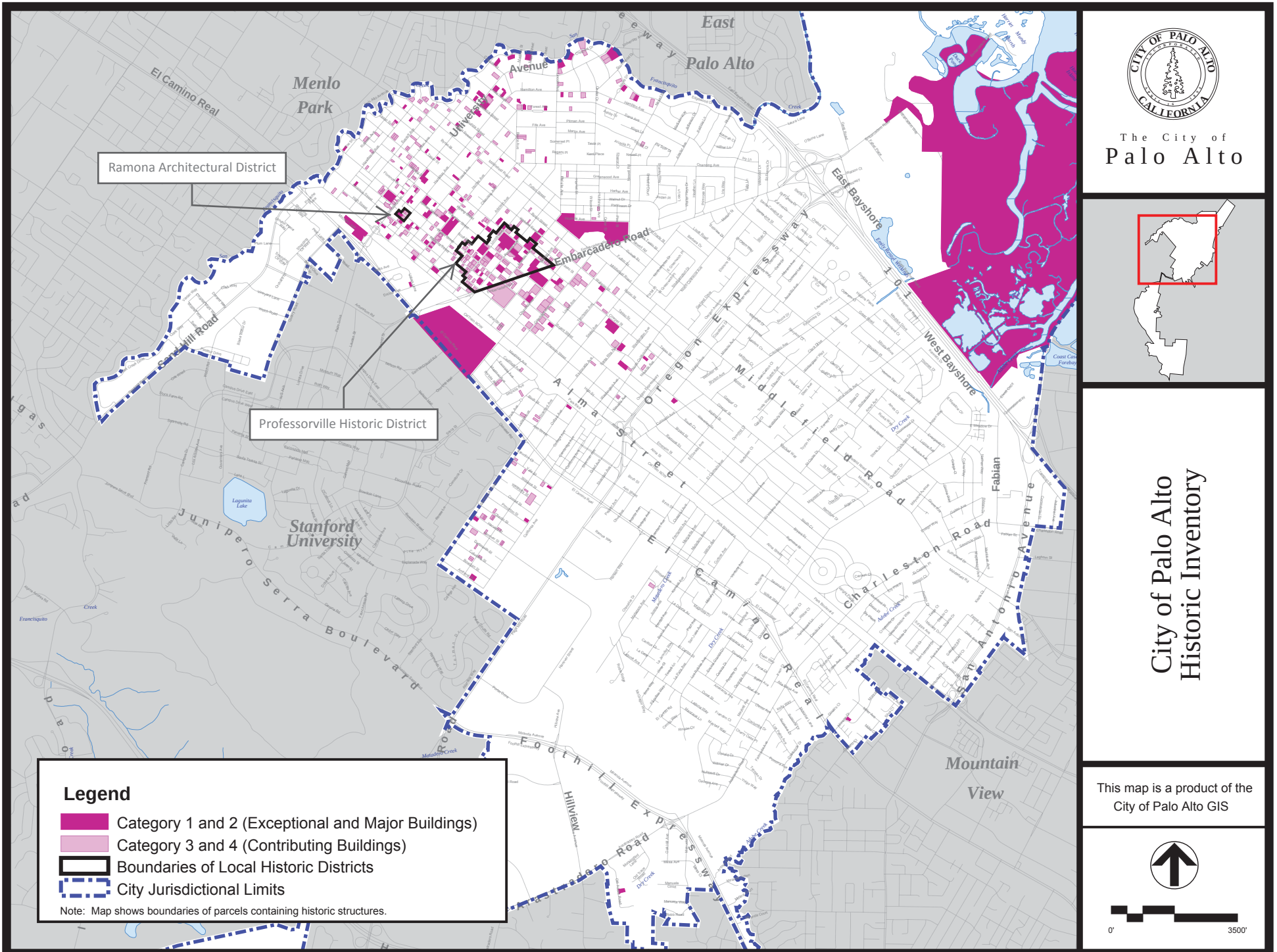
The City of
Palo Alto



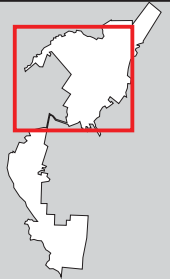
City of Palo Alto
Historical Survey Update,
Completed 1997-2001

This map is a product of the
City of Palo Alto GIS





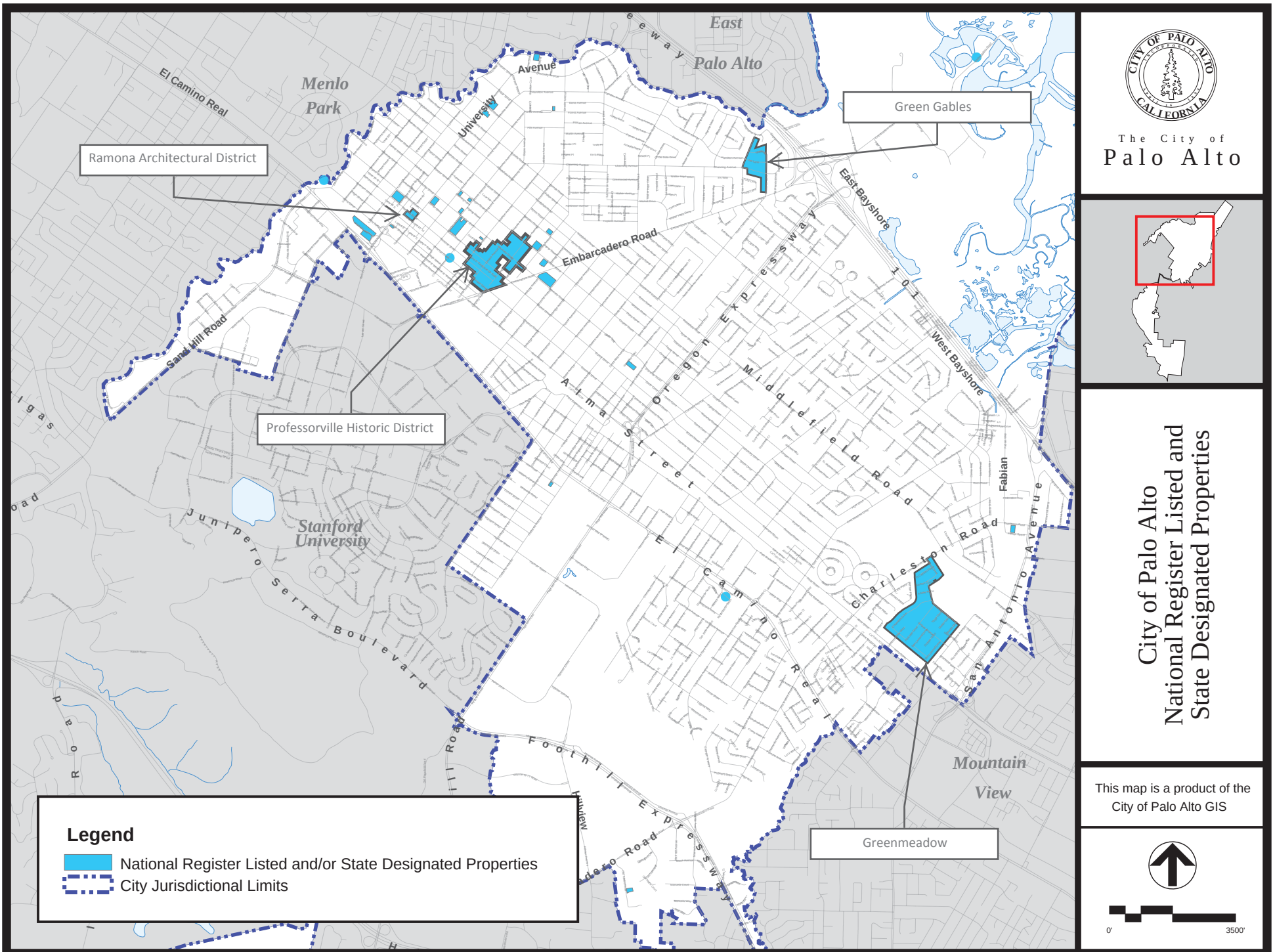
The City of
Palo Alto



City of Palo Alto Historic Inventory

This map is a product of the
City of Palo Alto GIS





A P P E N D I X E

HAZARDOUS MATERIALS

APPENDIX E**TABLE E-1 ENVIROSTOR CLEANUP PROGRAM SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Palo Alto Town & Country Village	Voluntary Cleanup	Active	855 El Camino Real, Palo Alto, Ca 94301
Advalloy Corporation	Historical	Refer: RWQCB	844 East Charleston Road, Palo Alto, CA 94303
Coherent, Inc., Laser Group Division	Tiered Permit	Refer: Other Agency	3210 Porter Drive, Palo Alto, CA 94303
Ford Aerospace	Historical	Refer: RWQCB	3825 Fabian Way, Palo Alto, CA 94303
Ford Aerospace	Historical	Refer: RWQCB	1036 East Meadow Circle, Palo Alto, CA 94303
Ford Aerospace & Communications	Historical	Refer: RWQCB	3939 Fabian Way, Palo Alto, CA 94303
Gemfire Corporation	Tiered Permit	Inactive – Needs Evaluation	2440 Embarcadero Way, Palo Alto, CA 94303
Hammon Plating Corporation	Tiered Permit	Active	890 Commercial Street, Palo Alto, CA 94303
Hewlett-Packard Company	Haz Waste	Closed	3500 Deer Creek Road, Palo Alto, CA 94303
Hewlett-Packard Company	Haz Waste – RCRA	Closed	395 Page Mill Road, Palo Alto, CA 94303
Hewlett-Packard Labs	Tiered Permit	Refer: Other Agency	3500 Deer Creek Road, Palo Alto, CA 94303
Intevac	Corrective Action	Refer: RWQCB	601 California Avenue, Palo Alto, CA 94303
Intevac	Haz Waste – RCRA	Closed	601 California Avenue, Palo Alto, CA 94303
Palo Alto Municipal Sanitary Landfill	Historical	Refer: RWQCB	2380 Embarcadero Road, Palo Alto, CA 94303
Space Systems/Loral	Corrective Action	Refer: RWQCB	3825 Fabian Way, Palo Alto, CA 94303
Space Systems/Loral LLC Building 4	Haz Waste – RCRA	Closed	3825 Fabian Way, Palo Alto, CA 94303
Specific Plating Co., Inc.	Tiered Permit	Inactive – Needs Evaluation	936 Industrial Avenue, Palo Alto, CA 94303

APPENDIX E

TABLE E-1 ENVIROSTOR CLEANUP PROGRAM SITES IN THE EIR STUDY AREA

Site/Facility Name	Program Type	Status	Address
1601 S California Avenue	Voluntary Cleanup	Active	1601 California Avenue, Palo Alto, CA 94304
Affymax Inc	Haz Waste	Protective Filer	4001 Miranda Avenue, Palo Alto, CA 94308
Alza Pharmaceuticals	Historical	Refer: RWQCB	1454 Page Mill Road, Palo Alto, CA 94304
Aydin Energy	State Response	Certified / Operation & Maintenance – Land Use Restrictions	3180 Hanover Street, Palo Alto, CA 94304
California Avenue Housing Phase II Site	Voluntary Cleanup	No Further Action	1501 California Avenue , Palo Alto, CA 94304
California Avenue Housing Site	Voluntary Cleanup	No Further Action	1451-1481 California Avenue , Palo Alto, CA 94304
Coherent, Inc.	State Response	Certified / Operation & Maintenance	3210 Porter Drive, Palo Alto, CA 94304
Communications & Power Industries, Inc.	Tiered Permit	No Further Action	607 Hansen Way (Contiguous Pr) , Palo Alto, CA 94304
Communications & Power Industries, Inc.	Corrective Action	No Further Action	607 Hansen Way (Contiguous Pr) , Palo Alto, CA 94304
Communications & Power Industries, Inc.	Haz Waste – RCRA	Closed	607 Hansen Way, Palo Alto, CA 94308
Dow Jones & Company, Wall Street Journal	Tiered Permit	Inactive – Needs Evaluation	1701 Page Mill Road, Palo Alto, CA 94304
Dpix, LLC	Tiered Permit	Inactive – Needs Evaluation	3406 Hillview Avenue, Palo Alto, CA 94304
General Instrument Corporation	Corrective Action	Refer: Smbpr	3400 Hillview Avenue, Palo Alto, CA 94308
General Instrument Corporation	Haz Waste – RCRA	Closed	3400 Hillview Avenue, Palo Alto, CA 94308
Hewlett Packard	State Response	Refer: RWQCB	1501 Page Mill Road, Palo Alto, CA 94304
Hewlett Packard Building 15	State Response	Certified / Operation & Maintenance	3215 Porter Drive, Palo Alto, CA 94304
Hewlett Packard Buildings 28a, B, and C	State Response	Certified / Operation & Maintenance	Corner Of Page Mill Rd and Porter Drive, Palo Alto, CA 94304

APPENDIX E**TABLE E-1 ENVIROSTOR CLEANUP PROGRAM SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Hewlett-Packard	Corrective Action	Inactive – Needs Evaluation	3500 Deer Creek Road, Palo Alto, CA 94308
Hewlett-Packard (620-640 Page Mill Road)	Federal Superfund – Listed	Refer: RWQCB	620-640 Page Mill Road, Palo Alto, CA 94304
Hewlett-Packard Company	Haz Waste – RCRA	Closed	1501 Page Mill Road, Palo Alto, CA 94308
Hewlett-Packard Company	Historical	Refer: RWQCB	3500 Deer Creek Road, Palo Alto, CA 94304
Hewlett-Packard Company	Corrective Action	Refer: RWQCB	1501 Page Mill Road, Palo Alto, CA 94308
Hewlett-Packard Labs – Page Mill, Palo Alto	Tiered Permit	Refer: Other Agency	1501 Page Mill Road, Palo Alto, CA 94304
Hillview Porter Plume	State Response	Certified / Operation & Maintenance	Hillview Avenue and Porter Drive, Palo Alto, CA 94304
Intevac/Eo Sensors, Inc.	Tiered Permit	Inactive – Needs Evaluation	601 California Avenue, Palo Alto, CA 94304
Lockheed Martin Space Systems Co	Haz Waste	Closed	3251 Hanover Street, Palo Alto, CA 94308
Lockheed Missiles and Space Co Bldg. 255	State Response	Certified / Operation & Maintenance	3170 Porter Drive, Palo Alto, CA 94304
Oregon Expressway Underpass	Historical	Refer: RWQCB	Xing Of Oregon Expressway & Alma Street, Palo Alto, CA 94304
Phototime, Inc.	Tiered Permit	Inactive – Needs Evaluation	138 Stanford Shopping Center, Palo Alto, CA 94304
Roche Bioscience	Tiered Permit	Inactive – Needs Evaluation	3401 Hillview Avenue, Palo Alto, CA 94308
Schlumberger	Historical	Refer: RWQCB	3340 Hillview Avenue, Palo Alto, CA 94308
Smithkline and French Laboratories	State Response	Certified / Operation & Maintenance	3400 Hillview Avenue, Palo Alto, CA 94308
Syntex	State Response	Certified / Operation & Maintenance	3300 Hillview Avenue, Palo Alto, CA 94308
Teledyne Mec	State Response	Certified / Operation & Maintenance	3165 Porter Drive, Palo Alto, CA 94308

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TABLE E-1 ENVIROSTOR CLEANUP PROGRAM SITES IN THE EIR STUDY AREA

Site/Facility Name	Program Type	Status	Address
Teledyne Singer	State Response	Certified / Operation & Maintenance	3176 Porter Drive, Palo Alto, CA 94304
Varian	State Response	Certified / Operation & Maintenance	611 Hansen Way, Palo Alto, CA 94304
Varian Medical Systems	Tiered Permit	Inactive – Needs Evaluation	911, 913, 3075, 3030, & 3140 Hansen Way, Palo Alto, CA 94304
Varian Medical Systems Palo Alto	Inspection	No Action	611 Hansen Way, Palo Alto, CA 94304
Varian Medical Systems Palo Alto	Haz Waste	Closed	3120 Hansen Way, Palo Alto, CA 94308
Varian Nmr Systems	Corrective Action	Refer: Smbpr	3120 Hansen Way, Palo Alto, CA 94308
Veterans Affairs Palo Alto	Voluntary Cleanup	No Further Action	3801 Miranda Avenue , Palo Alto, CA 94304
Watkin's-Johnson Co. – Palo Alto	Tiered Permit	Inactive – Needs Evaluation	3333 Hillview Avenue, Palo Alto, CA 94304
Watkins Johnson Company (Srp)	State Response	Certified / Operation & Maintenance	3333 Hillview Avenue, Palo Alto, CA 94304
Xerox Corporation, Palo Alto Research Center	Tiered Permit	Inactive – Needs Evaluation	3333 Coyote Hill Road, Palo Alto, CA 94304
Stanford University	Haz Waste	Closed	Oak Road & Stockform Roads, Stanford, CA 94308
Stanford University	Corrective Action	Inactive – Needs Evaluation	Oak Road & Stockform Roads, Stanford, CA 94308
Stanford University ESF	Haz Waste – Standardized	Closed	640 Oak Road, Stanford, CA 94308
Stanford University ESF	Corrective Action	No Further Action	640 Oak Road, Stanford, CA 94308
Stanford University, Env. Health & Safety	Tiered Permit	Refer: Other Agency	Est/Oak Road, Stanford, CA 94308
Dura-Bond Bearing	Historical	Refer: RWQCB	395 Portage Avenue, Palo Alto, CA 94306
Hewlett-Packard Co. – Palo Alto Fabrica Ctr.	Tiered Permit	Inactive - Needs Evaluation	395 Page Mill Road, Palo Alto, CA 94306

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TABLE E-1 ENVIROSTOR CLEANUP PROGRAM SITES IN THE EIR STUDY AREA

Site/Facility Name	Program Type	Status	Address
Hewlett-Packard Company	Corrective Action	Refer: RWQCB	395 Page Mill Road, Palo Alto, CA 94306
Xerox Palo Alto Research Center	Historical	Refer: RWQCB	3406 Hillview Avenue, Palo Alto, CA 94306

Source: Department of Toxic Substances Control, EnviroStor, October 2015.

APPENDIX E

TABLE E-2 **GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
901 Alma Street	Cleanup Program Site	Completed – Case Closed	901 Alma Street, Palo Alto, CA 94301
At&T/SBC (P1-007)	Permitted Underground Storage Tank (UST)		345 Hamilton Avenue, Palo Alto, CA 94301
Bill Young's Automotive	LUST Cleanup Site	Completed – Case Closed	849 High Street, Palo Alto, CA 94301
Bill's Auto Glass	LUST Cleanup Site	Completed – Case Closed	744 High Street, Palo Alto, CA 94301
Calif Dept of Forestry	Cleanup Program Site	Completed – Case Closed	2249 Jamacha Road, Palo Alto, CA 92308
Cardinal Cleaners	Cleanup Program Site	Open – Site Assessment	203 Forest Avenue, Palo Alto, CA 94301
Chevron #9-0136	LUST Cleanup Site	Completed – Case Closed	745 El Camino Real, Palo Alto, CA 94301
City of Palo Alto (Sidewalk)	LUST Cleanup Site	Completed – Case Closed	291 Alma Street, Palo Alto, CA 94301
City of Palo Alto Civic Center	Permitted Underground Storage Tank (UST)		250 Hamilton Avenue, Palo Alto, CA 94301
City of Palo Alto Fire Station #1	Permitted Underground Storage Tank (UST)		301 Alma Street, Palo Alto, CA 94301
City of Palo Alto Parking Lot	LUST Cleanup Site	Completed – Case Closed	528 High Street, Palo Alto, CA 94301
City of Paris Cleaners	LUST Cleanup Site	Completed – Case Closed	248 Homer Avenue, Palo Alto, CA 94301
Cloudburst Car Wash	LUST Cleanup Site	Completed – Case Closed	841 El Camino Real, Palo Alto, CA 94301
Coldwell Banker	LUST Cleanup Site	Completed – Case Closed	291 Alma Street, Palo Alto, CA 94301
Commuter Shell	Permitted Underground Storage Tank (UST)		355 Alma Street, Palo Alto, CA 94301
D & M Auto Repair	LUST Cleanup Site	Completed – Case Closed	190 Channing Ave nue, Palo Alto, CA 94301
D&B Automotive	LUST Cleanup Site	Completed – Case Closed	841 Alma Street, Palo Alto, CA 94301
Ellenberger Property	LUST Cleanup Site	Completed – Case Closed	1240 Dana Street, Palo Alto, CA 94301

APPENDIX E**TABLE E-2 GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Fletcher Property	LUST Cleanup Site	Completed – Case Closed	2020 Waverly Street, Palo Alto, CA 94301
Gunn Residence	Permitted Underground Storage Tank (UST)		455 Lowell Avenue, Palo Alto, CA 94301
Hansen Plumbing	LUST Cleanup Site	Completed – Case Closed	50 Homer Avenue, Palo Alto, CA 94301
Hewlett-Packard Company	Cleanup Program Site	Completed – Case Closed	130 Lytton Avenue, Palo Alto, CA 94301
Hyatt, Classic Residence	LUST Cleanup Site	Completed – Case Closed	620 Sand Hill Road, Palo Alto, CA 94301
Independent Bmw	LUST Cleanup Site	Completed – Case Closed	400 Emerson Street, Palo Alto, CA 94301
Keenan Land Co	LUST Cleanup Site	Completed – Case Closed	753 Alma Street, Palo Alto, CA 94301
Keenan Land Company	LUST Cleanup Site	Completed – Case Closed	975 High Street, Palo Alto, CA 94301
Kurt's Auto Care	LUST Cleanup Site	Completed – Case Closed	780 High Street, Palo Alto, CA 94301
Lawson Brothers Cleaners	LUST Cleanup Site	Completed – Case Closed	853 Alma Street, Palo Alto, CA 94301
Leonard Ely Property	LUST Cleanup Site	Completed – Case Closed	390 Lytton Avenue, Palo Alto, CA 94301
Minkoff Group (former Premier Properties)	Cleanup Program Site	Open – Assessment & Interim Remedial Action	385-399 Sherman Avenue, Palo Alto, CA 94301
Monte Vista Ranger Station	LUST Cleanup Site	Open – Site Assessment	2249 Jamacha Road, Palo Alto, CA 92308
Morris Auto Parts	LUST Cleanup Site	Completed – Case Closed	999 Alma Street, Palo Alto, CA 94301
Office Building	LUST Cleanup Site	Completed – Case Closed	529 Bryant Street, Palo Alto, CA 94301
Oregon Expressway Underpass	Cleanup Program Site	Open – Remediation	Alma Street, Palo Alto, CA 94301
Pacific Bell	LUST Cleanup Site	Completed – Case Closed	345 Hamilton Avenue, Palo Alto, CA 94301
Palo Alto Civic Center	LUST Cleanup Site	Completed – Case Closed	250 Hamilton Avenue, Palo Alto, CA 94301

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TABLE E-2 **GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Palo Alto Fire Station #2	LUST Cleanup Site	Completed – Case Closed	2675 Hanover Street, Palo Alto, CA 94301
Palo Alto Golf Course	LUST Cleanup Site	Completed – Case Closed	1875 Embarcadero Road, Palo Alto, CA 94301
Palo Alto Medical Foundation	LUST Cleanup Site	Completed – Case Closed	795 El Camino Real, Palo Alto, CA 94301
Palo Alto Transmission Service	LUST Cleanup Site	Completed – Case Closed	701 Emerson Street, Palo Alto, CA 94301
Pasco	Cleanup Program Site	Completed – Case Closed	2000 Geng Road, Palo Alto, CA 94301
Peninsula Creamery	LUST Cleanup Site	Completed – Case Closed	900 High Street, Palo Alto, CA 94301
Peninsula Creamery	LUST Cleanup Site	Completed – Case Closed	800 High Street, Palo Alto, CA 94301
Premier Properties	LUST Cleanup Site	Completed – Case Closed	250 University Avenue, Palo Alto, CA 94301
Presidents Hotel	LUST Cleanup Site	Completed – Case Closed	498 University Avenue, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301

APPENDIX E**TABLE E-2 GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Open – Site Assessment	Private Residence, Palo Alto, CA 94301
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Palo Alto, CA 94301
Shearer Family Trust	LUST Cleanup Site	Completed – Case Closed	530 Webster Street, Palo Alto, CA 94301
Shell – 2200 El Camino	LUST Cleanup Site	Completed – Case Closed	2200 El Camino Real, Palo Alto, CA 94301
Shell – 299 S California	LUST Cleanup Site	Open – Site Assessment	299 S. California Avenue, Palo Alto, CA 94301
Shell – 355 Alma	LUST Cleanup Site	Completed – Case Closed	355 Alma Street, Palo Alto, CA 94301
Sherman's Auto	LUST Cleanup Site	Completed – Case Closed	710 San Antonio Road, Palo Alto, CA 94301
Soltau Property	LUST Cleanup Site	Completed – Case Closed	1111 Hamilton Avenue, Palo Alto, CA 94301
Stanford B.M.W.	LUST Cleanup Site	Completed – Case Closed	275 Alma Street, Palo Alto, CA 94301
Steve's Foreign Auto Service	LUST Cleanup Site	Completed – Case Closed	809 Alma Street, Palo Alto, CA 94301
Tidy Town Cleaners	LUST Cleanup Site	Completed – Case Closed	163 Everett Street, Palo Alto, CA 94301

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TABLE E-2 **GEOTracker SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
United States Postal Service (USPS)	LUST Cleanup Site	Completed – Case Closed	2085 East Bayshore Road, Palo Alto, CA 94301
Vance Brown & Sons	LUST Cleanup Site	Completed – Case Closed	3101 Park Boulevard, Palo Alto, CA 94301
Varsity Theatre	LUST Cleanup Site	Completed – Case Closed	456 University Avenue, Palo Alto, CA 94301
Vickers Concrete	LUST Cleanup Site	Completed – Case Closed	4083 Transport Street, Palo Alto, CA 94301
Wilbur Property	LUST Cleanup Site	Completed – Case Closed	490 Kingsley Avenue, Palo Alto, CA 94301
Winston Tire Company	LUST Cleanup Site	Completed – Case Closed	955 Alma Street, Palo Alto, CA 94301
940 Commercial Street	Cleanup Program Site	Completed – Case Closed	940 Commercial Street, Palo Alto, CA 94303
Advalloy – East Charleston, Inc.	Cleanup Program Site	Open – Remediation	844 East Charleston Road, Palo Alto, CA 94303
Advalloy – East Charleston, Inc.	LUST Cleanup Site	Completed – Case Closed	844 East Charleston Road, Palo Alto, CA 94303
anderson Honda	Cleanup Program Site	Open – Site Assessment	1766 Embarcadero Road, Palo Alto, CA 94303
Arco Facility # 1326	Permitted Underground Storage Tank (UST)		840 San Antonio Road, Palo Alto, CA 94303
Bay Centerless Grinding	Cleanup Program Site	Completed – Case Closed	939 Industrial Avenue, Palo Alto, CA 94303
Beacon (#590)	LUST Cleanup Site	Completed – Case Closed	780 San Antonio Avenue, Palo Alto, CA 94303
Building F- Waste Oil UST TKCJL	Cleanup Program Site	Open – Eligible for Closure	851-901 San Antonio Road, Palo Alto, CA 94303
Carlsen Motors	LUST Cleanup Site	Completed – Case Closed	1730 Embarcadero Road, Palo Alto, CA 94303
Chabad of the Greater S Bay	LUST Cleanup Site	Completed – Case Closed	3070 Louis Road, Palo Alto, CA 94303
City of Palo Alto Fire Station #4	Permitted Underground Storage Tank (UST)		3600 Middlefield Road, Palo Alto, CA 94303
City of Palo Alto Matadero Creek Pump Station	Permitted Underground Storage Tank (UST)		1080 Colorado Avenue, Palo Alto, CA 94303

APPENDIX E**TABLE E-2 GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
City of Palo Alto Municipal Service Center	Permitted Underground Storage Tank (UST)		3201 E Bayshore Road, Palo Alto, CA 94303
City of Palo Alto Utility Control	Permitted Underground Storage Tank (UST)		3241 E. Bayshore Road, Palo Alto, CA 94303
City of Palo Alto, Matedero	LUST Cleanup Site	Completed – Case Closed	1080 Colorado Avenue, Palo Alto, CA 94303
Collagen Inc	LUST Cleanup Site	Completed – Case Closed	2500 Faber Place, Palo Alto, CA 94303
Comstock Property	LUST Cleanup Site	Completed – Case Closed	595 Tennyson Avenue, Palo Alto, CA 94303
Continental Water Systems	LUST Cleanup Site	Completed – Case Closed	930 Commercial Street, Palo Alto, CA 94303
Dyna Bell	LUST Cleanup Site	Completed – Case Closed	151 Laura Lane, Palo Alto, CA 94303
El Camino Manufacturing	LUST Cleanup Site	Completed – Case Closed	989 Commercial Street, Palo Alto, CA 94303
Embarcadero Shell	Permitted Underground Storage Tank (UST)		1161 Embarcadero Road, Palo Alto, CA 94303
Facciola Meat	LUST Cleanup Site	Completed – Case Closed	961 E Charleston Road, Palo Alto, CA 94303
Facciola Meat Company	LUST Cleanup Site	Completed – Case Closed	961 E Charleston Road, Palo Alto, CA 94303
Ford Aerospace	LUST Cleanup Site	Completed – Case Closed	3939 Fabian Way, Palo Alto, CA 94303
Former Ford Aerospace	Cleanup Program Site	Open – Remediation	3825 Fabian Way, Palo Alto, CA 94303
Former Symtron Facility	Cleanup Program Site	Completed – Case Closed	4019 Transport Street, Palo Alto, CA 94303
Gopower	LUST Cleanup Site	Completed – Case Closed	1890 Embarcadero Road, Palo Alto, CA 94303
Green Hills Country Club	Permitted Underground Storage Tank (UST)		End of Ludeman Lane, Palo Alto, CA 94303
Hengehold Motor Co. Inc.	Permitted Underground Storage Tank (UST)		762 San Antonio Road, Palo Alto, CA 94303

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TABLE E-2 **GEOTracker SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Hengehold Motor Company	LUST Cleanup Site	Completed – Case Closed	762 San Antonio Road, Palo Alto, CA 94303
Hewlett Packard	LUST Cleanup Site	Completed – Case Closed	3500 Deer Creek Road, Palo Alto, CA 94303
Hewlett Packard	LUST Cleanup Site	Completed – Case Closed	3500 Deer Creek Road, Palo Alto, CA 94303
Mobil	LUST Cleanup Site	Completed – Case Closed	4201 Middlefield Road, Palo Alto, CA 94303
Moon Dry Cleaners	Cleanup Program Site	Completed – Case Closed	2125 Saint Francis Drive, Palo Alto, CA 94303
Mozart Property	LUST Cleanup Site	Completed – Case Closed	1068 Meadow Cir E, Palo Alto, CA 94303
Old Piers Dairy	LUST Cleanup Site	Completed – Case Closed	3065 Louis Road, Palo Alto, CA 94303
Old Piers Dairy	LUST Cleanup Site	Completed – Case Closed	3065 Louis Road, Palo Alto, CA 94303
Old Post Office Palo Alto	LUST Cleanup Site	Completed – Case Closed	2197 E Bayshore Road, Palo Alto, CA 94303
Palo Alto 76	Cleanup Program Site	Open – Eligible for Closure	835 San Antonio Road, Palo Alto, CA 94303
Palo Alto 76	Permitted Underground Storage Tank (UST)		835 San Antonio Road, Palo Alto, CA 94303
Paramount Roofing	LUST Cleanup Site	Completed – Case Closed	4030 Transport Street, Palo Alto, CA 94303
Park Plaza	Cleanup Program Site	Open – Site Assessment	195 Page Mill Road, Palo Alto, CA 94303
Pinn Brothers Construction Co.	LUST Cleanup Site	Completed – Case Closed	759 Loma Verde Avenue, Palo Alto, CA 94303
Portage Llc	Cleanup Program Site	Open – Remediation	3159 El Camino Real
Prb Pollock Llc	Cleanup Program Site	Open – Remediation	2755 El Camino Real, Palo Alto, CA 94303
Riley Vacuum Service	LUST Cleanup Site	Completed – Case Closed	950 Commercial Street, Palo Alto, CA 94303
Shell	LUST Cleanup Site	Completed – Case Closed	811 E Charleston Road, Palo Alto, CA 94303

APPENDIX E**TABLE E-2 GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Shell	LUST Cleanup Site	Completed – Case Closed	1161 Embarcadero Road, Palo Alto, CA 94303
Stanford Auto Plaza	LUST Cleanup Site	Completed – Case Closed	1766 Embarcadero Road, Palo Alto, CA 94303
Stanford Honda	LUST Cleanup Site	Completed – Case Closed	1766 Embarcadero Road, Palo Alto, CA 94303
Taube Koret Campus – Altaire – Bridge Parcels I & II	Cleanup Program Site	Open – Verification Monitoring	901 San Antonio Road, Palo Alto, CA 94303
Toyota of Palo Alto	LUST Cleanup Site	Completed – Case Closed	690 San Antonio Road, Palo Alto, CA 94303
Unocal #4297	LUST Cleanup Site	Completed – Case Closed	835 San Antonio Road, Palo Alto, CA 94303
Us Post Office	LUST Cleanup Site	Completed – Case Closed	2085 E Bayshore Road, Palo Alto, CA 94303
Valero #3804	Permitted Underground Storage Tank (UST)		705 San Antonio Road, Palo Alto, CA 94303
Werner Texaco	LUST Cleanup Site	Completed – Case Closed	830 E Charleston Road, Palo Alto, CA 94303
West Marine	Cleanup Program Site	Completed – Case Closed	850 San Antonio Road, Palo Alto, CA 94303
3400 Hillview Avenue Site [NPDES]	Cleanup Program Site	Open – Remediation	3400 Hillview Avenue, Palo Alto, CA 94304
Alza Building D	Cleanup Program Site	Completed – Case Closed	2575 Hanover Street, Palo Alto, CA 94304
Arastra Hostel	LUST Cleanup Site	Completed – Case Closed	1529 Arastradero Road, Palo Alto, CA 94304
Beckman Coulter	Cleanup Program Site	Open – Remediation	1050 Page Mill Road, Palo Alto, CA 94304
Beckman Instruments	Cleanup Program Site	Completed – Case Closed	1050 Page Mill Road, Palo Alto, CA 94304
Birch Plaza	Cleanup Program Site	Completed – Case Closed	2640 & 2650 Birch Street, Palo Alto, CA 94304
Chevron	LUST Cleanup Site	Completed – Case Closed	775 Page Mill Road, Palo Alto, CA 94304
Chevron #9-9000	LUST Cleanup Site	Completed – Case Closed	480 Quarry Road, Palo Alto, CA 94304

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TABLE E-2 **GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
City of Palo Alto Fire Street #2	Permitted Underground Storage Tank (UST)		2675 Hanover Street, Palo Alto, CA 94304
Classic Residence by Hyatt	Permitted Underground Storage Tank (UST)		620 Sand Hill Road, Palo Alto, CA 94304
Consolidated Freightways	LUST Cleanup Site	Completed – Case Closed	3240 Hillview Avenue, Palo Alto, CA 94304
Dow Jones	LUST Cleanup Site	Completed – Case Closed	1701 Page Mill Road, Palo Alto, CA 94304
Dow Jones	LUST Cleanup Site	Completed – Case Closed	1701 Page Mill Road, Palo Alto, CA 94304
Dow Jones & Company Inc. – Wall Street Journal	Permitted Underground Storage Tank (UST)		1701 Page Mill Road, Palo Alto, CA 94304
Dpix LLC	Cleanup Program Site	Completed – Case Closed	3406 Hillview Avenue, Palo Alto, CA 94304
Eastman Kodak Company	Cleanup Program Site	Open – Inactive	925 Page Mill Road, Palo Alto, CA 94304
Emporium Capwell	LUST Cleanup Site	Completed – Case Closed	180 El Camino Real, Palo Alto, CA 94304
Fairchild Semiconductor Site	Cleanup Program Site	Open – Remediation	4001 Miranda Avenue, Palo Alto, CA 94304
Foothill Park	LUST Cleanup Site	Completed – Case Closed	3300 Page Mill Road, Palo Alto, CA 94304
Hewlett Packard – Building 20	Permitted Underground Storage Tank (UST)		3000 Hanover Street, Palo Alto, CA 94304
Hewlett- Packard Company	Cleanup Program Site	Open – Remediation	3500 Deer Creek Road, Palo Alto, CA 94304
Hewlett-Packard	LUST Cleanup Site	Completed – Case Closed	395 Page Mill Road, Palo Alto, CA 94304
Hewlett-Packard Company	Cleanup Program Site	Open – Remediation	640 Page Mill Road, Palo Alto, CA 94304
Hewlett-Packard Company	Cleanup Program Site	Open – Remediation	1501 Page Mill Road, Palo Alto, CA 94304
Hewlett-Packard Company Building 15 Site [NPDES]	Cleanup Program Site	Open – Remediation	3215 Porter Drive, Palo Alto, CA 94304

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TABLE E-2 GEOTRACKER SITES IN THE EIR STUDY AREA

Site/Facility Name	Program Type	Status	Address
Hillview Porter Regional Program [NPDES]	Cleanup Program Site	Open – Remediation	3215 Porter Drive, Palo Alto, CA 94304
Lockheed Hanover	Cleanup Program Site	Open – Site Assessment	3251 Hanover Street, Palo Alto, CA 94304
Lockheed Martin Space Systems	Cleanup Program Site	Completed – Case Closed	3170 Porter Drive, Palo Alto, CA 94304
Lockheed Missiles	LUST Cleanup Site	Completed – Case Closed	3251 Hanover Street, Palo Alto, CA 94304
Lucille Packard / Stanford Children's Hospital	Cleanup Program Site	Completed – Case Closed	701 Welch Avenue, Palo Alto, CA 94304
Palo Alto Fire Street #1	LUST Cleanup Site	Completed – Case Closed	301 Alma Street, Palo Alto, CA 94304
Palo Alto Hills Country Club	Permitted Underground Storage Tank (UST)		3000 Alexis Drive, Palo Alto, CA 94304
Palo Alto Hills Country Club	LUST Cleanup Site	Completed – Case Closed	3000 Alexis Drive
Roche Palo Alto LLC	Permitted Underground Storage Tank (UST)		3431 Hillview Avenue, Palo Alto, CA 94304
Skilled Nursing Facility By Hyatt	Permitted Underground Storage Tank (UST)		600 Sand Hill Road, Palo Alto, CA 94304
Stanford Shopping Center	LUST Cleanup Site	Completed – Case Closed	551 Willow Road, Palo Alto, CA 94304
Stanford Shopping Center	LUST Cleanup Site	Completed – Case Closed	527 Willow Road, Palo Alto, CA 94304
Stanford Univ. Med. Center	LUST Cleanup Site	Completed – Case Closed	211 Quarry Road, Palo Alto, CA 94304
Stanford-Mayfield Redevelopment	Cleanup Program Site	Open – Remediation	2450 El Camino Real, Palo Alto, CA 94304
V.A. Medical Center	LUST Cleanup Site	Completed – Case Closed	3801 Miranda Avenue, Palo Alto, CA 94304
VA Palo Alto Health Care System	Permitted Underground Storage Tank (UST)		3801 Miranda Avenue – Bldg. Bunker, Palo Alto, CA 94304
VA Palo Alto Health Care System	Permitted Underground Storage Tank (UST)		3801 Miranda Avenue – Bldg. M/E, Palo Alto, CA 94304

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TABLE E-2 **GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
VA Palo Alto Health Care System	Permitted Underground Storage Tank (UST)		3801 Miranda Avenue – Bldg. 40, Palo Alto, CA 94304
VA Palo Alto Health Care System	Permitted Underground Storage Tank (UST)		3801 Miranda Avenue – Bldg. 50, Palo Alto, CA 94304
VA Palo Alto Health Care System	Permitted Underground Storage Tank (UST)		3801 Miranda Avenue – Bldg. 103, Palo Alto, CA 94304
VA Palo Alto Health Care System	Permitted Underground Storage Tank (UST)		3801 Miranda Avenue – Bldg. 41, Palo Alto, CA 94304
Varian Associates	Cleanup Program Site	Open – Verification Monitoring	601 S. California Avenue, Palo Alto, CA 94304
Varian Associates	Permitted Underground Storage Tank (UST)		3120 Hansen Way, Palo Alto, CA 94304
Watkins Johnson Company	Cleanup Program Site	Open – Inactive	3333 Hillview Avenue, Palo Alto, CA 94304
Beckman Building Generator	Cleanup Program Site	Completed – Case Closed	265 Campus Drive, Stanford, CA 94305
Campus Service	Permitted Underground Storage Tank (UST)		715 Serra Street, Stanford, CA 94305
Galvez Gas Station	LUST Cleanup Site	Completed – Case Closed	900 El Camino Real, Palo Alto, CA 94305
Hoover House	LUST Cleanup Site	Completed – Case Closed	623 Mirada Avenue, Stanford, CA 94305
Mechanical Engineering Building	LUST Cleanup Site	Completed – Case Closed	Me Building 500, Stanford, CA 94305
Mobil	LUST Cleanup Site	Completed – Case Closed	375 Arboretum Road, Palo Alto, CA 94305
Price Residence	LUST Cleanup Site	Completed – Case Closed	694 Alvarado Row, Stanford, CA 94305
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Unincorporated, CA 94305
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Stanford, CA 94305
Private Residence	LUST Cleanup Site	Completed – Case Closed	Private Residence, Stanford, CA 94305

APPENDIX E

TABLE E-2 GEOTRACKER SITES IN THE EIR STUDY AREA

Site/Facility Name	Program Type	Status	Address
Shell	LUST Cleanup Site	Completed – Case Closed	715 Serra Street, Palo Alto, CA 94305
Stanford Archeology Bldg.	Cleanup Program Site	Completed – Case Closed	488 Escondido Mall, Building 500, Stanford, CA 94305
Stanford Bonair Operations & Maintenance Complex	Permitted Underground Storage Tank (UST)		297 Bonair Siding, Stanford, CA 94305
Stanford Central Energy Facility 14-105	Permitted Underground Storage Tank (UST)		288 Campus Drive, Stanford, CA 94305
Stanford Dept. of Public Safety	LUST Cleanup Site	Completed – Case Closed	711 Serra Street, Unincorporated, CA 94305
Stanford University – Applied Physic	LUST Cleanup Site	Completed – Case Closed	1 Via Ortega, Unincorporated, CA 94305
Stanford University, Central Energy	LUST Cleanup Site	Completed – Case Closed	Jordan Way, Stanford, CA 94305
Stanford University	LUST Cleanup Site	Completed – Case Closed	579 Alvarado Row, Stanford, CA 94305
Stanford University	LUST Cleanup Site	Completed – Case Closed	450 Serra Mall, Stanford, CA 94305
Stanford University Fleet Service	LUST Cleanup Site	Completed – Case Closed	315 Bonair Siding Road, Unincorporated, CA 94305
Stanford University/Steamplant	LUST Cleanup Site	Completed – Case Closed	340 Galvez Street, Palo Alto, CA 94305
Wilbur Hall Elevator	Cleanup Program Site	Completed – Case Closed	658 Escondido Road, Stanford, CA 94305
Alta Mesa Memorial Park	LUST Cleanup Site	Completed – Case Closed	695 Arastradero Road, Palo Alto, CA 94306
Arco #0589	LUST Cleanup Site	Completed – Case Closed	1963 El Camino Real, Palo Alto, CA 94306
Arco #0716	LUST Cleanup Site	Completed – Case Closed	699 San Antonio Road, Palo Alto, CA 94306
Arco #1326	LUST Cleanup Site	Completed – Case Closed	840 San Antonio Road, Palo Alto, CA 94306
Arco #4430	LUST Cleanup Site	Completed – Case Closed	2995 Middlefield Road, Palo Alto, CA 94306
Arco Facility # 716	Permitted Underground Storage Tank (UST)		699 San Antonio Road, Palo Alto, CA 94306

APPENDIX E

TABLE E-2 **GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
AT&T/SBC (P1-052)	Permitted Underground Storage Tank (UST)		3350 Birch Street, Palo Alto, CA 94306
Barron Park Shell Service Station	Permitted Underground Storage Tank (UST)		3601 El Camino Real, Palo Alto, CA 94306
Bay Cities Forklift	LUST Cleanup Site	Completed – Case Closed	1001 E Charleston Road, Palo Alto, CA 94306
Beacon #3463	LUST Cleanup Site	Completed – Case Closed	4073 El Camino Real, Palo Alto, CA 94306
Bleibler Iron Works	LUST Cleanup Site	Completed – Case Closed	411 Page Mill Road, Palo Alto, CA 94306
Carmean Trust	LUST Cleanup Site	Completed – Case Closed	411 Acacia Avenue, Palo Alto, CA 94306
Chevron	LUST Cleanup Site	Open – Site Assessment	2799 Middlefield Road, Palo Alto, CA 94306
Chevron #9-3173	LUST Cleanup Site	Completed – Case Closed	3972 El Camino Real, Palo Alto, CA 94306
Chevron #9-6791	LUST Cleanup Site	Completed – Case Closed	3401 Alma Street, Palo Alto, CA 94306
Co-Opt Service Station	LUST Cleanup Site	Completed – Case Closed	3897 El Camino Real, Palo Alto, CA 94306
Combes Auto Repair	LUST Cleanup Site	Open – Verification Monitoring	3585 El Camino Real, Palo Alto, CA 94306
Dura Bond Bearing Co.	LUST Cleanup Site	Completed – Case Closed	3201 Ash Street, Palo Alto, CA 94306
El Camino Center	LUST Cleanup Site	Completed – Case Closed	340 Portage Avenue, Palo Alto, CA 94306
Essex Park Trust	Cleanup Program Site	Open – Site Assessment	2785 Park Boulevard, Palo Alto, CA 94306
Exxon #7-0113	LUST Cleanup Site	Completed – Case Closed	705 San Antonio Road, Palo Alto, CA 94306
Facciola Industrial	LUST Cleanup Site	Completed – Case Closed	911 Industrial Avenue, Palo Alto, CA 94306
Fill'em Fast	LUST Cleanup Site	Completed – Case Closed	1795 El Camino Real, Palo Alto, CA 94306
Former Harmony Bakery	LUST Cleanup Site	Completed – Case Closed	2750 Middlefield Road, Palo Alto, CA 94306

APPENDIX E**TABLE E-2 GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Gavenman Property	LUST Cleanup Site	Completed – Case Closed	3017 El Camino Real, Palo Alto, CA 94306
Green World Nursery	LUST Cleanup Site	Completed – Case Closed	2711 El Camino Real, Palo Alto, CA 94306
Hewlett Packard Company	Cleanup Program Site	Open – Remediation	395 Page Mill Road, Palo Alto, CA 94306
Hohbach	LUST Cleanup Site	Open – Eligible For Closure	200 Page Mill, Palo Alto, CA 94306
Hyatt Rickey's	LUST Cleanup Site	Completed – Case Closed	4219 El Camino Real, Palo Alto, CA 94306
Hyatt Rickey's	LUST Cleanup Site	Open – Inactive	4201 El Camino Real, Palo Alto, CA 94306
Independent BMW	LUST Cleanup Site	Completed – Case Closed	799 Alma Street, Palo Alto, CA 94306
Jim Davis Automotive – Valero Service Station	Permitted Underground Storage Tank (UST)		3972 El Camino Real, Palo Alto, CA 94306
John's Automotive	LUST Cleanup Site	Completed – Case Closed	3508 El Camino Real, Palo Alto, CA 94306
Jost Heating & Sheet Metal	LUST Cleanup Site	Completed – Case Closed	412 Olive Avenue, Palo Alto, CA 94306
Maybell Property	Cleanup Program Site	Completed – Case Closed	567 – 575 Maybell Avenue, Palo Alto, CA 94306
Mercer Processing	Cleanup Program Site	Completed – Case Closed	230 Portage Avenue, Palo Alto, CA 94306
Mobil (Bp 11219)	LUST Cleanup Site	Completed – Case Closed	2780 El Camino Real, Palo Alto, CA 94306
Old Fire Station	LUST Cleanup Site	Completed – Case Closed	2253 Park Boulevard, Palo Alto, CA 94306
Paddlesford Oldsmobile	LUST Cleanup Site	Completed – Case Closed	4230 El Camino Real Avenue, Palo Alto, CA 94306
Palo Alto Chevron Service Station	Permitted Underground Storage Tank (UST)		3897 El Camino Real, Palo Alto, CA 94306
Palo Alto Firestone	LUST Cleanup Site	Completed – Case Closed	3401 El Camino Real, Palo Alto, CA 94306
Palo Alto High School Shop	LUST Cleanup Site	Completed – Case Closed	85 Churchill Avenue, Palo Alto, CA 94306

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TABLE E-2 **GEOTRACKER SITES IN THE EIR STUDY AREA**

Site/Facility Name	Program Type	Status	Address
Palo Alto High School, Auto Shop Building 900	Cleanup Program Site	Completed – Case Closed	50 Embarcadero Road, Palo Alto, CA 94306
Palo Alto Nissan	LUST Cleanup Site	Completed – Case Closed	3001 El Camino Real, Palo Alto, CA 94306
Palo Alto Shell	Permitted Underground Storage Tank (UST)		2200 El Camino Real, Palo Alto, CA 94306
Palo Alto Tire & Brake	LUST Cleanup Site	Completed – Case Closed	306 Cambridge, Palo Alto, CA 94306
Palo Alto Unified School District	LUST Cleanup Site	Completed – Case Closed	85 Churchill Avenue, Palo Alto, CA 94306
Palo Alto Unified School District Transport Yard	Permitted Underground Storage Tank (UST)		85 Churchill Avenue, Palo Alto, CA 94306
Palo Alto Valero	Permitted Underground Storage Tank (UST)		1963 El Camino Real, Palo Alto, CA 94306
Royal Glass & Mirror	LUST Cleanup Site	Completed – Case Closed	450 Cambridge Avenue, Palo Alto, CA 94306
Shell	LUST Cleanup Site	Completed – Case Closed	1885 El Camino Real, Palo Alto, CA 94306
Shell	LUST Cleanup Site	Completed – Case Closed	3011 Middlefield Road, Palo Alto, CA 94306
Shell	LUST Cleanup Site	Completed – Case Closed	3900 Middlefield Road, Palo Alto, CA 94306
Shell – 3601 El Camino	LUST Cleanup Site	Open – Eligible For Closure	3601 El Camino Real, Palo Alto, CA 94306
Stanford Cleaners	Cleanup Program Site	Completed – Case Closed	2875 El Camino Real, Palo Alto, CA 94306
Unknown	LUST Cleanup Site	Completed – Case Closed	1705 El Camino Real, Palo Alto, CA 94306
Vance Brown & Sons	LUST Cleanup Site	Completed – Case Closed	2747 Park Boulevard, Palo Alto, CA 94306
West Bay Cycles	LUST Cleanup Site	Completed – Case Closed	750 San Antonio Road, Palo Alto, CA 94306
Wheatly Associates	LUST Cleanup Site	Completed – Case Closed	890 San Antonio Road, Palo Alto, CA 94306

Source: State Water Resources Control Board, Geo Tracker, October 2015.

APPENDIX E

TABLE E-3 LARGE QUANTITY GENERATORS IN THE EIR STUDY AREA

Site/Facility Name	Address
CVS Pharmacy #3935	855 El Camino Real SP 116, Palo Alto, CA 94301
CVS Pharmacy NO 9915	352 University Avenue, Palo Alto, CA 94301
Palo Alto USD - Palo Alto High School	50 Embarcadero Road, Palo Alto, CA 94301
Shell Service Station-135736	355 Alma Street, Palo Alto, CA 94301
Teledyne Wireless. D/B/A Teledyne MEC	3165 Porter Drive, Palo Alto, CA 94301
Acme Bioscience, Inc.	3941 E. Bayshore Road, Palo Alto, CA 94303
Alveo Energy	4030 Fabian Way, Palo Alto, CA 94303
City of Palo Alto/Water Quality Control Plant	2501 Embarcadero Way, Palo Alto, CA 94303
Compugraphics USA Inc.	821 San Antonio Road, Palo Alto, CA 94303
Crystal Technology, Inc.	1040 East Meadow Circle, Palo Alto, CA 94303
Hammon Plating Corp.	890 Commercial Street, Palo Alto, CA 94303
Materials CTI LLC	1033 through 35 E Meadow Circle, Palo Alto, CA 94303
Space Systems Loral B4	3825 Fabian Way, Palo Alto, CA 94303
Space Systems Loral Bldg 50	1340 W Middlefield Road, Palo Alto, CA 94303
Specific Plating Company	936 Industrial Avenue, Palo Alto, CA 94303
Communications & Power Industries	607 Hansen Way, Palo Alto, CA 94304
DPIX LLC	3406 Hillview Avenue, Palo Alto, CA 94304
Genencor International	925 Page Mill Road, Palo Alto, CA 94304
Gilead Palo Alto, Inc.	3172 Porter Drive, Palo Alto, CA 94304
Hewlett Packard Co	1501 Page Mill Road, Palo Alto, CA 94304
Hewlett Packard Co	640 Page Mill Road, Palo Alto, CA 94304
Lockheed Martin Space Systems Company	3251 Hanover Street, Palo Alto, CA 94304
Merck Sharp & Dohme Corp	901 S California Avenue, Palo Alto, CA 94304
Nanosys	2625 Hanover Street, Palo Alto, CA 94304
PARC Palo Alto Research Center	3333 Coyote Hill Road, Palo Alto, CA 94304
Stanford Hospital & Clinics Hillview Lab	3375 Hillview Avenue, Palo Alto, CA 94304
Stanford University at Arastradero Road	1050 Arastradero Road, Palo Alto, CA 94304

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TABLE E-3 LARGE QUANTITY GENERATORS IN THE EIR STUDY AREA

Site/Facility Name	Address
Tesla Motors Inc.	3500 Deer Creek Road, Palo Alto, CA 94304
	3801 Miranda Avenue, Palo Alto, CA 94304
Service Station – SAP 135742	3601 El Camino, Palo Alto, CA 94306
Stanford Hospital & Clinics	300 Pasteur Drive, MC: 5788, Stanford, CA 94305
Stanford Univ School Of Medicine	3155 Porter Drive, Palo Alto, CA 94306
Stanford University	480 Oak Road, Stanford, CA 94305

Source: United States Environmental Protection Agency, RCRAInfo, October 2015.

APPENDIX E**TABLE E-4 SMALL QUANTITY GENERATORS IN THE EIR STUDY AREA**

Site/Facility Name	Address
Abacus Auto Body	1001 Emerson Avenue, Palo Alto, CA 94301
Cardinal Drive In Cleaners	203 Forest, Palo Alto, CA 94301
City Of Paris Cleaners	248 Homer Avenue, Palo Alto, CA 94301
Compaq Computer Corp Alta Vista	529 Bryant Street, Palo Alto, CA 94301
D&M Motors	190 Channing Street, Palo Alto, CA 94301
Ellisons Body Shop	705 Alma Street, Palo Alto, CA 94301
Emerson Cleaners	935 Emerson Street, Palo Alto, CA 94301
Heinichens Garage	960 High Street, Palo Alto, CA 94301
Honda Small Car	111 Homer Street, Palo Alto, CA 94301
Ideo LLC	100 Forest Avenue, Palo Alto, CA 94301
Junglecopy	542 High Street, Palo Alto, CA 94301
Martha Pauline Swain Trustee	451 University Avenue, Palo Alto, CA 94301
Oles Car Shop Inc.	801 Alma Street, Palo Alto, CA 94301
One Hour Martinizing	855 El Camino Real #42, Palo Alto, CA 94301
Pacific Bell	345 Hamilton Avenue, Palo Alto, CA 94301
Palo Alto Medical Foundation	860 Bryant, Palo Alto, CA 94301
Palo Alto Medical Foundation	735 Emerson, Palo Alto, CA 94301
Palo Alto Medical Foundation	795 El Camino Real, Palo Alto, CA 94301
Palo Alto Office Center	525 University Avenue, Palo Alto, CA 94301
Photo Express	479 University Avenue, Palo Alto, CA 94301
Taube Koret Campus For Jewish Life	901 San Antonio Road, Palo Alto, CA 94301
Tidy Town Cleaners	163 Everett Avenue, Palo Alto, CA 94301
Town and Country Cleaners	42 Town and Country Village, Palo Alto, CA 94301
Advalloy Inc.	844 E Charleston Road, Palo Alto, CA 94303
Alexza Molecular Delivery Corp.	1001 E Meadow Circle, Palo Alto, CA 94303
Alza Corporation B/D	2575 Hanover Street, Palo Alto, CA 94303
Anacor Pharmaceutical Inc.	102 E Meadow Circle, Palo Alto, CA 94303

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TABLE E-4 **SMALL QUANTITY GENERATORS IN THE EIR STUDY AREA**

Site/Facility Name	Address
Arabian Horse World Magazine	824 San Antonio Road, Palo Alto, CA 94303
Biomerix Corporation	3520 West Bayshore, Palo Alto, CA 94303
Cavallino Rampante, Ltd.	1880 W Bayshore Boulevard, Palo Alto, CA 94303
Clontech Laboratories Inc.	4030 Fabian Way, Palo Alto, CA 94303
Clontech Labs Inc.	4062 Fabian Way Building 2, Palo Alto, CA 94303
Coherent Medical Group	3270 W Bayshore Road, Palo Alto, CA 94303
Crescent Cleaners	1930 University Avenue, Palo Alto, CA 94303
Duo Type	953 Industrial Avenue, Suite 113, Palo Alto, CA 94303
Electrite Plating Company Inc.	1805 Bay Road, Palo Alto, CA 94303
Ford Aerospace Corp.	3910 Fabian Way, Palo Alto, CA 94303
Ford Aerospace Corp.	1085 E Meadow Circle, Palo Alto, CA 94303
Kapco Tool And Engineering Inc.	925 Commercial Street, Palo Alto, CA 94303
Litz Engine Supply Inc.	4225 Middlefield Road, Palo Alto, CA 94303
Maaco Auto Painting and Bodywork	816 San Antonio Road, Palo Alto, CA 94303
Medluminal Systems	2454 Embarcadero Way, Palo Alto, CA 94303
Micro Magnetic Industries Inc.	969 Commercial Street, Palo Alto, CA 94303
Microfab Systems Corp.	3960 Fabian Way, Palo Alto, CA 94303
Nanosolar	3961 E Bayshore Road, Palo Alto, CA 94303
Oligasis LLC	3350 W Bayshore Road, Palo Alto, CA 94303
Palo Alto City Dept of Utilities	3201 E Bayshore, Palo Alto, CA 94303
Quantel	3290 W Bayshore, Palo Alto, CA 94303
Rosenthal Service	4020 Fabian Way, Palo Alto, CA 94303
Rossi Aircraft Inc.	1903 Embarcadero Road, Palo Alto, CA 94303
Shell Oil Co.	811 Charleston, Palo Alto, CA 94303
Shell Oil Co.	1161 Embarcadero, Palo Alto, CA 94303
Space Systems Loral	928 E Meadow Circle, Building 28, Palo Alto, CA 94303
Space Systems Loral	1010 E Meadow Circle, Building 17, Palo Alto, CA 94303

APPENDIX E**TABLE E-4 SMALL QUANTITY GENERATORS IN THE EIR STUDY AREA**

Site/Facility Name	Address
Space Systems Loral LLC Building 12	1036 E Meadow Circle, Palo Alto, CA 94303
Space Systems Loral LLC Building 47	2598 Bayshore Parkway, Mountain View, CA 94303
Space Systems Loral LLC Building 8	3877 Fabian Way, Palo Alto, CA 94303
Space Systems Loral LLC Building 45	1058 Elwell Court, Palo Alto, CA 94303
Sud Chemie	3350 W Bayshore Road, Palo Alto, CA 94303
Symtron Corp Palo Alto Division	4019 Transport Street, Palo Alto, CA 94303
Systemix Inc.	3400 W Bayshore, Palo Alto, CA 94303
Techne Electronics, Ltd.	916 Commercial Street, Palo Alto, CA 94303
Yeaman Auto Body	2025 E Bayshore, Palo Alto, CA 94303
3176 Porter Drive Remediation Site	3176 Porter Drive, Palo Alto, CA 94304
Addiction Research Foundation	701 Welch Road #325, Palo Alto, CA 94304
Agilent Technologies Inc..	1601 California Avenue, Palo Alto, CA 94304
Aydin Energy Division	3180 Hanover, Palo Alto, CA 94304
Beckman Coulter Inc.	1050 Page Mill Road, Palo Alto, CA 94304
Chemocentryx	2631 Hanover Street, Palo Alto, CA 94304
Children's Hospital at Stanford	520 Sandhill Road, Palo Alto, CA 94304
Coherent Inc.	3210 Porter Drive, Palo Alto, CA 94304
Gyricon Media Inc.	3333 Coyote Hill Road, Palo Alto, CA 94304
Hewlett Packard Co	3500 Deer Creek Road, Palo Alto, CA 94304
Hewlett-Packard, Mfg Printed Circuits	3215 Porter Drive, Palo Alto, CA 94304
Intevac	601 California Avenue, Palo Alto, CA 94304
Kits Cameras 1 Hour No 50	189 Stanford Shopping Center, Palo Alto, CA 94304
Lockheed Missiles & Space Company	3176 Porter Drive B252, Palo Alto, CA 94304
Lockheed Missles & Space Company	3170 Porter Drive, Palo Alto, CA 94304
National Press Inc.	850 Hansen Way, Palo Alto, CA 94304
Novellus Systems	3175 Hanover Street, Palo Alto, CA 94304
Oread Inc.	3401 P Hillview Avenue, Palo Alto, CA 94304

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TABLE E-4 SMALL QUANTITY GENERATORS IN THE EIR STUDY AREA

Site/Facility Name	Address
Palo Alto Firestone	3401 El Camino Real, Palo Alto, CA 94304
Parks Dry Cleaners	385 Stanford Shopping Center, Palo Alto, CA 94304
Quality Technologies Corp.	3400 Hillview Avenue, Palo Alto, CA 94304
Ravenswood Substation	Willow Rd .5 Miles W of Menlo Park, CA 94304
Sephora Store48 Stanford	355 Stanford Shopping Center, Palo Alto, CA 94304
Stanford DNA Seq. Ctr.	855 California Avenue, Palo Alto, CA 94304
Stanford Shopping Center	180 El Camino Real, Palo Alto, CA 94304
Stanford University	975 California Avenue, Palo Alto, CA 94304
Stanford University Blood Center	3373 Hillview Avenue, Palo Alto, CA 94304
Stanford University Genome	4005 Miranda Avenue, Palo Alto, CA 94304
Stiefel West Coast LLC	3160 Porter Drive, Palo Alto, CA 94304
Sungene Technologies Corp	3330 Hillview Avenue, Palo Alto, CA 94304
Syntex USA Inc.	3410 Hillview Avenue, Building A3, Palo Alto, CA 94304
Syva/Syntex Diagnostic Division	3221 Porter Drive, Palo Alto, CA 94304
Syva/Syntex Medical Diagnostics	3300 Hillview Avenue, Palo Alto, CA 94304
VMS 601 CAGWTS	601 California Avenue Remediation, Palo Alto, CA 94304
Varian Medical Systems Palo Alto	3120 Hansen Way, Palo Alto, CA 94304
Varian Oncology Systems	911 Hansen Way, Palo Alto, CA 94304
WJ Communications, Inc..	3333 Hillview Avenue, Palo Alto, CA 94304
Wolf Camera No 955	3159 El Camino Real, Palo Alto, CA 94304
Stanford University – 613A1	Near corner, Campus Drive/Panama, Stanford, CA 94305
Stanford University Bookstore	515 Lasuen Street, Stanford, CA 94305
AJ's Quick Cleaners	3175 Middlefield Road, Palo Alto, CA 94306
Akins Body Shop Inc.	2901 Park Boulevard, Palo Alto, CA 94306
BIX	2891 Park Boulevard, Palo Alto, CA 94306
BP West Coast Products LLC 4430	2995 Middlefield, Palo Alto, CA 94306
Carlsen Subaru	4190 El Camino, Palo Alto, CA 94306

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TABLE E-4 SMALL QUANTITY GENERATORS IN THE EIR STUDY AREA

Site/Facility Name	Address
Corning Glass Works Palo Alto	490 San Antonio Road, Palo Alto, CA 94306
DOHS Santa Clara County	231 Grant Avenue, Palo Alto, CA 94306
Dura-Bond Bearing Company	395 Portage, Palo Alto, CA 94306
Helmings Auto Repair	300 Lambert Avenue, Palo Alto, CA 94306
Hewlett Packard Manufacturing Division	395 Page Mill Road, Palo Alto, CA 94306
Keeble and Shuchat Photography	290 California Avenue, Palo Alto, CA 94306
Linus Pauling Institute	440 Page Mill Road, Palo Alto, CA 94306
Lutz Ford	4180 El Camino Real, Palo Alto, CA 94306
Pacific Bell	3350 Birch Street, Palo Alto, CA 94306
Palo Alto Nissan Inc.	411 Acacia, Palo Alto, CA 94306
Palo Alto One Hour Martinizing	3886 El Camino Real, Palo Alto, CA 94306
Palo Alto School	85 Churchill Avenue, Palo Alto, CA 94306
Park Avenue Motors	3250 Park Boulevard, Palo Alto, CA 94306
Park Avenue Motors	3241 Park Avenue, Palo Alto, CA 94306
Preformed Line PCDT	600 Hansen Way, Palo Alto, CA 94306
Say Ray	3251 Ash Street, Palo Alto, CA 94306
Shell Service Station	2200 El Camino Real, Palo Alto, CA 94306
Stanford Cleaners	2875 El Camino Real, Palo Alto, CA 94306
Stanford Nissan Inc.	473 Acacia, Palo Alto, CA 94306
Systems Control Inc.	220 Portage, Palo Alto, CA 94306
Toyota of Palo Alto	690 San Antonio Road, Palo Alto, CA 94306
Varian Associates – Lambert Site	425 Lambert, Palo Alto, CA 94306
Walgreens #3344	4170 El Camino Real, Palo Alto, CA 94306

Source: United States Environmental Protection Agency, RCRAInfo, October 2015.

APPENDIX E

TABLE E-5 SITES SUBJECT TO CORRECTIVE ACTION IN THE EIR STUDY AREA

Site/Facility Name	Address
1990 Bay Road	1990 Bay Road, East Palo Alto, CA 94303
Bay Road Holdings	2081 Bay Road, East Palo Alto, CA 94303
Space Systems Loral B4	3825 Fabian Way, Palo Alto, CA 94303
Communications & Power Industries	607 Hansen Way, Palo Alto, CA 94304
Hewlett Packard Co	1501 Page Mill Road, Palo Alto, CA 94304
Lockheed Martin Space Systems Company	3251 Hanover Street, Palo Alto, CA 94304
Quality Technologies Corp.	3400 Hillview Avenue, Palo Alto, CA 94304
Varian Medical Systems Palo Alto	3120 Hansen Way, Palo Alto, CA 94304
Stanford University 613A1	Near corner Campus Drive/Panama, Stanford, CA 94305
Stanford University	480 Oak Road, Stanford, CA 94305

Source: United States Environmental Protection Agency, RCRAInfo, October 2015.

A P P E N D I X F

NOISE REGULATIONS,
TECHNICAL NOISE DATA,
AND NOISE MODELING

 Chapter 9.10

NOISE *

Sections:

[9.10.010](#) Declaration of policy.

[9.10.020](#) Definitions.

[9.10.030](#) Residential property **noise** limits.

[9.10.040](#) Commercial and industrial property **noise** limits.

[9.10.050](#) Public property **noise** limits.

[9.10.060](#) Special provisions.

[9.10.070](#) Exception permits.

[9.10.080](#) Violations.

* Editor's Note: Prior ordinance history: Ordinances 2664, 3609, 3640, 3751, 3763, 3790, 3881, 4453.

 9.10.010 Declaration of policy.

It is hereby declared to be the policy of the city that the peace, health, safety and welfare of the citizens of Palo Alto require protection from excessive, unnecessary and unreasonable **noises** from any and all sources in the community. It is the intention of the city council to control the adverse effect of such **noise** sources on the citizen under any condition of use, especially those conditions of use which have the most severe impact upon any person.

(Ord. 4634 § 2 (part), 2000)

 9.10.020 Definitions.

For the purposes of this chapter, certain terms are defined as follows:

(a) "Sound level," expressed in decibels (dB), means a logarithmic indication of the ratio between the acoustic energy present at a given location and the lowest amount of acoustic energy audible to sensitive human ears and weighted by frequency to account for characteristics of human hearing, as given in the American National Standards Institute Standard S1.1, "Acoustic Terminology," paragraph

2.9, or successor reference. All references to dB in this chapter utilize the A-level weighting scale, abbreviated dBA, measured as set forth in this section.

(b) "Precision sound level meter" means a device for measuring sound level in decibel units within the performance specifications in the American National Standards Institute Standard S1.4, "Specification for Sound Level Meters."

(c) "**Noise** level" means the maximum continuous sound level or repetitive peak sound level, produced by a source or group of sources as measured with a precision sound level meter. In order to measure a **noise** level, the controls of the precision sound level meter should be arranged to the setting appropriate to the type of **noise** being measured.

(d) "Local ambient" means the lowest sound level repeating itself during a six-minute period as measured with a precision sound level meter, using slow response and "A" weighting. The minimum sound level shall be determined with the **noise** source at issue silent, and in the same location as the measurement of the **noise** level of the source or sources at issue. However, for purposes of this chapter, in no case shall the local ambient be considered or determined to be less than: (1) Thirty dBA for interior **noise** in Section [9.10.030\(b\)](#); (2) Forty dBA in all other sections. If a significant portion of the local ambient is produced by one or more individual identifiable sources which would otherwise be operating continuously during the six-minute measurement period and contributing significantly to the ambient sound level, determination of the local ambient shall be accomplished with these separate identifiable **noise** sources silent.

(e) "Vehicle" means any device by which any person or property may be propelled, moved, or drawn upon a highway or street.

(f) "Property plane" means a vertical plane including the property line which determines the property boundaries in space.

(g) "Emergencies" mean essential activities necessary to restore, preserve, protect or save lives or property from imminent danger of loss or harm.

(h) "Leaf blower" means any portable machine used to blow leaves, dirt and other debris off sidewalks, driveways, lawns or other surfaces.

(i) "Residential power equipment" means any mechanically powered saw, sander, drill, grinder, generator, lawnmower, hedge trimmer, edger, or any other similar tool or device (other than leaf blowers).

(j) "Residential zone" means all lands located within the following zoning districts: RE, R1, R2, RMD, RM-15, RM-30, and RM-40; "residential zone" also means any lands located within Planned Community (PC) zoning districts actually used for authorized residential purposes. Any zoning district other than those defined as residential zones are classified as non-residential zones for purposes of this chapter.

(k) "Holiday" means and includes New Year's Day (January 1), Martin Luther King Day (the third Monday in January), Washington's Birthday (the third Monday in February), Memorial Day (the last Monday in May), Independence Day (July 4), Labor Day (the first Monday in September), Columbus Day (the second Monday in October), Veteran's Day (November 11), Thanksgiving Day (the fourth Thursday in November), and Christmas Day (December 25).

(Ord. 4634 § 2 (part), 2000)

9.10.030 Residential property noise limits.

(a) No person shall produce, suffer or allow to be produced by any machine, animal or device, or any combination of same, on residential property, a **noise** level more than six dB above the local ambient at any point outside of the property plane.

(b) No person shall produce, suffer or allow to be produced by any machine, animal, or device, or any combination of same, on multi-family residential property, a **noise** level more than six dB above the local ambient three feet from any wall, floor, or ceiling inside any dwelling unit on the same property, when the windows and doors of the dwelling unit are closed, except within the dwelling unit in which the **noise** source or sources may be located.

(Ord. 4634 § 2 (part), 2000)

9.10.040 Commercial and industrial property noise limits.

No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on commercial or industrial property, a **noise** level more than eight dB above the local ambient at any point outside of the property plane.

(Ord. 4634 § 2 (part), 2000)

9.10.050 Public property noise limits.

(a) No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on public property, a **noise** level more than fifteen dB above the local ambient at a distance of twenty-five feet or more, unless otherwise provided in this chapter.

(b) Sound performances and special events not exceeding eighty dBA measured at a distance of fifty feet are exempt from this chapter when approval therefor has been obtained from the appropriate governmental entity, except as provided in Section [22.04.180](#) of this code.

(c) Vehicle horns or other devices primarily intended to create a loud **noise** for warning purposes, shall not be used when the vehicle is at rest, or when a situation endangering life, health or property is not imminent.

(Ord. 4634 § 2 (part), 2000)

9.10.060 Special provisions.

The special exceptions listed in this section shall apply, notwithstanding the provisions of Sections [9.10.030](#) through [9.10.050](#).

Said exceptions shall apply only to the extent and during the hours specified in each of the following enumerated exceptions.

(a) General Daytime Exception. Any **noise** source which does not produce a **noise** level exceeding seventy dBA at a distance of twenty-five feet under its most noisy condition of use shall be exempt from the provisions of Sections [9.10.030\(a\)](#), [9.10.040](#) and [9.10.050\(a\)](#) between the hours of eight a.m. and eight p.m. Monday through Friday, nine a.m. and eight p.m. on Saturday, except Sundays and holidays, when the exemption herein shall apply between ten a.m. and six p.m.

(b) Construction. Except for construction on residential property as described in subsection (c) of this section, construction, alteration and repair activities which are authorized by valid city building permit shall be prohibited on Sundays and holidays and shall be prohibited except between the hours of eight a.m. and six p.m. Monday through Friday, nine a.m. and six p.m. on Saturday provided that the construction, demolition or repair activities during those hours meet the following standards:

(1) No individual piece of equipment shall produce a **noise** level exceeding one hundred ten dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made out-side the structure at a distance as close to twenty-five feet from the equipment as possible.

(2) The **noise** level at any point outside of the property plane of the project shall not exceed one hundred ten dBA.

(3) The holder of a valid construction permit for a construction project in a non-residential zone shall post a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, materialmen and all other persons at the construction site, of the basic requirements of this chapter.

(A) Said sign(s) shall be posted at least five feet above ground level, and shall be of a white background, with black lettering, which lettering shall be a minimum of one and one-half inches in height.

(B) Said sign shall read as follows:

CONSTRUCTION HOURS
FOR NON-RESIDENTIAL PROPERTY

(Includes Any and All Deliveries)

MONDAY - FRIDAY.....8:00 a.m. to 6:00 p.m.

SATURDAY.....9:00 a.m. to 6:00 p.m.

SUNDAY/HOLIDAYS.....Construction prohibited.

Violation of this Ordinance is a misdemeanor punishable by a maximum of six months in jail, \$1,000 fine, or both. Violators will be prosecuted. P.A.M.C. § [9.10.060](#)(b).

(c) Construction on Residential Property. Construction, alteration, demolition or repair activities conducted in a residential zone, authorized by valid city building permit, shall be prohibited on Sundays and holidays and is prohibited on all other days except during the hours of eight a.m. and six p.m. Monday through Friday, nine a.m. and six p.m. on Saturday, provided that the construction, demolition or repair activities during those hours meet the following standards:

(1) No individual piece of equipment shall produce a **noise** level exceeding one hundred ten dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty-five feet from the equipment as possible.

(2) The **noise** level at any point outside of the property plane of the project shall not exceed one hundred ten dBA.

(3) The holder of a valid building permit for a construction project located within any residential zone shall post a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, materialmen and all other persons at the construction site, of the basic requirements of this chapter.

(A) Said sign(s) shall be posted no less than three feet and no more than five feet above ground level, shall be visible from the adjacent street, and shall be of a white background, with black lettering, which lettering shall be a minimum of one and one-half inches in height.

(B) Said sign shall read as follows:

CONSTRUCTION HOURS

FOR RESIDENTIAL PROPERTIES

(includes any and all deliveries)

MONDAY-FRIDAY.....8:00 a.m. to 6:00 p.m.

SATURDAY.....9:00 a.m. to 6:00 p.m.

SUNDAY/HOLIDAYS.....Construction Prohibited.

Violation of this Ordinance is a misdemeanor punishable by a maximum of six months in jail, \$1,000 fine, or both. Violators will be prosecuted. P.A.M.C. § [9.10.060](#)(b).

(d) Other Equipment. Equipment used by city employees, city contractors, or public utility companies or their contractors, not covered by subsections (b) and (c) of this section, shall be allowed during the same hours as the exception set forth in subsection (b) of this section, providing no piece of equipment shall produce a **noise** level which exceeds one hundred ten dBA, measured at a distance of twenty-five feet from the equipment.

(e) Residential Power Equipment. Residential power equipment shall be allowed during the hours of eight a.m. and eight p.m. Monday through Friday, nine a.m. and six p.m. Saturday, and ten a.m. and six p.m. on Sundays and holidays, providing it does not produce a **noise** level that exceeds ninety-five dBA measured at twenty-five feet from the equipment and is not being operated for construction regulated in subsections (b) or (c) of this section.

(f) Leaf Blowers.

(1) No person shall operate any leaf blower which does not bear an affixed manufacturer's label indicating the model number of the leaf blower and designating a **noise** level not in excess of sixty-five dBA when measured from a distance of fifty feet utilizing American National Standard Institute methodology. Any leaf blower which bears such a manufacturer's label shall be presumed to comply with any **noise** level limit of this chapter provided that it is operated with all mufflers and full extension tubes supplied by the manufacturer for that leaf blower. No person shall operate any leaf blower without attachment of all mufflers and full extension tubes supplied by the manufacturer for that leaf blower.

(2) No person shall operate any leaf blowers within a residential zone except during the following hours: nine a.m. and five p.m. Monday through Friday and ten a.m. and four p.m. Saturday. No person shall operate any leaf blower within any non-residential zone except during the following hours: eight a.m. and six p.m. Monday through Friday, and ten a.m. to four p.m. Saturday. No person shall operate any leaf blowers on Sundays and holidays. No person shall operate any leaf blower powered by an internal combustion engine within any residential zone after July 1, 2005. Commercial operators of leaf blowers are prohibited from operating any leaf blower within the city if they do not prominently display a certificate approved by the Chief of Police verifying that the operator has been trained to operate leaf blowers according to standards adopted by the Chief of Police. In addition to all authorizations and restrictions otherwise provided in this chapter, public streets, sidewalks, and parking lots in business districts and at the Municipal Golf Course and all city parks may be cleaned between 4:00 a.m. and 8:00 a.m. using leaf blowers which bear an affixed manufacturer's label indicating the model number of the leaf blower and designating a **noise** level not in excess of sixty-five dBA when measured from a distance of fifty feet utilizing American National Standard Institute methodology.

(g) Street Sweeping. Street sweeping activities are allowed between the hours of ten p.m. and eight a.m. daily, provided they do not produce a **noise** level in excess of ninety dBA, when measured at a distance of twenty-five feet from the street sweeper.

(h) Refuse Collection. Refuse collection activities shall be permitted between the hours of four a.m. and nine p.m. daily, provided they do not produce a **noise** level in excess of ninety-five dBA measured at a distance of twenty-five feet from the activity.

(i) Safety Devices. Aural warning devices which are required by law to protect the health, safety and welfare of the community shall not produce a **noise** level more than three dBA above the standard or minimum level stipulated by law.

(j) Emergencies. Emergencies are exempt from this chapter.

(k) Public Parking Lot Cleaning. Cleaning equipment (other than leaf blowers), when used in public parking lots, shall be allowed during the hours of ten p.m. and eight a.m. daily, providing no such piece of equipment shall produce a **noise** level that exceeds ninety dBA measured at a distance of twenty-five feet.

(l) Business District Street Cleaning. Cleaning equipment (other than leaf blowers), when used in public streets and public sidewalks within the public right-of-way in business districts shall be allowed during the hours of ten p.m. and eight a.m. daily, providing no such piece of equipment shall produce a **noise** level that exceeds ninety dBA measured at a distance of twenty-five feet.

(Ord. 4778 §§ 2, 3, 2003: Ord. 4754 § 2, 2002: Ord. 4727 § 2, 2002: Ord. 4634 § 2 (part), 2000)

9.10.070 Exception permits.

If the applicant can show to the city manager or his designee that a diligent investigation of available **noise** abatement techniques indicates that immediate compliance with the requirements of this chapter would be impractical or unreasonable, a permit to allow exception from the provisions contained in all or a portion of this chapter may be issued, with appropriate conditions to minimize the public detriment caused by such exceptions. Any such permit shall be of as short duration as possible up to six months, but renewable upon a showing of good cause, and shall be conditioned by a schedule for compliance and details of methods therefor in appropriate cases. Any person aggrieved with the decision of the city manager or his designee may appeal to the city council pursuant to Section [16.40.080](#) of this code.

(Ord. 4634 § 2 (part), 2000)

9.10.080 Violations.

Any person who violates Section [9.10.060](#)(e) or 9.10.060(f) shall be guilty of an infraction. Any person who violates any of the other provisions of this chapter shall be guilty of a misdemeanor.

(Ord. 4634 § 2 (part), 2000)

18.23.060 Noise and Vibration

(A) Purpose

The requirements and guidelines regarding noise and vibration impacts are intended to protect residentially zoned properties or properties with existing residential uses located within nonresidential zones (residential properties) from excessive and unnecessary noises and/or vibrations from any sources in abutting industrial or commercially zoned properties. Design of new projects should reduce noise from parking, loading, and refuse storage areas and from heating, ventilation, air conditioning apparatus, and other machinery on nearby residential properties. New equipment, whether mounted on the exterior of the building or located interior to a building, which requires only a building permit, shall also be subject to these requirements.

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(C) Guidelines

(iv) All uses within 150 feet of a residential property should be operated as not to generate vibration discernible without instruments at or beyond the lot line upon which the source is located or within adjoining enclosed space if more than one establishment occupies a structure. Vibration caused by motor vehicles, trains, and temporary construction or demolition work is exempted from this standard.

(Ord. 4933 § 4 (part), 2007)

Santa Clara County General Plan

Health and Safety Element

Book A: Countywide Issues and Policies

Book B: Rural Unincorporated Area Issues and Policies



Noise

Summary

All citizens are entitled to a peaceful and quiet environment, free from unnecessary and annoying levels of noise. Noise has been shown to interfere with speech, sleep and mental concentration, induce stress and headaches, and disrupt overall efficiency and enjoyment of life. It is, therefore, in the public interest that the County and the cities evaluate techniques and develop policies which provide for an environment free from noise which may be hazardous to public health and well-being.

Santa Clara County and the cities should strive to ensure an environment for all residents that is free from noise that jeopardizes public health and well-being. Toward that end, the strategies focus on three areas:

- Preventing or Mitigating Unwanted Noise
- Providing Adequate Sound Buffers
- Minimizing Exposure to Airport Noise

Background

Noise is unwanted sound. The impacts of noise can be annoying and physically harmful. Exposure to intense noise may lead to irreversible hearing damage, and may induce other health problems due to stress. The effects of noise build up over time, so it is necessary to deal not only with the intensity of sound but also the duration of exposure which people have to the sound.

ACHIEVING NOISE COMPATIBILITY

The ideal is complete separation of noise sensitive uses from noise generating sources. This approach is most effective in large scale, mixed use or planned developments. Given that all types of land uses must coexist within the county's urban areas, the planning challenge is in achieving adequate noise compatibility.

For Santa Clara County, an important part of planning for a healthy and safe environment is the avoidance of unnecessary transportation-related noises. Within areas identified as being impacted by noise, it will be necessary to design projects to be compatible with the specific types of noise impacting the site.

FUTURE NOISE CHALLENGES

Noise reduction techniques can be designed and built into new construction. We will need to use these techniques and to develop new ones for addressing noise as the county matures into a community with a more urban character.

State law mandates that each community's general plan be consistent with local ALUC Plans. The most effective way to ensure consistency is to defer to ALUC policies and standards for development on or adjacent to county airports. The strategies encourage the County and cities to do so.

NOISE SOURCES – POINT AND LINE

Noise sources are divided into two categories: point sources and line sources. Point sources emanate from a single point, whether stationary or moving. Line sources emanate from a steady stream of sound. As one moves away from a sound source, the sound level gradually decreases or attenuates. Aside from distance, a sound may be attenuated by objects which shield a potential receiver from unwanted sound.



Measuring Noise

Three common measures of sound form the basis of County standards discussed in this section: Day-Night Average Sound Level (DNL), Community Noise Equivalent Level (CNEL), and A-weighted Sound Level (dB).

The level of sound that impacts a property varies greatly during the day. As an example, the sound near an airport may be relatively quiet when no airplane is taking off or landing, but will be extremely loud as a plane takes off. In order to deal with these variations, several noise indices have been developed which measure how loud each sound is, how long it lasts, and how often the sound occurs. The indices express all the sound occurring during the day as a single average level, which if it occurred all day would convey the same sound energy to the site.

The sound indices most commonly used to describe environmental noise are the Day-Night Average Sound Level (DNL) and the Community Noise Equivalent Level (CNEL). When calculating the 24-hour average of sound in an area, these two indices respond to the community's preference for a quieter environment in the evening and nighttime hours by assigning penalties to noises which occur during those specified hours prior to calculating the average. Both indices place a 10 dB penalty on all noises occurring from 10:00 p.m. to 7:00 a.m. The CNEL calculation varies in that it also places a 5 dB penalty on noise events during evening hours (7:00 p.m. to 10:00 p.m.). The two systems yield generally similar results and are used interchangeably.

In this General Plan, noise standards are expressed as DNL levels, as recommended by the Environmental Protection Agency (EPA) for community noise planning. Santa Clara County's Airport Land Use Commission expresses its standards in terms of CNEL values, as is commonly practiced in California.

Sound is measured in decibels (dB) using a special meter. The decibel scale of sound is logarithmic. Each increase of 10 dB means that the acoustical energy is multiplied by 10 - a sound of 70 dB is 10 times as intensive as one of 60 dB. However, the relative loudness of sound as perceived by the human ear does not closely match the actual relative amounts of sound energy. For example, while 70 dB is physically 10 times as intensive as 60 dB, listeners tend to judge it as only twice as loud.

In 1974, the County conducted a survey to determine the impact of noise. It was found that the major areas affected by noise are those associated with transportation: streets, freeways, rail lines, and airports. The County has previously identified areas experiencing noise levels of 55 dB DNL or greater as "noise impact areas". Noise impact areas exist in connection with all of the identified sources.

In general, the lands not affected by transportation had readings in the 40 to 55 DNL range, with remote parks having readings in the very low range below 40 DNL. In rural areas, general noise levels are low but specific noises are often extremely annoying (i.e., blasting from quarries, shooting ranges, power boats, and off-road vehicles may disturb the serenity of an area without significantly affecting the day-long average readings of the DNL scale.)

Noises generated by transportation are by far the most significant and persistent countywide. The affected areas along freeways and near airports have been mapped by the State of California, by the County Transportation Agency, and by the ALUC. In addition, the County noise survey indicated a pattern of noise impact along several county highways.

(Maps delineating Noise Contours along significant county transportation corridors are available at the Santa Clara County Planning Office.)

STANDARDS FOR LAND USE COMPATIBILITY WITH NOISE

Two tables, the "Noise Compatibility Standards for Land Use in Santa Clara County" and the "Satisfactory Interior Noise Levels," were developed to set the levels of noise which are compatible with the performance and enjoyment of different classes of land use. The standards include both exterior and interior levels of sound.

Standards such as these should be used in the review of subdivisions, building sites, architectural and site approval permits, use permits, and zone changes in areas subject to noise impacts. Each of these standards is intended to protect the people on site from noise coming from



outside sources, and to prevent new projects from generating adverse noise levels on adjacent properties.

The Noise Compatibility Standards for exterior noise specify three classifications of compatibility between ambient noise levels at the site and various land uses: satisfactory, cautionary, and critical (see Figure). These standards serve as a preliminary analysis of potential noise incompatibility and serve to protect the proposed development from existing noise sources.

Noise studies and possible attenuation procedures will also be imposed on the project if the project itself is considered a source of incompatible noise for a nearby land use.

The noise compatibility levels are defined as follows:

- Satisfactory noise levels are those which pose no serious threat to the proposed land use. The ambient noise level at the site is compatible with the land use category of the proposed project and will not create annoyance and/or activity interference. Standard construction techniques will be adequate.
- Cautionary noise levels are those which could potentially pose a threat to the proposed land use. The ambient noise level is great enough to require study on the compatibility of the proposed project. Normal building methods may not be adequate to protect the use.
- Critical noise levels are those which probably pose a threat to the proposed land use. The ambient noise level is severe. The situation requires rigorous analysis of the compatibility of the proposed project with the ambient noise level at the site. This analysis should include both exterior and interior impacts. Simple solutions to noise attenuation may not be adequate and uses should be allowed only if they have been designed for noise reduction by a professional who is competent in sound reduction.

The standards for interior noise levels express the level above which the functioning of the allowed use would be impaired (see Figure). Noise within commercial and industrial structures is additionally regulated by the state and federal governments to protect employees from harmful noise exposure. Within residences, the occupants may impose much higher noise levels on themselves (loud stereos, etc.) so long as they do not affect their neighbors. The point of the interiors standards is to assure that people are not normally subjected to annoying or damaging noise which they can not control.

The Noise Compatibility Standards indicate that most land uses are satisfactory in noise environments of less than 55 DNL. Above 55 DNL, land uses require closer attention. The Standards indicate that noise above 65 DNL impacts residences, meaning that homes should either not be permitted or should be specially designed in such areas.

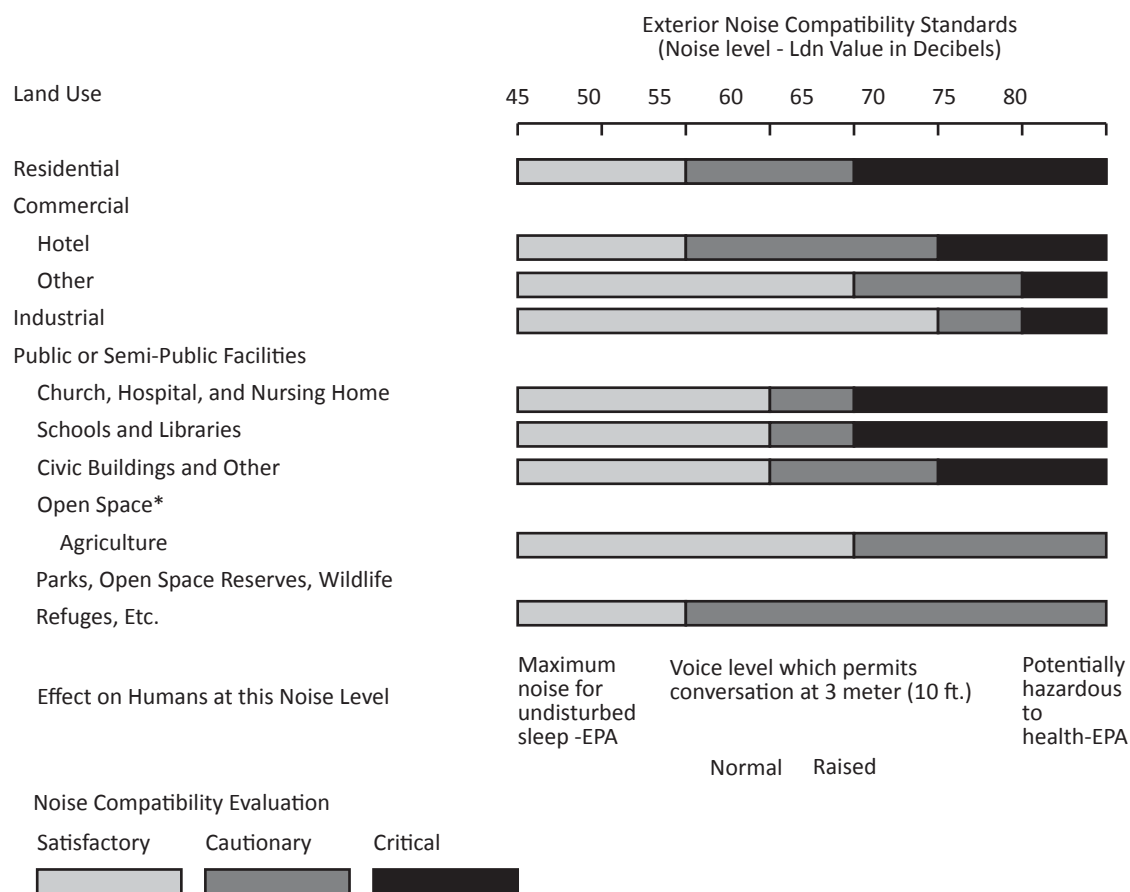
In order to use the Standards, it is necessary to define the areas of the county which are affected by noise levels of 55 DNL or higher. Within urban service areas, noise levels have been inventoried in the noise elements of the cities' general plans and the County recognizes this city data for decisions regarding all lands within urban services, incorporated and unincorporated. Within urban service areas, lands shall be considered to be impacted by noises which are within 1,000 feet of a freeway or expressway, land within the 65 CNEL area of an airport, and land near roadways where city comments on projects indicate a noise impact to exist.

ALUC PLAN AND LAND USE REGULATIONS

Ensuring compatibility between aircraft noise and various types of land uses is one of the primary functions of the Airport Land Use Commission (ALUC). The ALUC's Land Use Plan for Areas Surrounding Santa Clara County Airports (ALUC Plan) includes a detailed discussion of the types of noise generated by aircraft, how the noise environment around airports is measured, how noise compatibility standards were established, and the steps being taken to control airport noise.



Noise Compatibility Standards for Land Use in Santa Clara County



* For open space use, there are no critical noise levels listed. Homes in agricultural areas are not subject to the "Residential" standards. Public buildings in parks and open space areas shall meet noise standards as listed under "Public of Semi-Public facilities. " For open space use, the maximum level of noise which a new land use may impose on neighboring open space shall be the upper limit of the "Satisfactory Noise Level."

Several types of noise are common in the vicinity of airports. Noise generated during take-off and landing operations is most commonly the focus of neighborhood concerns, but other types of aircraft-generated noise can be a problem. Planes in flight, engine "run-up", the low frequency "rumble" of jet aircraft, or helicopter noise can be intrusive to some individuals.

The Community Noise Equivalent Level (CNEL) contours have been mapped and are used to evaluate the compatibility of various types of land uses within the noise environment surrounding the airport. These contours are also

called noise zones and illustrate the reduction in acoustical energy which can be expected to occur as sound travels away from the airport.

There are however, limitations to using just the CNEL values in this case. CNEL measures noise over a 24 hour period, placing a 5 dB penalty on noises occurring from 7:00 p.m. to 10:00 p.m. and a 10 dB penalty on all noises occurring from 10:00 p.m. to 7:00 a.m. Single events may be 40 or 50 dB higher than the overall average of sounds in a given area and therefore constitute a nuisance even though the CNEL is acceptable.



The majority of complaints originating from outside of the designated noise impact areas surrounding our airports are related to single events, rather than the overall operation of the airport. Similarly, people living further from the airport than those within the 60-65 CNEL contour may hear a lower level of sound from aircraft operations, but be more irritated by it because the sound lasts longer at their location. Weather conditions can also change where sound travels.

For this reason, Single Event Noise Exposure Levels (SENEL) may also be calculated for airports such as San Jose International Airport. The combination of the average noise environment as shown by the CNEL and the single event levels gives a better understanding of the noise environment that will be encountered by a proposed land use and, thus, provides a better basis for decision making.

SOURCES OF AIRPORT NOISE

There are five airports in Santa Clara County. Three are designed for general aviation uses (Palo Alto, Reid-Hillview, and South County), one is an international airport (San Jose), and one is a Federal Airport, with a military tenant (Moffett Field).

Santa Clara County manages and operates three general aviation airports. Palo Alto Airport occupies 102 acres near San Francisco Bay in the northwestern part of the county. The airport is classified by the FAA as a Basic Utility II (B1) airport, meaning that it can service about 75% of the single-engine and small twin-engine airplanes used for personal and business purposes. A Basic Utility II airport can also serve some small business and air taxi-type twin-engine airplanes.

Recommended Maximum Interior Noise Levels For Intermittent Noise

	Use	dBA
Residential		45
Commercial		
	Hotel-Motel	45
	Executive Offices, Conference Rooms	55
	Staff Offices	60
	Restaurant, Markets, Retail Stores	60
	Sales, Secretarial	65
	Sports Arena, Bowling Alley, etc.	75
Industrial		
	Offices (same as above)	55-60
	Laboratory	60
	Machine shop, Assembly and others	75
	Mineral Extraction	75
Public or Semi-Public Facility		
	Concert Hall & Legitimate Theater	30
	Auditorium, Movie Theater & Church	45
	Hospital, Nursing Home & Firehouse (sleeping quarters)	45
	School Classroom	50
	Library	50
	Other Public Buildings	55



Reid-Hillview Airport, located on the east side of the City of San Jose, is near the center of the County. It too, is classed as a Basic Utility II (B1) facility and occupies 179 acres.

The San Martin Airport is in San Martin, an unincorporated area between the cities of Gilroy and Morgan Hill. San Martin Airport is also a Basic Utility II (B1) airports and occupies 179 acres.

In addition to airports, heliports contribute to ambient noise levels in many areas of the county. Heliports may be operated for private businesses and individuals, and emergency uses.

Noise at heliports is primarily produced by helicopters on takeoff or landing, in over flights, and in warm-up or cool-down procedures. Noise levels produced by individual helicopter operations may be predicted using the Federal Aviation Administration's "Helicopter Noise Exposure Curves for Use in Environmental Impact Assessment" (Report No. FAA-EE-82-16), or by computer models developed by the FAA for airports (e.g., the Integrated Noise Model, or INM) and for heliports (e.g., the Heliport Noise Model, or HNM).

The noise levels associated with operations at a given heliport will depend upon flight tracks, the helicopter types used, the number of operations, and the time of day during which operations occur. Each of these aspects of heliport operation must be defined to assess the potential noise impacts upon noise-sensitive land uses.

Strategies, Policies, and Implementation

Santa Clara County and the cities should strive to ensure an environment for all residents that is free from noise that jeopardizes their health and well-being. The County and most cities already have noise ordinances in place. Many also have regulations dealing with noise from sources not subject to land use permits (i.e., barking dogs, electronic amplifiers, etc.) All of these ordinances should be enforced to the greatest extent feasible.

The State has researched the impacts of differing noise levels on a variety of land uses, as have the Federal government and local jurisdictions. Based on those studies, certain maximum standards for interior living spaces have been incorporated into State law. Standards for multifamily units are also incorporated into the Uniform Building Code (UBC). The UBC standards have been adopted by the County and all the cities.



Strategy#1: Prevent of Minimize Noise Conflicts

The ideal is a complete separation of noise sensitive uses from noise generating sources. Given that all types of land uses must coexist within the county's urban areas, the planning challenge is in achieving adequate noise compatibility. Land use planning and development review must carefully evaluate the noise producing potential of new development. Where that potential exceeds acceptable limits, steps must be taken to minimize impacts on both existing and projected surrounding uses.



Policies and Implementation

C-HS 24

Environments for all residents of Santa Clara County free from noises that jeopardize their health and well-being should be provided through measures which promote noise and land use compatibility.

C-HS 25

Noise impacts from public and private projects should be mitigated.

Implementation Recommendations

C-HS(i) 23

Project design review should assess noise impacts on surrounding land uses.
(Implementors: County and cities)



C-HS(i) 24

Where necessary, construct sound walls or other noise mitigations.

(Implementors: County, cities, and public agencies.)

C-HS(i) 25

Prohibit construction in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented.

(Implementors: County and cities)

C-HS(i) 26

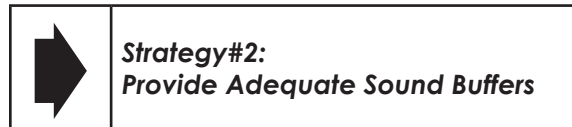
Require project-specific noise studies to assess actual and protected dB noise contours for proposed land uses likely to generate significant noise.

(Implementors: County and cities)

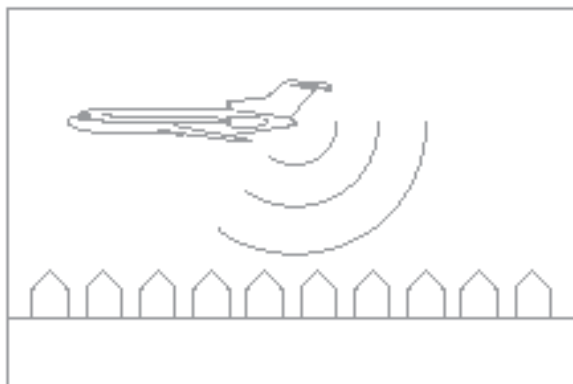
C-HS(i) 27

Take noise compatibility impacts into account in developing local land use plans.

(Implementors: County and cities)



Another approach to noise compatibility is providing noise buffers between noise sources and new projects. There are many noise reduction techniques which can be built into new development. This approach is most effective in large scale, mixed use or planned developments. Such techniques include locating noise sensitive buildings away from noise sources and using the natural topography and intervening buildings to shield noise sensitive uses. There are a



number of techniques to minimize interior noise, including site planning, architectural design and construction standards, and noise barriers.

Within areas identified as being impacted by noise, it will be necessary to design projects to be compatible with the specific types of noise on the site. The best basis for this design is to plan to make the project compatible with the loudest individual noise sources that might affect the site. In the case of airports, such noise is the loudest aircraft that normally uses the airport. (The ALUC Plan has defined this sound level for each airport.) In the case of roads, the level under state law is the maximum noise set for trucks.



C-HS 26

New development in areas of noise impact (areas subject to sound levels of 55 DNL or greater) should be approved, denied, or conditioned so as to achieve a satisfactory noise level for those who will use or occupy the facility (as defined in "Noise Compatibility Standards for Land Use" and "Maximum Interior Noise Levels For Intermittent Noise").

Implementation Recommendations

C-HS(i) 28

Incorporate acoustic site planning into the design of new development, particularly large scale, mixed use, or master planned development, through measures which may include: a. separation of noise sensitive buildings from noise generating sources; b. use of natural topography and intervening structure to shield noise sensitive land uses; and c. adequate sound proofing within the receiving structure.

(Implementors: County, cities, architects and developers)



Strategy#3: Minimize Exposure to Airport Noise

With regard to airports, the ALUC is charged with providing guidance to local jurisdictions to insure that land uses established in the vicinity of airports are compatible with the noise environment. The primary vehicle for this guidance is the ALUC Plan. In determining appropriate uses for areas adjacent to county airports, ALUC has given serious consideration to noise, particularly noise which might interfere with speech or sleep, and those noises which might lead to excessive stress.

State law mandates that each community's general plan be consistent with local ALUC Plans. The most effective way to ensure consistency is to defer to ALUC policies and standards for development on or adjacent to airports.



Policies and Implementation

C-HS 27

Land uses approved by the County and the cities shall be consistent with the adopted policies of the Santa Clara County Airport Land Use Commission Comprehensive Land Use Plans for specific airports.

Implementation Recommendations

C-HS(i) 29

Adhere to the adopted policies and standards in the Santa Clara County Airport Land Use Commission Comprehensive Land Use Plans for specific airports, when making decisions regarding land use adjacent to airports.
(Implementors: County and cities)

Natural Hazards

Summary

Santa Clara County is subject to a number of significant natural hazards, including geologic and seismic hazards, extreme fire hazards, and flood hazards. To varying extents, the urban and rural environments are both impacted by the risks imposed by such phenomena. Amidst the challenges of increasing population and economic development, the primary objective of local governments where natural hazards are concerned is the protection of public safety and general welfare through the following major strategy and policy directions:

- Strategy #1: Inventory Hazards and Monitor Changing Conditions
- Strategy #2: Minimize the Resident Population Within High Hazard Areas
- Strategy #3: Design, Locate and Regulate Development to avoid or Withstand Hazards
- Strategy #4: Reduce the Magnitude of the Hazard, If Feasible
- Strategy #5: Provide Public Information Regarding Natural Hazards

Background

NATURAL HAZARDS AND THE ROLE OF LOCAL GOVERNMENTS

■ Types of Public Safety Issues Addressed in General Plans

Protection of public safety is one of the principal, if not foremost, responsibilities of local government. The major types of natural hazards addressed in this section of the Countywide Health & Safety chapter include those which affect physical growth and development:



Noise

Summary

All citizens are entitled to a peaceful and quiet environment, free from unnecessary and annoying levels of noise. Noise has been shown to interfere with speech, sleep and mental concentration, induce stress and headaches, and disrupt overall efficiency and enjoyment of life. It is, therefore, in the public interest that the County and the cities evaluate techniques and develop policies which provide for an environment free from noise which may be hazardous to public health and well-being.

Santa Clara County strives to ensure an environment for all residents that is free from noise that jeopardizes public health and well-being. Toward that end, the strategies in this section focus on two principal areas:

- Minimizing Noise Conflicts, and
- Minimizing Exposure to Airport Noise

Background

Noise is unwanted sound. The impacts of noise can be annoying and physically harmful. Exposure to intense noise may lead to irreversible hearing damage, and may induce other health problems due to stress. The effects of noise build up over time, so it is necessary to deal not only with the level of sound but also the duration of exposure.

COEXISTING WITH NOISE

Where noise sources are a given, the ideal situation would be complete separation of noise-sensitive uses from noise-generating sources. However, real world conditions make it difficult to isolate all noise sources. Consequently, all new uses are evaluated for potential noise impacts on existing uses and for their sensitivity

to existing noise sources which may already be affecting the site. The new use generally bears the burden of ensuring that it is compatible with existing uses.

■ Measures to Mitigate Noise Impacts

Where the potential for significant noise impacts exists, buffers can be placed between noise sources and existing or proposed development. This approach is most effective in large scale, mixed use or planned developments. Such techniques include locating noise sensitive buildings away from noise sources and using the natural topography or intervening buildings to shield noise sensitive uses. There are also a number of techniques to minimize interior noise, including site planning, architectural design and construction standards, and noise barriers.

Within areas identified as being impacted by noise, projects should be designed to be compatible with the specific types of noise which affect the site the most. In the case of airports, such noise is the loudest aircraft that normally uses the airport. In the case of roads, the maximum noise levels are those of large trucks traveling at the speed limit.

■ Noise Impacts at the Urban Fringe

The techniques described above can mitigate noise impacts only so far. Some noise impacts are more difficult to mitigate than others. A growing source of noise-based conflicts in rural unincorporated areas is the mix of essentially suburban residential development with active agriculture. Many new rural area homeowners, particularly recent urban transplants, appear to be surprised by the sights, smells and sounds which have always been apparent to farm families. Although initially attracted to the area by what they perceived to be a "farm" lifestyle, they have shown a degree of intolerance for the noise and dust generated by heavy farm equipment and the extreme hours crop maintenance demands. Their discomfort has led to a rise in citizen complaints and citations of farmers and machine operators.



Most of these incidents have occurred at the fringe of the urban area as development expands into what are active farming areas. Although County land use policies generally discourage non-farm related housing in agricultural areas, some housing for urban workers has occurred there. For many reasons, friction between new and existing land uses at the urban fringe may be largely unavoidable.

■ Noises Appropriate to the Rural Area

Some types of noises are common and appropriate to the rural area. Noise producing land uses such as farming activities, quarrying operations, and a range of transportation types are typical of rural agricultural areas. New uses carry the burden of proving they are compatible with existing uses and with long term projected uses in the area. The County should carefully assess the compatibility of non-farm-related uses before allowing such uses to expand into active farming areas.

■ Reducing Noise Conflicts

A variety of options do exist for reducing friction between farm and non-farm uses. Principal among these would be to inform prospective buyers that they are purchasing property adjoining or near to active farm operations and that this necessarily places them within range of the noise of tractors and other vehicles on or traveling to and from the fields. Farmers, too, must strive to be good neighbors by keeping noise to a minimum. Community contacts which will bring these two groups together will enhance mutual understanding and the opportunity to develop more effective and more feasible solutions to noise abatement. If not, dispute resolution services should be made available as a less costly alternative to litigation.

Measuring Noise

Three common measures of sound form the basis of County standards discussed in this section: Day-Night Average Sound Level (DNL), Community Noise Equivalent Level (CNEL), and A-weighted Sound Level (dB).

The level of sound that impacts a property varies greatly during the day. As an example, the sound near an airport may be relatively quiet when no airplane is taking off or landing, but will be extremely loud as a plane takes off. In order to deal with these variations, several noise indices have been developed which measure how loud each sound is, how long it lasts, and how often the sound occurs. The indices express all the sound occurring during the day as a single average level, which if it occurred all day would convey the same sound energy to the site.

The sound indices most commonly used to describe environmental noise are the Day-Night Average Sound Level (DNL) and the Community Noise Equivalent Level (CNEL). When calculating the 24-hour average of sound in an area, these two indices respond to the community's preference for a quieter environment in the evening and nighttime

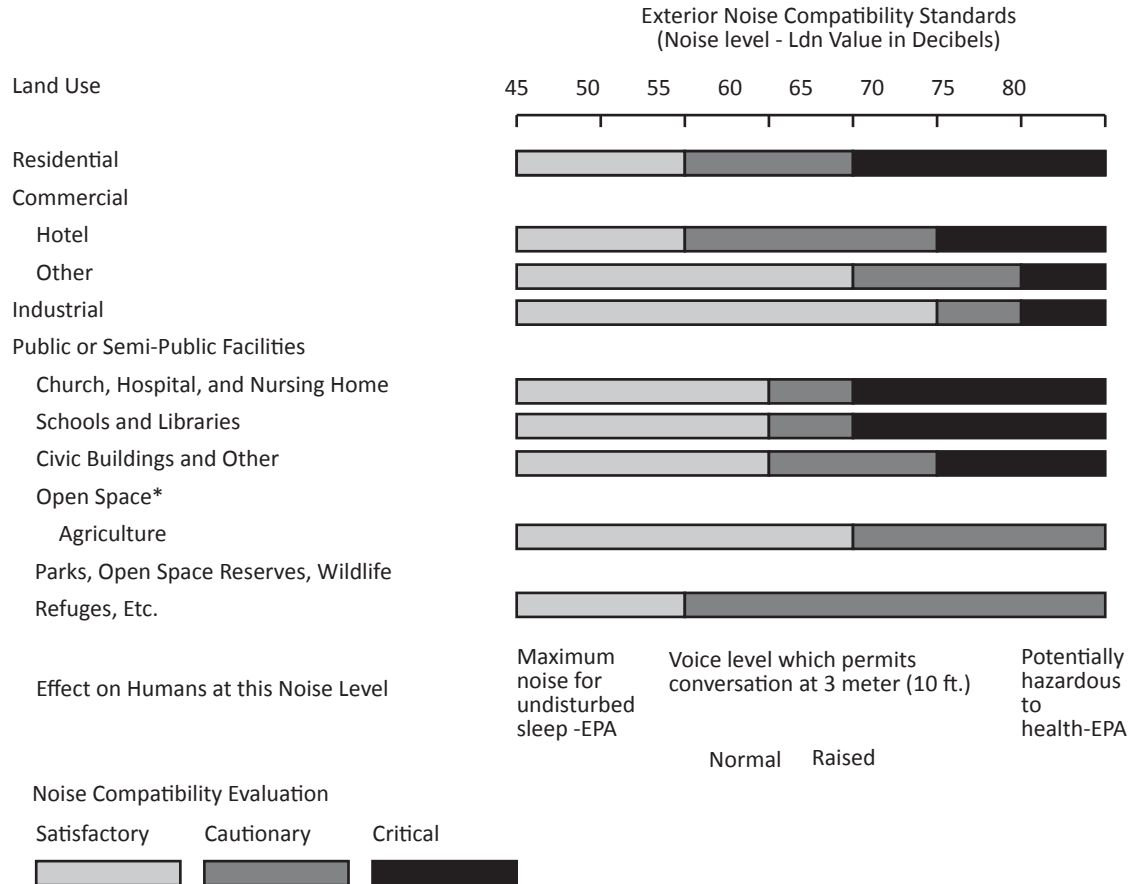
hours by assigning penalties to noises which occur during those specified hours prior to calculating the average. Both indices place a 10 dB penalty on all noises occurring from 10:00 p.m. to 7:00 a.m. The CNEL calculation varies in that it also places a 5 dB penalty on noise events during evening hours (7:00 p.m. to 10:00 p.m.). The two systems yield generally similar results and are used interchangeably.

In this General Plan, noise standards are expressed as DNL levels, as recommended by the Environmental Protection Agency (EPA) for community noise planning. Santa Clara County's Airport Land Use Commission expresses its standards in terms of CNEL values, as is commonly practiced in California.

Sound is measured in decibels (dB) using a special meter. The decibel scale of sound is logarithmic. Each increase of 10 dB means that the acoustical energy is multiplied by 10 - a sound of 70 dB is 10 times as intensive as one of 60 dB. However, the relative loudness of sound as perceived by the human ear does not closely match the actual relative amounts of sound energy. For example, while 70 dB is physically 10 times as intensive as 60 dB, listeners tend to judge it as only twice as loud.



Noise Compatibility Standards for Land Use in Santa Clara County



* For open space use, there are no critical noise levels listed. Homes in agricultural areas are not subject to the "Residential" standards. Public buildings in parks and open space areas shall meet noise standards as listed under "Public of Semi-Public facilities. " For open space use, the maximum level of noise which a new land use may impose on neighboring open space shall be the upper limit of the "Satisfactory Noise Level."

MAJOR NOISE SOURCES

Noise sources are divided into two categories: stationary sources and mobile sources. Stationary sources emanate from a single point. Mobile sources are those that move around or can't be attributed to a single point (i.e. a plane in flight). As one moves away from a sound source, the sound level gradually decreases or attenuates. Aside from distance, a sound may be attenuated by objects which shield a potential receiver from unwanted sound.

In 1974, the County conducted a survey to determine the areas most impacted by noise. The study found that the major areas affected by noise are those located near transportation—streets, freeways, rail lines, and airports. The County has previously identified areas experiencing noise levels of 55 dB DNL or greater as "noise impact areas". Noise impact areas exist in connection with all of the identified sources.

In general, the lands not affected by transportation had readings in the 40 to 55 DNL range, with remote parks having readings in the very low range below 40 DNL. In rural areas, general



noise levels are low but specific noises are often extremely annoying (i.e., blasting from quarries, shooting ranges, power boats, and off-road vehicles may disturb the serenity of an area without significantly affecting the day-long average readings of the DNL scale.)

Noises generated by transportation are by far the most significant and persistent countywide. The affected areas along freeways and near airports have been mapped by the State of California, by the County Transportation Agency, and by the Airport Land Use Commission (ALUC). In addition, the County noise survey indicated a pattern of noise impact along several county highways. (Updated noise contour maps for areas along major transportation corridors are available for review in the County Planning Office).

AIRPORT NOISE

■ **ALUC Plan and Land Use Regulations**

Ensuring compatibility between aircraft noise and various types of land uses is one of the primary functions of the Airport Land Use Commission (ALUC). The ALUC's Land Use Plan for Areas Surrounding Santa Clara County Airports (ALUC Plan) includes a detailed discussion of the types of noise generated by aircraft, how the noise environment around airports is measured, how noise compatibility standards were established, and the steps being taken to control airport noise.

Several types of noise are common in the vicinity of airports. Noise generated during take-off and landing operations is most commonly the focus of neighborhood concerns, but other types of aircraft-generated noise can be a problem. Planes in flight, engine "run-up", the low frequency "rumble" of jet aircraft, or helicopter noise can be intrusive to some individuals.

The Community Noise Equivalent Level (CNEL) contours have been mapped and are used to evaluate the compatibility of various types of land uses within the noise environment surrounding the airport. These contours are also called noise zones and illustrate the reduction

in acoustical energy which can be expected to occur as sound travels away from the airport.

There are however, limitations to using just the CNEL values in this case. CNEL measures noise over a 24 hour period, placing a 5 dB penalty on noises occurring from 7:00 p.m. to 10:00 p.m. and a 10 dB penalty on all noises occurring from 10:00 p.m. to 7:00 a.m. Single events may be 40 or 50 dB higher than the overall average of sounds in a given area and therefore constitute a nuisance even though the CNEL is acceptable.

The majority of complaints originating from outside of the designated noise impact areas surrounding our airports are related to single events, rather than the overall operation of the airport. Similarly, people living further from the airport than those within the 60-65 CNEL contour may hear a lower level of sound from aircraft operations, but be more irritated by it because the sound lasts longer at their location. Weather conditions can also change where sound travels. For this reason, Single Event Noise Exposure Levels (SENEL) may also be calculated for airports such as San Jose International Airport. The combination of the average noise environment as shown by the CNEL and the single event levels gives a better understanding of the noise environment that will be encountered by a proposed land use and, thus, provides a better basis for decision making.

■ **Sources of Airport Noise**

There are five airports in Santa Clara County, one of which is located in the rural unincorporated area. The San Martin Airport, previously named South County Airport, is located in the unincorporated area of San Martin, between the cities of Gilroy and Morgan Hill.

San Martin Airport is a Basic Utility II airport and occupies 179 acres. A Basic Utility II airport means that it can service about 75% of the single-engine and small twin-engine airplanes used for personal and business purposes. A Basic Utility II airport can also serve some small business and air taxi-type twin-engine airplanes.



■ Heliport Traffic

In addition to fixed wing aircraft, San Martin Airport is also home to several helicopter training and repair facilities. As a heliport, it is also the site of frequent helicopter training exercises by pilots of the San Jose Police Department.

Heliports may be operated for private businesses and individuals, and emergency uses. Noise at heliports is primarily produced by helicopters on takeoff or landing, in over flights, and in warm-up or cool-down procedures. Noise levels produced by individual helicopter operations may be predicted using the Federal Aviation Administration's "Helicopter Noise

Exposure Curves for Use in Environmental Impact Assessment" (Report No. FAA-EE-82-16), or by computer models developed by the FAA for airports (e.g., the Integrated Noise Model, or INM) and for heliports (e.g., the Heliport Noise Model, or HNM).

The noise levels associated with operations at a given heliport will depend upon flight tracks, the helicopter types used, the number of operations, and the time of day during which operations occur. Each of these aspects of heliport operation must be defined to assess the potential noise impacts upon noise-sensitive land uses.

Recommended Maximum Interior Noise Levels For Intermittent Noise

Use		dBA
Residential		45
Commercial		
	Hotel-Motel	45
	Executive Offices, Conference Rooms	55
	Staff Offices	60
	Restaurant, Markets, Retail Stores	60
	Sales, Secretarial	65
	Sports Arena, Bowling Alley, etc.	75
Industrial		
	Offices (same as above)	55-60
	Laboratory	60
	Machine shop, Assembly and others	75
	Mineral Extraction	75
Public or Semi-Public Facility		
	Concert Hall & Legitimate Theater	30
	Auditorium, Movie Theater & Church	45
	Hospital, Nursing Home & Firehouse (sleeping quarters)	45
	School Classroom	50
	Library	50
	Other Public Buildings	55



Strategies, Policies, and Implementation

The strategies below affirm the County's intent to continue its efforts to ensure an environment for all unincorporated area residents that is free from unwanted noise which jeopardizes their health and well-being.

The State has researched the impacts of differing noise levels on a variety of land uses, as have the Federal government and local jurisdictions. Based on those studies, noise standards for interior living spaces have been incorporated into a County Noise Ordinance. Standards for multifamily units are also incorporated into both State Law -Title 24 and the Uniform Building Code (UBC). The UBC standards have been adopted by the County.



Strategy#1: Minimize Noise Conflict

Given that many types of land uses must coexist in the unincorporated county, the challenge for planning is to achieve maximum compatibility. Land use planning and development review must carefully evaluate the noise producing potential of new development. Where that potential exceeds acceptable limits, steps must be taken to minimize impacts on both existing and projected surrounding uses.

Parts of the rural Santa Clara County are developed, although at very low density. Many rural residents have chosen to live in these areas precisely for the quiet character. New uses proposed for such areas need to be carefully assessed for the noise inducing potential. Adequate distancing alone can often mitigate most noise impacts which would otherwise be intolerable in more densely developed areas. However, further measures may be necessary to ensure that the quality of life for residents is not unduly degraded.

Conversely, the noise of tractors and other farm machines are common in rural agricultural areas. In the interests of sustaining long term agriculture, a major economic as well as a land use objective for the County, it is important that noise-sensitive, non-agricultural uses be kept away from farming areas or that noise buffering measures be integrated into those non-agricultural projects.



Policies and Implementation

R-HS 1

Significant noise impacts from either public or private projects should be mitigated.

R-HS 2

The County should seek opportunities to minimize noise conflicts in the rural areas.

R-HS 3

New development in areas of noise impact (areas subject to sound levels of 55 DNL or greater) should be approved, denied, or conditioned so as to achieve a satisfactory noise level for those who will use or occupy the facility (as defined in "Noise Compatibility Standards for Land Use" and "Maximum Interior Noise Levels For Intermittent Noise").

Implementation Recommendations

R-HS(i) 1

Project design review should assess noise impacts on surrounding land uses. (Implementor: County)

R-HS(i) 2

Where necessary, require appropriate noise mitigations. (Implementor: County)

R-HS(i) 3

Prohibit construction in areas which exceed applicable interior and exterior standards, unless suitable mitigation measures can be implemented. (Implementors: County)



R-HS(i) 4

Require project-specific noise studies to assess actual and projected dB noise contours for proposed land uses likely to generate significant noise. (Implementors: County)

R-HS(i) 5

Take noise compatibility impacts into account in developing local land use plans. (Implementors: County)

R-HS(i) 6

Incorporate acoustic site planning into the design of new development, particularly large scale, mixed use, or master planned development, through measures which may include:

- a. separating noise sensitive buildings from noise generating sources;
- b. using natural topography and intervening structure to shield noise sensitive land uses; and
- c. adequate sound reduction within the receiving structure.

(Implementors: County, architects and developers)

R-HS(i) 7

Support continued contacts (i.e., a task force, public education, speaking opportunities) between farming and non-farming interests toward enhancing the compatibility of rural area uses.

(Implementors: County, Farm Bureau, farming interests, community and real estate industry representatives)



**Strategy#2:
Minimize Exposure to Airport Noise**

With regard to airports, the Airport Land Use Commission (ALUC) is charged with providing guidance to local jurisdictions to insure that land uses established in the vicinity of airports are compatible with the noise environment. The primary vehicle for this guidance is the ALUC Plan. In determining appropriate uses for areas adjacent to county airports, ALUC has given serious consideration to noise, particularly noise which might interfere with speech or sleep, and those noises which might lead to excessive stress.

State law mandates that the County's general plan be consistent with local ALUC Plans. The most effective way to ensure consistency is to defer to ALUC policies and standards for development on or adjacent to airports in the rural unincorporated area.



Policies and Implementation

R-HS 4

Land uses approved by the County and the cities shall be consistent with the adopted policies of the Santa Clara County Airport Land Use Commission's Comprehensive Land Use Plan.

Implementation Recommendations

R-HS(i) 8

Adhere to the adopted policies and standards in the Santa Clara County Airport Land Use Commission's Comprehensive Land Use Plan when making decisions regarding land use adjacent to airports.

Santa Clara County Code, Title B

Division B11, CHAPTER VIII. - CONTROL OF NOISE AND VIBRATION

Sec. B11-150. - Declaration of findings, intent and policy.

It is determined that certain noise levels and vibrations are detrimental to the public health, welfare and safety, and are contrary to public interest.

It is the intent of this chapter to control unnecessary, excessive and annoying noise and vibration and to prohibit the noise and vibration generated from or by all sources as specified in this chapter. It is also the intent of the County to maintain quiet in those areas that exhibit low noise levels and to implement programs aimed at reducing noise in those areas where noise levels are above acceptable values. Therefore, the Board of Supervisors does ordain and declare that creating, maintaining, causing or allowing to be created, caused or maintained any noise or vibration in a manner prohibited by or not in conformity with the provisions of this chapter is hereby declared a nuisance.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-151. - Definitions.

In addition to the definitions in Chapter I, the following terms are defined for purposes of this chapter:

- (a) Terminology means all terminology used in this chapter, not defined below, must be in conformance with applicable publications of the American National Standards Institute (ANSI) or its successor body.
- (b) A-weighted sound level means the sound pressure level in decibels as measured on a sound level meter using the A-weighted network. The level so read is designated dB(A) or dBA.
- (c) Agricultural property means a parcel of real property located in areas zoned exclusively for agricultural purposes.
- (d) Ambient noise level means the composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.
- (e) Commercial area means an area zoned for commercial uses.
- (f) Construction means any site preparation, assembly, erection, substantial repair, alteration, or similar action for or of public or private rights-of-way, structures, utilities, or similar property.
- (g) Cumulative period means an additional period of time composed of individual time segments that may be continuous or interrupted.
- (h) Decibel means a unit for measuring the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure of 20 micropascals.
- (i) Demolition means any dismantling, intentional destruction or removal of structures, utilities, public or private rights-of-way; surfaces, or similar property.
- (j) Emergency means any occurrence or set of circumstances involving actual or imminent physical trauma or property damage that demands immediate action.
- (k) Emergency work means any work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened or caused by an emergency.

- (l) Stationary noise source means a stationary device that creates sounds while fixed or motionless, including but not limited to, residential, agricultural, industrial and commercial machinery and equipment, pumps, fans, compressors, air conditioners and refrigeration equipment.
- (m) Impulsive sound means sound of short duration, usually less than one second, with an abrupt onset and rapid decay. Examples of sources of impulsive sound include explosions, drop forge impacts and the discharge of firearms.
- (n) Industrial area means an area zoned for light or heavy industrial uses.
- (o) Intrusive noise means that noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency and time of occurrence, and tonal or informational content as well as the prevailing ambient noise level.
- (p) Mobile noise source means any noise source other than a stationary noise source.
- (q) Motor vehicle means any and all self-propelled vehicles as defined in the California Motor Vehicle Code, including all on-highway type motor vehicles subject to registration under the code, and all off-highway type motor vehicles subject to identification under the code.
- (r) Motorboat means any vessel propelled by machinery, whether or not the machinery is the principal source of propulsion, but will not include a vessel that has a valid marine document issued by the United States Bureau of Customs or any federal agency successor thereto [Harbors and Navigation Code § 651(n)].
- (s) Muffler or sound dissipative device means a device consisting of a series of chambers or baffle plates, or other mechanical design, for the purpose of receiving exhaust gas, compressed air, or other gas flow, and effective in reducing noise.
- (t) Multiple-family dwelling residential means any real property with dwellings of three or more units in any zoning district where the dwellings are a permitted use.
- (u) Noise means any sound that annoys or disturbs human beings or that causes or tends to cause an adverse psychological or physiological effect on human beings.
- (v) Noise disturbance means any sound which:
 - (1) Endangers or injures the safety or health of human beings or animals; or
 - (2) Annoys or disturbs a reasonable person of normal sensitivities; or
 - (3) Endangers or injures personal or real property.
- (w) One- and two-family residential means any real property in any zoning district where one- or two-family dwellings are a permitted use.
- (x) Powered model vehicle means any self-propelled, airborne, waterborne or landborne plane, vessel or vehicle, which is not designed to carry persons, including but not limited to any model airplane, boat, car or rocket.
- (y) Public space means any real property or structures that are owned or controlled by a governmental entity.
- (z) Pure tone means any sound that can be distinctly heard as a single pitch or a set of single pitches. For the purposes of this chapter, a pure tone will exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the two contiguous one-third octave bands by five dB for center frequencies of 500 Hz and above and by eight dB for center frequencies between 160 and 400 Hz and by 15 dB for center frequencies less than or equal to 125 Hz.
- (aa) Sound-amplifying equipment means any device for the amplification of the human voice, music, or any other sound. This excludes standard automobile radios when used and heard only by the

occupants of the vehicle in which the radio is installed, and warning devices on authorized emergency vehicles or horns or other warning devices on any vehicle used only for traffic safety purposes.

- (bb) Sound level meter means an instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement of sound levels, which at least satisfies the requirements pertinent for Type S2A meters in American National Standards Institute specifications for sound level meters, S1.4-1971, or the most recent revision thereof.
- (cc) Sound truck means any motor vehicle, or any other vehicle regardless of motive power, whether in motion or stationary, having mounted thereon or attached thereto any sound-amplifying equipment.
- (dd) Vibration perception threshold means the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by direct means as, but not limited to, sensation by touch or visual observation of moving objects. The perception threshold will be presumed to be a motion velocity of 1/100 inches per second over the range of one to 100 Hz.
- (ee) Weekday means any day, Monday through Friday, which is not a national legal holiday.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-152. - Exterior noise limits.

- (a) Maximum permissible sound levels by receiving land use.
 - (1) The noise standards for the various receiving land use categories as presented in Table B11-152 will apply to all property within any zoning district.
 - (2) No person may operate or cause to be operated any source of sound at any location within the unincorporated territory of the County or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by the person, which causes the noise level when measured on any other property either incorporated or unincorporated, to exceed:
 - a. The noise standard for that land use as specified in Table B11-152 for a cumulative period of more than 30 minutes in any hour; or
 - b. The noise standard plus five dB for a cumulative period of more than 15 minutes in any hour; or
 - c. The noise standard plus ten dB for a cumulative period of more than five minutes in any hour; or
 - d. The noise standard plus 15 dB for a cumulative period of more than one minute in any hour; or
 - e. The noise standard plus 20 dB or the maximum measured ambient, for any period of time.
 - (3) If the measured ambient level exceeds that permissible within any of the first four noise limit categories above, the allowable noise exposure standard will be increased in five dB increments in each category as appropriate to encompass or reflect the ambient noise level. In the event the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under the category will be increased to reflect the maximum ambient noise level.
 - (4) If the noise measurement occurs on a property adjoining a different land use category, the noise level limit applicable to the lower land use category, plus five dB, will apply.
 - (5) If for any reason the alleged offending noise source cannot be shutdown, the ambient noise must be estimated by performing a measurement in the same general area of the source but at a sufficient distance that the noise from the source is at least ten dB below the ambient in order

that only the ambient level be measured. If the difference between the ambient and the noise source is five to ten dB, then the level of the ambient itself can be reasonably determined by subtracting a one-decibel correction to account for the contribution of the source.

- (b) Correction for character of sound. In the event the alleged offensive noise contains a steady, audible tone such as a whine, screech or hum, or contains music or speech conveying informational content, the standard limits set forth in Table B11-152 will be reduced by five dB.

TABLE B11-152
Exterior Noise Limits
(Levels not to be exceeded more than 30 minutes in any hour)

Receiving Land Use Category	Time Period	Noise Level (dBA)
One- and Two-Family Residential	10:00 p.m.—7:00 a.m.	45
	7:00 a.m.—10:00 p.m.	55
Multiple-Family Dwelling	10:00 p.m.—7:00 a.m.	50
Residential Public Space	7:00 a.m.—10:00 p.m.	55
Commercial	10:00 p.m.—7:00 a.m.	60
	7:00 a.m.—10:00 p.m.	65
Light Industrial	Any Time	70
Heavy Industrial	Any Time	75

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-153. - Interior noise standards.

- (a) Maximum permissible dwelling interior sound levels:
- (1) The interior noise standards for multifamily residential dwellings as presented in Table B11-153 will apply, unless otherwise specifically indicated, within all dwellings.

TABLE B11-153

Type of Land Use	Time Interval	Allowable Interior Noise Level (dBA)
Multifamily dwelling	10:00 p.m.—7:00 a.m.	35
	7:00 a.m.—10:00 p.m.	45

- (2) No person will operate or cause to be operated within a dwelling unit any source of sound or allow creation of any noise which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed:
 - a. The noise standard as specified in Table B11-153 for a cumulative period of more than five minutes in any hour; or
 - b. The noise standard plus five dB for a cumulative period of more than one minute in any hour; or
 - c. The noise standard plus ten dB or the maximum measured ambient, for any period of time.
- (3) If the measured ambient level exceeds that permissible within any of the noise limit categories above, the allowable noise exposure standard will be increased in five-dB increments in each category as appropriate to reflect the ambient noise level.
- (b) Correction for character of sound. In the event the alleged offensive noise contains a steady, audible tone such as a whine, screech or hum, or contains music or speech conveying information content, the standard limits set forth in Table B11-153 will be reduced by five dB.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-154. - Prohibited acts.

- (a) Noise disturbances prohibited. No person may willfully or negligently make, continue or cause to be made or continued any sound which:
 - (1) Endangers or injures the safety or health of human beings or animals; or
 - (2) Annoys or disturbs a person of normal sensitivities; or
 - (3) Endangers or injures personal or real properties.
- (b) Specific prohibitions. The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:
 - (1) Radios, television sets, musical instruments and similar devices. Operating, playing or permitting the operation or playing of any radio, television set, phonograph, drum, musical instrument, or similar device which produces or reproduces sound:
 - a. Between the hours of 10:00 p.m. and 7:00 a.m. the following day in a manner as to create a noise disturbance across a residential or commercial real property line or at any time to

violate the provisions of Section B11-152 or B11-153 except for activities for which a variance has been issued.

- b. In the manner as to exceed the levels set forth for public space in Table B11-152, measured at a distance of at least 50 feet (15 meters) from the device operating on a public right-of-way or public space.

(2) Loudspeakers (amplified sound).

- a. Using or operating for any commercial purposes any loudspeaker system or similar device between the hours of 10:00 p.m. and 7:00 a.m. the following day, that the sound there from creates a noise disturbance across a residential real property line, or at any time violates the provisions of Section B11-153.
- b. Using or operating for any noncommercial purposes any loudspeaker, public address system or similar device between the hours of 10:00 p.m. and 7:00 a.m. the following day, that the sound there from creates a noise disturbance across a residential real property boundary or at any time violates the provisions of Section B11-152.

- (3) Street sales. Offering for sale, selling anything, or advertising by shouting, outcry or use of a noise-making device within any residential or commercial area of the County as to cause a noise disturbance. The provisions of this section will not be construed to prohibit the selling by outcry of merchandise, food and beverage at licensed sporting events, parades, fairs, circuses or other similar licensed public entertainment events.

- (4) Animals and birds. Owning, possessing or harboring any animal or bird which howls, barks, meows, squawks or makes other noises continuously and/or incessantly for a period of ten minutes or intermittently for one-half hour or more which creates a noise disturbance across a residential or commercial real property line. For the purpose of this section, the animal or bird noise will not be deemed a disturbance if a person is trespassing or threatening to trespass upon private property in or upon which the animal or bird is situated or for any other legitimate cause which teased or provoked the animal or bird.

- (5) Loading and unloading. Loading, unloading, opening, closing or handling of boxes, crates, containers, building materials, garbage cans or similar objects between the hours of 10:00 p.m. and 7:00 a.m. the following day in a manner as to cause a noise disturbance across a residential real property line or at any time to violate the provisions of Section B11-152.

(6) Construction/demolition.

- a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekdays and Saturday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance. This section will not apply to the use of domestic power tools as specified in Subsection 11.
- b. Where technically and economically feasible, construction activities will be conducted in a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule:

- i. Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment:

	Single- and Two-Family Dwelling Residential Area	Multifamily Dwelling Residential Area	Commercial Area

Daily, except Sundays and legal holidays 7:00 a.m.—7:00 p.m.	75 dBA	80 dBA	85 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

- ii. Stationary equipment. Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of ten days or more) of stationary equipment are as follows:

	Single- and Two-Family Dwelling Residential Area	Multifamily Dwelling Residential Area	Commercial Area
Daily, except Sundays and legal holidays 7:00 a.m.—7:00 p.m.	60 dBA	65 dBA	70 dBA
Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA	60 dBA

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- (7) Vibration. Operating or permitting the operation of any device that creates a vibrating or quivering effect that:
- Endangers or injures the safety or health of human beings or animals; or
 - Annoys or disturbs a person of normal sensitivities; or
 - Endangers or injures personal or real properties.
- (8) Powered model vehicles. Operating or permitting the operation of powered model vehicles:
- Between the hours of 7:00 p.m. and 7:00 a.m. the following day so as to create a noise disturbance across a residential or commercial real property line or at any time to violate the provisions of Section B11-152.
 - In a manner as to exceed the levels set forth for public space land use in Table B11-152, measured at a distance of not less than 100 feet (30 meters) from any point on the path of a vehicle operating on public space or public right-of-way.
- (9) Stationary non-emergency signaling devices. Sounding or permitting the sounding of any electronically amplified signal from any stationary bell, chime, siren, whistle or similar device, intended primarily for non-emergency purposes, from any place, for more than ten seconds in any hourly period.
- (10) Emergency signaling devices.

- a. The intentional sounding or permitting the sounding outdoors of any fire, burglar or civil defense alarm, siren, whistle or similar stationary emergency signaling device, except for emergency purposes or for testing, as provided in Subsection b.
- b. Testing.
 - i. Testing of a stationary emergency signaling device must not occur before 7:00 a.m. or after 7:00 p.m. Any testing will use only the minimum cycle test time. In no case will the test time exceed 60 seconds.
 - ii. Testing of the complete emergency signaling system, including the functioning of the signaling device, and the personnel response to the signaling device, will not occur more than once in each calendar month. The testing will not occur before 7:00 a.m. nor after 10:00 p.m. The time limit specified in Subsection (i) will not apply to the complete system testing.
- c. Sounding or permitting the sounding of any exterior burglar or fire alarm or any motor vehicle burglar alarm unless the alarm is terminated within 15 minutes of activation.

(11) Domestic power tools.

- a. Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, or similar tool between 10:00 p.m. and 7:00 a.m. the following day so as to create a noise disturbance across a residential or commercial real property line.
- b. Any motor, machinery or pump will be sufficiently enclosed or muffled and maintained so as not to create a noise disturbance in accordance with Section B11-152.

(12) Air-conditioning or air-handling equipment. Operating or permitting the operation of any air-conditioning or air-handling equipment in a manner as to exceed any of the following sound levels without a variance:

Measurement Location; dB(A)

Any point on neighboring property line, five feet above grade level, no closer than three feet from any wall 50

Center of neighboring patio, five feet above grade level, no closer than three feet from any wall 45

Outside the neighboring living area window nearest the equipment location, not more than three feet from the window opening, but at least three feet from any other surface 45

(13) Swimming pool motors and equipment. Operating or permitting the operation of any swimming pool motor or swimming pool equipment that the sound therefrom creates a noise disturbance across a residential real property line or at any time violates the provisions of Section B11-152.

(14) Helicopters. Operating or permitting to be operated any helicopter which violates nighttime provisions of Section B11-152 or which causes a noise that exceeds 80 dBA during the day in residential or commercial areas without a variance. Military and government-operated helicopters are exempted from provisions of this section.

(15) Fixed noise source location. Installation or permitting the installation of any fixed noise source in the side yards of any residence without a variance.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-155. - Motor vehicle noise limits.

- (a) Refuse collection vehicles.
 - (1) No person will collect refuse with a refuse collection vehicle between the hours of 6:00 p.m. and 6:00 a.m. the following day in a residential area or adjacent to residential area.
 - (2) No person authorized to engage in waste disposal service or garbage collection will operate any truck-mounted waste or garbage loading and/or compacting equipment or similar device in any manner so as to create any noise exceeding the following levels, measured at a distance of 50 feet from the equipment in an open area:
 - a. Existing equipment purchased or leased on or after a date six months from the effective date of this chapter: 81 dBA.
 - b. New equipment purchased or leased after October 1, 1982: 73 dBA.
 - c. New equipment purchased or leased after July 1, 1984: 70 dBA.
- (b) Vehicle, motorboat or aircraft repair and testing. Repairing, rebuilding, modifying or testing any motor vehicle, motor boat or aircraft in a manner as to create a noise disturbance across a residential real property line, or at any time violate the provisions of Section B11-152.
- (c) Standing motor vehicles. No person will operate or permit the operation of any motor vehicle with a gross vehicle weight rating (GVWR) in excess of 10,000 pounds, or any auxiliary equipment attached to a vehicle, for a period longer than 15 minutes in any hour while the vehicle is stationary, for reasons other than traffic congestion, on a public right-of-way or public space within 150 feet (46 meters) of a residential area between the hours of 10:00 p.m. and 7:00 a.m. the following day.
- (d) Motorized recreational vehicles operating off public right-of-way. No person will operate or cause to be operated any motorized recreational vehicle off a public right-of-way in a manner that the sound levels emitted will violate the provisions of Section B11-152. This section will apply to all motorized recreational vehicles, whether or not duly licensed and registered, including but not limited to commercial or noncommercial racing vehicles, motorcycles, go-carts, amphibious craft, campers, dune buggies and motorboats.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-156. - Special provisions.

- (a) Emergency exceptions. The provisions of this chapter will not apply to:
 - (1) The emission of sound for the purpose of alerting persons to the existence of an emergency; or
 - (2) The emission of sound in the performance of emergency work.
- (b) Warning devices. Warning devices necessary for the protection of public safety, including but not limited to police, fire and ambulance sirens, and train horns, are exempt from the provisions of this chapter.
- (c) Outdoor activities. The provisions of this chapter will not apply to occasional outdoor gatherings, public dances, shows, and sporting and entertainment events, provided the events are conducted pursuant to a permit or license issued by the County relative to the staging of the events.
- (d) Exemption from exterior noise standards. The provisions of Section B11-152 will not apply to activities covered by the following sections:
 - (1) B11-154(3), street sales;
 - (2) B11-154(4), animals and birds;
 - (3) B11-154(6), construction/demolition;
 - (4) B11-154(9), stationary non-emergency signaling devices;

- (5) B11-154(10), emergency signaling devices;
- (6) B11-154(11), domestic power tools;
- (7) B11-154(12), air-conditioning or air-handling equipment;
- (8) B11-155(a), refuse collection vehicles.
- (e) Agricultural operations. The provisions of this chapter will not apply to mechanical devices, apparatus or equipment associated with agricultural operations conducted on agricultural property.
- (f) Federal or state preempted activities. Any activity to the extent regulation has been preempted by state or federal law is exempt from the provisions of this chapter.
- (g) County expressway system. The entirety of the County expressway system, including existing and proposed facilities, is exempt from the provisions of Section B11-152.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-157. - Variance permit procedure.

- (a) Purpose. The Director is authorized to grant a variance from any provision of this chapter by a variance permit.
- (b) Application and fees. Any person seeking a variance pursuant to this section must file an application with the Department. The application must be accompanied by a fee in an amount established by the Board of Supervisors. A separate application must be filed for each noise source; however, several mobile sources under common ownership or several fixed sources on a single property may be combined into one application.
- (c) Standards for issuance of variance. The purpose advanced by variance and disturbance created by the variance must not create a nuisance and will not be detrimental to the public health and safety. Variances will not be granted for a term exceeding 120 days, except that upon application and hearing as provided for in this chapter a variance may be renewed.
- (d) Time and place of hearing. Upon the filing of a sufficient and proper application and the payment of filing fee, the Director will fix a time and place for a public hearing.
- (e) Notice of hearing. The Director will ensure that a notice of the hearing is mailed to the owners of all property within 300 feet of the property affected by the application at their last-known addresses as are shown in the most recent records of the County Assessor. The notice must be mailed at least five days before the date of the public hearing. A similar notice must be mailed to the applicant.
- (f) Conditions. In approving a variance permit, the Director may include the conditions that are reasonable and necessary under the circumstances to protect the public health, safety and welfare from adverse effects caused by the noise emanating therefrom and may limit the term of the permit.
- (g) Findings and decision. The Director, on the basis of the evidence submitted at the hearing, may grant a variance permit with any conditions deemed necessary and reasonable.
- (h) Notice of grant. Upon the grant of an application for a variance permit, the Director will prepare and deliver to the applicant a formal statement that states the facts and conditions of the grant. No decision is final regarding an application for a variance permit until the appeal deadline has elapsed.
- (i) Appeals to Board of Supervisors.
 - (1) Any person dissatisfied with the decision of the Director may file an appeal with the Board of Supervisors within 15 calendar days after the decision. The Director will transmit to the Board of Supervisors all maps, records, papers and files that constitute the record in the action from which the appeal was taken. At the time of the filing of the appeal, the appellant must pay a filing fee in an amount established by resolution of the Board of Supervisors.

- (2) The Board of Supervisors will, within 30 days of the filing of the appeal, set the time and place for the appeal to be heard by the Board of Supervisors and will ensure that notice of the hearing is given, five days before the date of the hearing. The Board of Supervisors will hear the matter de novo and may approve, disapprove or conditionally approve the application. The decision of the Board of Supervisors is final.
- (j) Revocation of variance.
- (1) The Director may hold a hearing for modifying or revoking any permit or variance that has been granted pursuant to the provisions of this chapter. Public hearings will be held and notice given in accordance with the provisions of this section. Written notice of the hearing will also be served upon any persons making use of or relying upon any permit or variance to be modified or revoked not less than five days prior to the date of the hearing.
 - (2) After a public hearing, the Director may revoke or modify a permit on one or more of the following grounds:
 - a. That the approval was obtained by fraud; or
 - b. That any person making use of or relying upon the permit or variance is violating or has violated any conditions of the permit or variance, or that the use of the permit or variance was granted is being or has been exercised contrary to the terms or conditions of the approval; or
 - c. That the use of the approval is detrimental to the public health or safety, or is a nuisance.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-158. - Enforcement.

- (a) Prima facie violations. Any noise exceeding the noise level limits specified in Sections B11-152 and B11-153 or the prohibited actions as specified in Section B11-154 of this chapter will be deemed to be prima facie evidence of a violation of this chapter and prima facie evidence of irreparable harm.
- (b) Violations; remedies; injunctions.
 - (1) As a remedy, the operation or maintenance of any device, instrument, vehicle or machinery in violation of any provision of this chapter that causes or creates sound levels or vibrations exceeding the allowable limits as specified in this chapter is hereby declared to be a public nuisance and may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction. Additionally, no provision of this chapter will be construed to impair any common law or statutory cause of action, or legal remedy of any person for injury or damage arising from any violation of this chapter or from other law.
 - (2) Any person who knowingly and willfully violates an injunctive order obtained pursuant to the authority of this section will be deemed guilty of a misdemeanor and upon conviction will be sentenced to a term of imprisonment not to exceed five days or a fine not to exceed \$500.00, or both.
- (c) Citizen suits. Any person may commence a civil action against any other person who is alleged to be in violation of any provision of this chapter. Any person commencing civil action under this chapter will serve a copy of any complaint upon County Counsel.

(Ord. No. NS-517.72, § 2, 4-15-03)

Sec. B11-159. - Reserved.

Division B3, CHAPTER VIII. - OUTDOOR AMPLIFIED SOUND PERMIT

Sec. B3-164. - Purpose and intent.

It is the intent of the Board of Supervisors in enacting this chapter to secure and promote public health, comfort, safety and welfare of residents and protect them from the public nuisance of loud and unnecessary noise by reasonably regulating the use of outdoor amplified sound at events and activities incidental to commercial, industrial, or institutional facilities, which are not otherwise conducted pursuant to a permit or license issued by the County.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-165. - Definitions.

As used in this chapter, the following terms and phrases have the indicated meanings:

- (a) A-weighted sound level means the sound pressure level in decibels as measured on a sound level meter using the A-weighted network. The level so read is designated dB(A) or dBA.
- (b) Amplified sound means any sound amplified with a machine or device that magnifies the human voice, music or any other sound. This definition includes amplified sound associated with live bands, spoken voice, DJs, and stereo equipment; and includes brass instruments that are not played with mutes. This definition does not include string instruments that produce sound through entirely acoustic means.
- (c) Applicant means any person, partnership, association, corporation or other entity that seeks an amplified sound permit from the Zoning Administrator to conduct or sponsor events governed by this chapter.
- (d) Decibel means a unit for measuring the amplitude of sound, equal to 20 times the logarithm to the base ten of the ratio of the pressure of the sound measured to the reference pressure of 20 micropascals.
- (e) Equivalent continuous sound level (Leq) means a noise parameter describing a sound level with the same energy content as the varying acoustic signal measured over a given period of time.
- (f) Event means any activity or gathering open to the public. Examples of events include, but are not limited to, receptions, ceremonies, competitions, performances, festivals, parties.
- (g) Outdoor amplified sound permit means a permit issued pursuant to this chapter.
- (h) Permit application fee means the fee to be paid by the applicant at the time the application is filed, pursuant to the fee schedule established by resolution of the Board of Supervisors.
- (i) Permittee means any person or organization issued an amplified sound permit by the Zoning Administrator.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-166. - Permit required.

Any person intending to conduct, organize, or set up an event at a commercial, industrial or institutional facility, where the use of outdoor amplified sound is proposed, shall first obtain an outdoor amplified sound permit. An outdoor amplified sound permit is also required where the amplified sound source is within an enclosed building and the sound permeating the building from windows, doors, or

walls exceeds 55 dB(A) Leq, measured 20 feet from any portion of the building from which the sound is emanating.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-167. - Exceptions from the permit requirement.

An outdoor amplified sound permit shall not be required under this chapter for the following:

- (a) Outdoor amplified sound where the maximum A-weighted sound level, measured 20 feet from the speaker or sound source, is less than or equal to 55 dB(A) Leq between the hours of 7:00 a.m. and 10:00 p.m. and 45 dB(A) Leq between the hours of 10:00 p.m. and 7:00 a.m.
- (b) Outdoor amplified sound conducted pursuant to a permit or license issued by the County, including, but not limited to, a use permit, special permit, architecture and site approval, public dance permit, or entertainment permit.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-168. - Application for outdoor amplified sound permit.

A written application for an outdoor amplified sound permit shall be filed with Zoning Administrator in the Department of Planning and Development at least 90 days prior to the proposed date of the first event. The application shall be accompanied by an application fee in an amount established by resolution of the Board of Supervisors. The application shall include the following information:

- (a) The name, present address, and telephone number of the applicant, and if the applicant is a partnership or other association, the names, addresses, and telephone numbers of the managing partners thereof, and if the applicant is a corporation, the names, addresses, and telephone numbers of the officers and directors thereof. The address and telephone number of the principal place of business of the applicant shall also be included in the application.
- (b) The address and assessor's parcel number for the real property where the events are proposed to be conducted. The applicant shall also furnish proof of ownership of the real property or the written consent of the property owners.
- (c) A general description of the sound to be amplified (speech, music, or both), the sound amplifying equipment which is to be used, and the proposed hours of operation when the sound will occur.
- (d) Site plan showing the property boundaries, buildings, structures, patios, proposed location of sound amplifying equipment and speakers on the property, and direction of speakers.
- (e) Acoustical evaluation conducted in accordance with the Guidelines and Standards—Acoustical Evaluation of Outdoor Amplified Sound prepared by the Department of Planning and Development.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-169. - Review, notice and hearing.

- (a) Review. Within 30 days after the application is submitted, the Zoning Administrator shall inform the applicant in writing if the application is complete and acceptable for processing, or that the application is incomplete and that additional information, as specified in the letter, shall be provided. After an application has been deemed complete, the Planning Office may require submittal of additional information to determine the sound exposure of the project. If the application has been deemed incomplete, the requested materials must be submitted and the application deemed

complete within six months of the Zoning Administrator's letter. If the application is not deemed complete within six months then the application will be deemed abandoned, and the application fees shall not be refunded.

- (b) Notice. The Zoning Administrator shall prepare a notice of the proposed amplified sound permit that shall be mailed to owners of all real property located within 300 feet of the subject property boundaries at their addresses as shown on the most current property tax roll of Santa Clara County, or of a neighboring county. If there are fewer than 24 properties within 300 feet, the notification radius shall be extended to include the 24 closest properties. The notice shall include a summary project description, available means of obtaining more detailed information, and the proposed action date by the Zoning Administrator. The notice shall also state that the application for outdoor amplified sound will be placed on a public hearing agenda if requested by the notice recipient, or by any other member of the public, within a specified time period. The Zoning Administrator shall take an action on a outdoor amplified sound permit no sooner than 20 days following the mailing of the notice described in this section.
- (c) Hearing. If the applicant, any member of the public, the Planning Director, or Director of the Department of Environmental Health, requests that a public hearing be held, the application shall be placed on a Zoning Administration agenda. Notice of the public hearing shall be provided ten days prior to the scheduled hearing, in accordance with all applicable state laws. The notice shall include the date, time and place of the hearing, the identity of the hearing officer, a general explanation of the matter to be considered, and a general description of the property location. Notice is required to be mailed or delivered to the following individuals and agencies:
 - (1) The applicant at the address shown on the application;
 - (2) The owners of all real property located within 300 feet of the subject property boundaries at their addresses shown on the most current property tax roll of Santa Clara County, or of a neighboring county. If there are fewer than 24 properties within 300 feet, the notification radius shall be extended to include the 24 closest properties.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-170. - Action by zoning administrator.

- (a) The Zoning Administrator shall issue an outdoor amplified sound permit if all of the following findings are made:
 - (1) The proposed use of outdoor amplified sound complies with the thresholds and requirements of the County Noise Ordinance (Division B11, Chapter VIII).
 - (2) The proposed use of outdoor amplified sound complies with the County's General Plan.
 - (3) The proposed use of outdoor amplified sound will not be detrimental to the adjacent area because of excessive noise.
- (b) The outdoor amplified sound permit shall be subject to the following standard conditions of approval:
 - (1) The permittee shall establish and maintain an on-site noise complaint hotline to respond to noise complaints during events.
 - (2) The permittee shall install signs at the public entrance of the facility identifying the contact information for the on-site noise complaint hotline and contact information for the Santa Clara County Department of Environmental Health.
 - (3) All contracts between the applicant and those using the facility when the event will include outdoor amplified noise shall reference any required control measure required to minimize noise impacts, including, but not limited to, hours of operation or direction of speakers.

- (c) The Zoning Administrator may impose other reasonable conditions of approval necessary to minimize the noise impacts to ensure compliance with the County Noise Ordinance (Division B11, Chapter VIII) and the General Plan.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-171. - Appeal.

- (a) Within 15 calendar days after the decision of the Zoning Administrator on the application for an outdoor amplified sound permit, any person dissatisfied with the decision may appeal to the Planning Commission by filing an appeal with the Planning Office. The appeal application shall be accompanied by a nonrefundable fee in an amount established by resolution of the Board of Supervisors.
- (b) The Planning Office shall fix the time and place for the appeal to be heard by the Planning Commission. Notice of the hearing shall be made in the same manner as the noticing of the original hearing.
- (c) A hearing date for the appeal to be heard by Planning Commission shall be scheduled within 30 days after filing of the appeal.
- (d) The Zoning Administrator shall transmit to the Planning Commission all records, minutes, papers and files which constitute the record for which the appeal is made.
- (e) The Planning Commission shall hear the outdoor amplified sound permit application de novo and may approve, disapprove, or modify the decision of the Zoning Administrator. The decision of the Planning Commission on an appeal is final.
- (f) The Secretary of the Planning Commission will inform the appellant, the applicant, and the Zoning Administrator whether the appeal has been granted or denied.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-172. - Issuance of outdoor amplified sound permit.

The outdoor amplified sound permit shall be issued by the Planning Office.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-173. - Permit renewal for time-limited permit.

Requests for permit renewals of a time-limited outdoor amplified sound permit must be made in writing prior to the expiration date and must be accompanied by an application form and permit application fee. Permit renewal requests shall be processed in the same manner as the original application. Upon application for renewal, the expiration of the permit shall be stayed until a formal action has been taken on the extension request, but in no event for more than two years. If permit renewal is granted, the new approval term shall be established by the approval authority, in its discretion, and shall begin immediately after the original expiration date.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-174. - Summary suspension of outdoor amplified sound permit.

The Sheriff or designee or any authorized representative of the County may summarily suspend the outdoor amplified sound permit whenever it appears that the permittee is conducting an event in violation

of any provision of this chapter, this Code or federal or state law and such violation endangers public health or safety. Following issuance of a suspension order and within 30 days thereafter, a hearing to revoke, reaffirm or conditionally reaffirm the outdoor amplified sound permit shall be held in accordance with B3-175. Any permittee whose outdoor amplified sound permit is suspended pursuant to this section shall not conduct an event using amplified sound unless and until the Zoning Administrator, or Planning Commission on appeal, reaffirms or conditionally reaffirms the outdoor amplified sound permit under Section B3-175.

(Ord. No. NS-502.11, § 1, 12-18-12)

Sec. B3-175. - Revocation, reaffirmation or conditional reaffirmation.

Any outdoor amplified sound permit issued under this chapter may be reaffirmed, conditionally reaffirmed, or revoked based on a suspension order. A public hearing on the revocation, reaffirmation, or conditional reaffirmation will be held and noticed will be given in accordance with Section B3-169(c). The Zoning Administrator may revoke or conditionally reaffirm an outdoor amplified sound permit on any of the following grounds:

- (a) That the outdoor amplified sound permit was obtained by fraud, or false, misleading or fraudulent statements of material facts made in the application for the license or in any other document submitted pursuant to this chapter.
- (b) That any person making use of the outdoor amplified sound permit is violating or has violated any conditions of the permit.
- (c) That the detriment to the public health or safety, or the nuisance arising from the conduct of the event or from changed circumstances necessitates the revocation of the outdoor amplified sound permit or the modification or addition to the conditions of approval.
- (d) That the permittee has violated, or caused or permitted any other person to violate, any provision of this chapter or state or federal law in connection with the outdoor amplified sound permit.

An appeal to Planning Commission from the decision of the Zoning Administrator under this section may be made within 15 calendar days after the decision and in accordance with the procedures in Section B3-171.

(Ord. No. NS-502.11, § 1, 12-18-12)

Noise

Background

The overall purpose of addressing noise in general plans is to limit the exposure of the community to excessive noise levels. Various kinds of noise generators, such as airports, roads, and train corridors, are identified, evaluated, and the noise levels generated are used to guide various kinds of land use planning and development decision-making processes.

Noise on or near the Stanford campus can affect both the campus population and residents of surrounding areas. Stanford lands inside the Academic Growth Boundary, like the surrounding area, are urbanized and contain a variety of noise sources. The most notable sources include transportation-related uses such as arterial roadways, railroad tracks, and airplanes, as well as construction projects and miscellaneous sources.

Noise sources on the campus include traffic on major campus streets and adjacent arterial roadways, construction noise, and operational noise sources, such as mechanical equipment, delivery vehicles, and garbage pickup. Noise sources also include athletic events at the University's outdoor athletic facilities, including Stanford Stadium and Sunken Diamond; performances and other events at Frost Amphitheater; and Life Flight emergency helicopter landings and takeoffs at Stanford University Medical Center. Noise from these sources is intermittent and often seasonal. Its potential for impact on off-site residences is a direct function of the responsible operation of these facilities.

Growth at Stanford has the potential to increase noise on the campus and in the surrounding area through an increase in traffic and through additional construction-related noise. It also increases the campus population which may be subject to sources of excessive noise.

As part of the Community Plan environmental review process, noise sampling sites were evaluated for noise levels and projected noise levels were evaluated for potential significance by year 2010. The sites selected represent potentially noise-sensitive uses. None of these sites, including on-campus and off-campus locations along major arterial roads, were considered to result in significant and excessive noise generation. Of all the possible sources of excessive noise, construction and

operational sources are considered substantial enough to warrant special efforts to minimize noise and the impacts to humans and the natural environment.

Santa Clara County regulates noise under the standards identified in the County noise ordinance and noise element of the General Plan. The ordinance applies to all unincorporated lands, including those at Stanford University. Off-site noise impacts are evaluated at property lines, not within the campus lands.

Strategies, Policies and Implementation

Strategy #8: Prevent or Minimize Excessive Noise

The effects of noise can be reduced through either minimizing or eliminating the noise itself or through land use and development that reduces the effect of noise. Some of the means of minimizing noise conflicts include:

- Reducing activities which create noise. Trip reduction at Stanford helps reduce roadway noise both on and off the campus.
- Locating noise sources away from sensitive noise receptors (such as residences) or, conversely, locating sensitive receptors away from noise sources in new development.
- Design and construction of buildings in a manner that reduces interior noise levels.

Policies

SCP-HS 21

Identify potential noise-producing uses and determine needs for mitigation using applicable County, local, and other government standards when evaluating proposals for new Stanford facilities.

SCP-HS 22

Locate new land uses and development projects to conform with County noise compatibility standards for land uses.

SCP-HS 23

Minimize noise from construction equipment and other operational sources, through engineering solutions, hours of operation, delivery schedules, and the location of specific noise sources as far away from sensitive receptors as possible.

Implementation Recommendation

SCP-HS(i) 15

Provide noise buffers as needed and control excessive noise sources from future facilities.

SCP-HS(i) 16

Ensure compliance with the County noise ordinance and other applicable standards.

SCP-HS(i) 17

Require that Stanford design and construct new buildings with soundproofing materials as necessary and appropriate.

SCP-HS(i) 18

Require that Stanford maintain a hotline that members of the public can contact to register noise complaints.

Law Enforcement

Background

The Stanford University Department of Public Safety historically has provided law enforcement services for the University under authority delegated by the County Sheriff. However, the County Sheriff is ultimately responsible for law enforcement on Stanford's unincorporated lands. The County and the Sheriff have the responsibility to ensure that the Stanford University Department of Public Safety is staffed with qualified personnel, provides necessary law enforcement information to the Sheriff, maintains an appropriate reporting relationship with the Sheriff's office, and complies with state laws and regulations regarding public access to law enforcement information.

Traffic and Rail Noise Level Calculations

Scenario: EXISTING
Roadway: Sand Hill Road
Segment: I-280 to El Camino Real

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	29,035
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1781	34	14	1316	25	10	330	6	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.8	-15.5	-19.4	0.4	-16.8	-20.7	-5.6	-22.8	-26.8
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.6	60.1	61.4	66.3	58.8	60.0	60.3	52.8	54.0
VEHICULAR NOISE	DAY=	69.1	Leq	EVENING=	67.8	Leq	NIGHT=	61.8	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.2 CNEL= 70.8
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	52	111 240
		CNEL:	57	123 264

Scenario: **EXISTING**
 Roadway: **El Camino Real**
 Segment: **Sand Hill Road to Page Mill Road**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	35,862
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2200	42	17	1626	31	12	407	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.7	-14.6	-18.5	1.4	-15.9	-19.8	-4.6	-21.9	-25.8
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.7	64.1	65.4	70.4	62.8	64.1	64.3	56.8	58.1
VEHICULAR NOISE	DAY=	73.2	Leq	EVENING=	71.9	Leq	NIGHT=	65.8	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 74.3 CNEL= 74.9
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			Ldn: 96 207 447 CNEL: 106 228 492	

Scenario: **EXISTING**
Roadway: **El Camino Real**
Segment: **Page Mill Road to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	30,443
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1867	35	14	1380	26	10	346	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.0	-15.3	-19.2	0.7	-16.6	-20.5	-5.4	-22.6	-26.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.0	63.4	64.7	69.6	62.1	63.4	63.6	56.1	57.4
VEHICULAR NOISE	DAY=	72.5	Leq	EVENING=	71.1	Leq	NIGHT=	65.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 73.6 CNEL= 74.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	86	186 400
		CNEL:	95	205 441

Scenario: **EXISTING**
Roadway: **Page Mill Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	34,204
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2098	40	16	1551	29	12	388	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.5	-14.8	-18.7	1.2	-16.1	-20.0	-4.9	-22.1	-26.0
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.3	60.8	62.1	67.0	59.5	60.8	61.0	53.5	54.7
VEHICULAR NOISE	DAY=	69.8	Leq	EVENING=	68.5	Leq	NIGHT=	62.5	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):	Ldn=	70.9
			CNEL=	71.6
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			60 dBA	
		Ldn:	58	124
		CNEL:	63	137
			268	295

Scenario: **EXISTING**
Roadway: **Arastradero Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	15,144
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	929	18	7	687	13	5	172	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	0.4	-16.8	-20.8	-0.9	-18.2	-22.1	-6.9	-24.2	-28.1
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.2	54.6	56.8	58.9	53.3	55.5	52.9	47.3	49.5
VEHICULAR NOISE	DAY=	62.6	Leq	EVENING=	61.3	Leq	NIGHT=	55.2	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):	Ldn= 63.7	
			CNEL= 64.3	
NOISE CONTOUR:			70 dBA	65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	19	41 88
		CNEL:	21	45 97

Scenario: **EXISTING**
Roadway: **Alma Street**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	28,475
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1746	33	13	1291	24	10	323	6	2
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	1.7	-15.6	-19.5	0.4	-16.9	-20.8	-5.6	-22.9	-26.8
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.1	59.6	60.9	65.8	58.3	59.6	59.8	52.3	53.5
VEHICULAR NOISE	DAY=	68.6	Leq	EVENING=	67.3	Leq	NIGHT=	61.3	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 69.7 CNEL= 70.4
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	48	103 223
		CNEL:	53	114 245

Scenario: **EXISTING**
Roadway: **Middlefield road**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	12,492
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	766	14	6	566	11	4	142	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	-0.4	-17.7	-21.6	-1.8	-19.0	-22.9	-7.8	-25.0	-29.0
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	58.9	53.3	55.5	57.6	52.0	54.2	51.6	46.0	48.2
VEHICULAR NOISE	DAY=	61.3	Leq	EVENING=	60.0	Leq	NIGHT=	54.0	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 62.4 CNEL= 63.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	16	34 73
		CNEL:	17	37 80

Scenario: **EXISTING**
 Roadway: **University Avenue**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	19,022
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1167	22	9	862	16	7	216	4	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.4	-15.9	-19.8	0.1	-17.2	-21.1	-5.9	-23.2	-27.1
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.8	55.2	57.4	59.5	53.9	56.1	53.4	47.9	50.0
VEHICULAR NOISE	DAY=	63.2	Leq	EVENING=	61.8	Leq	NIGHT=	55.8	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 64.3 CNEL= 64.9
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	21	45 96
		CNEL:	23	49 106

Scenario: **EXISTING**
 Roadway: **Embarcadero Road**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	24,859
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1525	29	12	1127	21	9	282	5	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	2.5	-14.7	-18.6	1.2	-16.0	-20.0	-4.8	-22.0	-26.0
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	62.3	56.7	58.9	61.0	55.4	57.6	55.0	49.4	51.6
VEHICULAR NOISE	DAY=	64.7	Leq	EVENING=	63.4	Leq	NIGHT=	57.4	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 65.8 CNEL= 66.4
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	26	57 122
		CNEL:	29	62 134

Scenario: **EXISTING**
Roadway: **Oregon Expressway**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	30,925
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1897	36	14	1402	26	11	351	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.0	-15.2	-19.2	0.7	-16.5	-20.5	-5.3	-22.5	-26.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.9	60.4	61.6	66.6	59.1	60.3	60.6	53.0	54.3
VEHICULAR NOISE	DAY=	69.4	Leq	EVENING=	68.1	Leq	NIGHT=	62.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.5 CNEL= 71.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	54 116 250	
		CNEL:	59 128 275	

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **EXISTING** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Charleston Road** Analyst: **NJF**
 Segment: **El Camino Real to San Antonio Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	12,371
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	759	14	6	561	11	4	140	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	-0.5	-17.7	-21.7	-1.8	-19.0	-23.0	-7.8	-25.0	-29.0
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	59.0	53.5	55.7	57.7	52.1	54.3	51.7	46.1	48.3
VEHICULAR NOISE	DAY=	61.4	Leq	EVENING=	60.1	Leq	NIGHT=	54.1	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 62.5 CNEL= 63.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):				Ldn: 16 34 74 CNEL: 17 38 81

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **EXISTING**
 Roadway: **San Antonio Road**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	35,885
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2201	42	17	1627	31	12	407	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.7	-14.6	-18.5	1.4	-15.9	-19.8	-4.6	-21.9	-25.8
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.5	61.0	62.3	67.2	59.7	61.0	61.2	53.7	55.0
VEHICULAR NOISE	DAY=	70.0	Leq	EVENING=	68.7	Leq	NIGHT=	62.7	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			Ldn=	71.1
			CNEL=	71.8
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			Ldn:	60
			CNEL:	66
			128	276
			141	304

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **EXISTING** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Foothill /Junipero Serra** Analyst: **NJF**
 Segment: **Sand Hill Road to Arastradero Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	15,580
SPEED (mph)	45
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	956	18	7	706	13	5	177	3	1
Speed in MPH	45	45	45	45	45	45	45	45	45
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	69.3	77.6	82.1	69.3	77.6	82.1	69.3	77.6	82.1
ADJUSTMENTS									
Flow	-2.0	-19.3	-23.2	-3.3	-20.6	-24.5	-9.4	-26.6	-30.6
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.3	58.3	58.9	65.9	57.0	57.5	59.9	51.0	51.5
VEHICULAR NOISE	DAY=	68.3	Leq	EVENING=	67.0	Leq	NIGHT=	61.0	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			Ldn=	69.4
			CNEL=	70.0
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			Ldn:	46
			CNEL:	50
			60 dBA	211
				233

Scenario: EXISTING NO PROJECT
Roadway: Highway 101
Segment: San Antonio Road to Embarcadero Road

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	#####
SPEED (mph)	65
ROAD NEAR-FAR LN. DIST.	130
DISTANCE ROAD CL (ft)	100
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	14107	266	107	10427	197	79	2612	49	20
Speed in MPH	65	65	65	65	65	65	65	65	65
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	75.5	81.7	85.2	75.5	81.7	85.2	75.5	81.7	85.2
ADJUSTMENTS									
Flow	8.1	-9.2	-13.1	6.7	-10.5	-14.4	0.7	-16.5	-20.5
Distance	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	80.8	69.7	69.2	79.5	68.4	67.9	73.4	62.4	61.9
VEHICULAR NOISE	DAY=	81.4	Leq	EVENING=	80.1	Leq	NIGHT=	74.0	Leq

RESULTS				
NOISE LEVELS AT	100	FEET FROM CENTERLINE (dBA):		Ldn= 82.5 CNEL= 83.1
NOISE CONTOUR:		70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn: 678	1460	3145
		CNEL: 746	1607	3463

Scenario: EXISTING NO PROJECT
 Roadway: US 280
 Segment: El Monte Avenue to Page Mill Road

Project: Palo Alto Comprehensive Plan
 Analyst: NJF
 Date: 04-Nov-15

ROADWAY INPUTS	
ADT	#####
SPEED (mph)	65
ROAD NEAR-FAR LN. DIST.	120
DISTANCE ROAD CL (ft)	100
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	6808	129	52	5032	95	38	1260	24	10
Speed in MPH	65	65	65	65	65	65	65	65	65
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	75.5	81.7	85.2	75.5	81.7	85.2	75.5	81.7	85.2
ADJUSTMENTS									
Flow	4.9	-12.3	-16.3	3.6	-13.7	-17.6	-2.4	-19.7	-23.6
Distance	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	77.3	66.2	65.7	76.0	64.9	64.4	69.9	58.9	58.4
VEHICULAR NOISE	DAY=	77.9	Leq	EVENING=	76.6	Leq	NIGHT=	70.5	Leq

RESULTS				
NOISE LEVELS AT	100	FEET FROM CENTERLINE (dBA):		Ldn= 79.0 CNEL= 79.6
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	396	853 1838
		CNEL:	436	939 2024

Scenario: SCENARIO 1
Roadway: Sand Hill Road
Segment: I-280 to El Camino Real

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	37,075
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2274	43	17	1681	32	13	421	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.8	-14.4	-18.4	1.5	-15.7	-19.7	-4.5	-21.7	-25.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	61.2	62.4	67.4	59.8	61.1	61.4	53.8	55.1
VEHICULAR NOISE	DAY=	70.2	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 71.3 CNEL= 71.9
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	61	131 282
		CNEL:	67	144 311

Scenario: **SCENARIO 1**
Roadway: **El Camino Real**
Segment: **Sand Hill Road to Page Mill Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	43,581
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2673	50	20	1976	37	15	495	9	4
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.5	-13.7	-17.7	2.2	-15.0	-19.0	-3.8	-21.0	-25.0
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.5	65.0	66.3	71.2	63.7	64.9	65.2	57.7	58.9
VEHICULAR NOISE	DAY=	74.0	Leq	EVENING=	72.7	Leq	NIGHT=	66.7	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 75.1 CNEL= 75.7
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	110	236 508
		CNEL:	121	260 560

Scenario: **SCENARIO 1**
Roadway: **El Camino Real**
Segment: **Page Mill Road to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	38,209
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2343	44	18	1732	33	13	434	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.0	-14.3	-18.2	1.6	-15.6	-19.6	-4.4	-21.6	-25.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.9	64.4	65.7	70.6	63.1	64.4	64.6	57.1	58.4
VEHICULAR NOISE	DAY=	73.4	Leq	EVENING=	72.1	Leq	NIGHT=	66.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 74.5 CNEL= 75.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	100	216 466
		CNEL:	110	238 513

Scenario: **SCENARIO 1**
Roadway: **Page Mill Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	38,995
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2392	45	18	1768	33	13	443	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.0	-14.2	-18.2	1.7	-15.5	-19.5	-4.3	-21.5	-25.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.9	61.4	62.6	67.6	60.1	61.3	61.6	54.1	55.3
VEHICULAR NOISE	DAY=	70.4	Leq	EVENING=	69.1	Leq	NIGHT=	63.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 71.5 CNEL= 72.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	63	136 292
		CNEL:	69	149 322

Scenario: **SCENARIO 1**
Roadway: **Arastradero Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	21,605
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1325	25	10	979	18	7	245	5	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.9	-15.3	-19.3	0.6	-16.6	-20.6	-5.4	-22.6	-26.6
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.7	56.1	58.3	60.4	54.8	57.0	54.4	48.8	51.0
VEHICULAR NOISE	DAY=	64.1	Leq	EVENING=	62.8	Leq	NIGHT=	56.8	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 65.2 CNEL= 65.8
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	24	52 111
		CNEL:	26	57 122

Scenario: **SCENARIO 1**
Roadway: **Alma Street**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	34,596
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2122	40	16	1568	30	12	393	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.5	-14.7	-18.7	1.2	-16.0	-20.0	-4.8	-22.0	-26.0
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.0	60.5	61.7	66.7	59.1	60.4	60.7	53.1	54.4
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.2	Leq	NIGHT=	62.2	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.6 CNEL= 71.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	55 118 254	
		CNEL:	60 130 279	

Scenario: **SCENARIO 1**
Roadway: **Middlefield road**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	13,513
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	829	16	6	613	12	5	153	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	-0.1	-17.3	-21.3	-1.4	-18.7	-22.6	-7.4	-24.7	-28.6
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	59.3	53.7	55.9	58.0	52.4	54.6	52.0	46.4	48.6
VEHICULAR NOISE	DAY=	61.7	Leq	EVENING=	60.4	Leq	NIGHT=	54.3	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 62.8 CNEL= 63.4
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	16	35 76
		CNEL:	18	39 84

Scenario: **SCENARIO 1**
Roadway: **University Avenue**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	20,226
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1241	23	9	917	17	7	230	4	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.7	-15.6	-19.5	0.3	-16.9	-20.9	-5.7	-22.9	-26.9
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.0	55.4	57.6	59.7	54.1	56.3	53.7	48.1	50.3
VEHICULAR NOISE	DAY=	63.4	Leq	EVENING=	62.1	Leq	NIGHT=	56.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 64.5 CNEL= 65.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	22	46 100
		CNEL:	24	51 110

Scenario: **SCENARIO 1**
Roadway: **Embarcadero Road**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	32,646
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2002	38	15	1480	28	11	371	7	3
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	3.7	-13.5	-17.5	2.4	-14.8	-18.8	-3.6	-20.8	-24.8
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	63.5	57.9	60.1	62.2	56.6	58.8	56.2	50.6	52.8
VEHICULAR NOISE	DAY=	65.9	Leq	EVENING=	64.6	Leq	NIGHT=	58.6	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 67.0 CNEL= 67.6
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	32	68 146
		CNEL:	35	75 161

Scenario: **SCENARIO 1**
Roadway: **Oregon Expressway**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	31,940
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1959	37	15	1448	27	11	363	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.2	-15.1	-19.0	0.9	-16.4	-20.3	-5.2	-22.4	-26.3
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.0	60.5	61.8	66.7	59.2	60.5	60.7	53.2	54.4
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.2	Leq	NIGHT=	62.2	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.6 CNEL= 71.3
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	55 119 256	
		CNEL:	61 131 281	

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 1** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Charleston Road** Analyst: **NJF**
 Segment: **El Camino Real to San Antonio Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	16,625
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1020	19	8	754	14	6	189	4	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	0.8	-16.4	-20.4	-0.5	-17.8	-21.7	-6.5	-23.8	-27.7
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.3	54.7	56.9	59.0	53.4	55.6	53.0	47.4	49.6
VEHICULAR NOISE	DAY=	62.7	Leq	EVENING=	61.4	Leq	NIGHT=	55.4	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 63.8 CNEL= 64.4
NOISE CONTOUR:		70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	Ldn:	19	42	90
	CNEL:	21	46	99

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 1**
 Roadway: **San Antonio Road**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	37,745
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2315	44	18	1711	32	13	429	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.3	-18.3	1.6	-15.7	-19.6	-4.4	-21.7	-25.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.8	61.2	62.5	67.4	59.9	61.2	61.4	53.9	55.2
VEHICULAR NOISE	DAY=	70.3	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 71.4 CNEL= 72.0
NOISE CONTOUR:		70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	Ldn:	62	133	286
	CNEL:	68	146	315

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 1** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Foothill /Junipero Serra** Analyst: **NJF**
 Segment: **Sand Hill Road to Arastradero Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	21,592
SPEED (mph)	45
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1324	25	10	979	18	7	245	5	2
Speed in MPH	45	45	45	45	45	45	45	45	45
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	69.3	77.6	82.1	69.3	77.6	82.1	69.3	77.6	82.1
ADJUSTMENTS									
Flow	-0.6	-17.9	-21.8	-1.9	-19.2	-23.1	-7.9	-25.2	-29.1
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	59.7	60.3	67.4	58.4	59.0	61.3	52.4	52.9
VEHICULAR NOISE	DAY=	69.7	Leq	EVENING=	68.4	Leq	NIGHT=	62.4	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 70.8 CNEL= 71.4
NOISE CONTOUR:		70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	Ldn:	57	122	263
	CNEL:	62	134	289

Scenario: SCENARIO 2
Roadway: Sand Hill Road
Segment: I-280 to El Camino Real

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	37,523
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2301	43	17	1701	32	13	426	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.4	-18.3	1.6	-15.7	-19.6	-4.5	-21.7	-25.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	61.2	62.5	67.4	59.9	61.2	61.4	53.9	55.1
VEHICULAR NOISE	DAY=	70.2	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 71.3 CNEL= 72.0
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	61	132 285
		CNEL:	68	145 313

Scenario: SCENARIO 2
Roadway: El Camino Real
Segment: Sand Hill Road to Page Mill Road

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	42,866
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2629	50	20	1943	37	15	487	9	4
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.5	-13.8	-17.7	2.1	-15.1	-19.1	-3.9	-21.1	-25.1
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.4	64.9	66.2	71.1	63.6	64.9	65.1	57.6	58.9
VEHICULAR NOISE	DAY=	73.9	Leq	EVENING=	72.6	Leq	NIGHT=	66.6	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 75.0 CNEL= 75.7
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	108	233 503
		CNEL:	119	257 554

Scenario: SCENARIO 2
 Roadway: El Camino Real
 Segment: Page Mill Road to San Antonio Road

Project: Palo Alto Comprehensive Plan
 Analyst: NJF
 Date: 04-Nov-15

ROADWAY INPUTS	
ADT	37,415
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2295	43	17	1696	32	13	425	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.4	-18.3	1.5	-15.7	-19.6	-4.5	-21.7	-25.7
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.8	64.3	65.6	70.5	63.0	64.3	64.5	57.0	58.3
VEHICULAR NOISE	DAY=	73.4	Leq	EVENING=	72.0	Leq	NIGHT=	66.0	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 74.4 CNEL= 75.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	99	213 459
		CNEL:	109	235 506

Scenario: SCENARIO 2
Roadway: Page Mill Road
Segment: I-280 to El Camino Real

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	37,656
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2310	44	18	1707	32	13	428	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.3	-18.3	1.6	-15.7	-19.6	-4.4	-21.7	-25.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	61.2	62.5	67.4	59.9	61.2	61.4	53.9	55.2
VEHICULAR NOISE	DAY=	70.3	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 71.3 CNEL= 72.0
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	61	132 285
		CNEL:	68	146 314

Scenario: **SCENARIO 2**
Roadway: **Arastradero Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	20,852
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1279	24	10	945	18	7	237	4	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.8	-15.5	-19.4	0.5	-16.8	-20.7	-5.5	-22.8	-26.7
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.6	56.0	58.2	60.3	54.7	56.9	54.2	48.7	50.9
VEHICULAR NOISE	DAY=	64.0	Leq	EVENING=	62.6	Leq	NIGHT=	56.6	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 65.1 CNEL= 65.7
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	23	50 109
		CNEL:	26	56 120

Scenario: **SCENARIO 2**
Roadway: **Alma Street**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	34,222
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2099	40	16	1551	29	12	389	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.5	-14.8	-18.7	1.2	-16.1	-20.0	-4.9	-22.1	-26.0
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.9	60.4	61.7	66.6	59.1	60.4	60.6	53.1	54.3
VEHICULAR NOISE	DAY=	69.4	Leq	EVENING=	68.1	Leq	NIGHT=	62.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.5 CNEL= 71.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	54	117 252
		CNEL:	60	129 277

Scenario: **SCENARIO 2**
Roadway: **Middlefield road**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	12,543
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	769	15	6	569	11	4	142	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	-0.4	-17.7	-21.6	-1.7	-19.0	-22.9	-7.7	-25.0	-28.9
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	59.0	53.4	55.6	57.6	52.1	54.3	51.6	46.0	48.2
VEHICULAR NOISE	DAY=	61.3	Leq	EVENING=	60.0	Leq	NIGHT=	54.0	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 62.4 CNEL= 63.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	16	34 73
		CNEL:	17	37 80

Scenario: **SCENARIO 2**
 Roadway: **University Avenue**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	20,146
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1236	23	9	913	17	7	229	4	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.6	-15.6	-19.6	0.3	-16.9	-20.9	-5.7	-22.9	-26.9
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.0	55.4	57.6	59.7	54.1	56.3	53.7	48.1	50.3
VEHICULAR NOISE	DAY=	63.4	Leq	EVENING=	62.1	Leq	NIGHT=	56.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 64.5 CNEL= 65.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	21	46 100
		CNEL:	24	51 110

Scenario: **SCENARIO 2**
Roadway: **Embarcadero Road**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	31,984
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1962	37	15	1450	27	11	363	7	3
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	3.6	-13.6	-17.6	2.3	-14.9	-18.9	-3.7	-20.9	-24.9
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	63.4	57.8	60.0	62.1	56.5	58.7	56.1	50.5	52.7
VEHICULAR NOISE	DAY=	65.8	Leq	EVENING=	64.5	Leq	NIGHT=	58.5	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 66.9 CNEL= 67.5
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	31	67 144
		CNEL:	34	74 159

Scenario: **SCENARIO 2**
Roadway: **Oregon Expressway**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	31,025
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1903	36	14	1406	27	11	352	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.0	-15.2	-19.1	0.7	-16.5	-20.5	-5.3	-22.5	-26.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	67.9	60.4	61.6	66.6	59.1	60.3	60.6	53.1	54.3
VEHICULAR NOISE	DAY=	69.4	Leq	EVENING=	68.1	Leq	NIGHT=	62.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.5 CNEL= 71.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	54	116 251
		CNEL:	59	128 276

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 2** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Charleston Road** Analyst: **NJF**
 Segment: **El Camino Real to San Antonio Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	15,663
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	961	18	7	710	13	5	178	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	0.5	-16.7	-20.7	-0.8	-18.0	-22.0	-6.8	-24.0	-28.0
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.1	54.5	56.7	58.8	53.2	55.4	52.7	47.2	49.4
VEHICULAR NOISE	DAY=	62.5	Leq	EVENING=	61.1	Leq	NIGHT=	55.1	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			Ldn=	63.6
			CNEL=	64.2
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			Ldn:	19
			CNEL:	20
			60 dBA	86
				44
				95

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 2**
 Roadway: **San Antonio Road**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	37,996
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2330	44	18	1722	33	13	431	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.3	-18.3	1.6	-15.6	-19.6	-4.4	-21.6	-25.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.8	61.3	62.5	67.5	60.0	61.2	61.5	53.9	55.2
VEHICULAR NOISE	DAY=	70.3	Leq	EVENING=	69.0	Leq	NIGHT=	63.0	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 71.4 CNEL= 72.0
NOISE CONTOUR:		70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	Ldn:	62	133	287
	CNEL:	68	147	316

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 2** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Foothill /Junipero Serra** Analyst: **NJF**
 Segment: **Sand Hill Road to Arastradero Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	20,928
SPEED (mph)	45
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1284	24	10	949	18	7	238	4	2
Speed in MPH	45	45	45	45	45	45	45	45	45
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	69.3	77.6	82.1	69.3	77.6	82.1	69.3	77.6	82.1
ADJUSTMENTS									
Flow	-0.8	-18.0	-21.9	-2.1	-19.3	-23.3	-8.1	-25.3	-29.3
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.5	59.6	60.1	67.2	58.3	58.8	61.2	52.2	52.8
VEHICULAR NOISE	DAY=	69.6	Leq	EVENING=	68.3	Leq	NIGHT=	62.3	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			Ldn=	70.7
			CNEL=	71.3
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			Ldn:	55
			CNEL:	61
			119	257
			131	283

Scenario: SCENARIO 3
Roadway: Sand Hill Road
Segment: I-280 to El Camino Real

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	37,619
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2307	44	18	1705	32	13	427	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.4	-18.3	1.6	-15.7	-19.6	-4.4	-21.7	-25.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	61.2	62.5	67.4	59.9	61.2	61.4	53.9	55.2
VEHICULAR NOISE	DAY=	70.2	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 71.3 CNEL= 72.0
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	61	132 285
		CNEL:	68	146 314

Scenario: **SCENARIO 3**
Roadway: **El Camino Real**
Segment: **Sand Hill Road to Page Mill Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	43,384
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2661	50	20	1967	37	15	493	9	4
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.5	-13.7	-17.7	2.2	-15.0	-19.0	-3.8	-21.1	-25.0
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.5	65.0	66.2	71.2	63.7	64.9	65.2	57.6	58.9
VEHICULAR NOISE	DAY=	74.0	Leq	EVENING=	72.7	Leq	NIGHT=	66.7	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 75.1 CNEL= 75.7
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	109	235 507
		CNEL:	120	259 558

Scenario: **SCENARIO 3**
Roadway: **El Camino Real**
Segment: **Page Mill Road to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	37,972
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2329	44	18	1721	33	13	431	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.3	-18.3	1.6	-15.6	-19.6	-4.4	-21.6	-25.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	71.9	64.4	65.7	70.6	63.1	64.3	64.6	57.1	58.3
VEHICULAR NOISE	DAY=	73.4	Leq	EVENING=	72.1	Leq	NIGHT=	66.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 74.5 CNEL= 75.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	100	215 464
		CNEL:	110	237 511

Scenario: **SCENARIO 3**
Roadway: **Page Mill Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	38,477
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2360	45	18	1744	33	13	437	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.0	-14.3	-18.2	1.7	-15.6	-19.5	-4.3	-21.6	-25.5
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.8	61.3	62.6	67.5	60.0	61.3	61.5	54.0	55.3
VEHICULAR NOISE	DAY=	70.3	Leq	EVENING=	69.0	Leq	NIGHT=	63.0	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):	Ldn=	71.4
			CNEL=	72.1
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			60 dBA	
		Ldn:	62	134
		CNEL:	69	148
			289	319

Scenario: **SCENARIO 3**
Roadway: **Arastradero Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	21,200
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1300	25	10	961	18	7	241	5	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.9	-15.4	-19.3	0.5	-16.7	-20.7	-5.5	-22.7	-26.7
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.6	56.1	58.2	60.3	54.7	56.9	54.3	48.7	50.9
VEHICULAR NOISE	DAY=	64.0	Leq	EVENING=	62.7	Leq	NIGHT=	56.7	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 65.1 CNEL= 65.8
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	24	51 110
		CNEL:	26	56 121

Scenario: **SCENARIO 3**
Roadway: **Alma Street**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	34,535
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2118	40	16	1566	30	12	392	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.5	-14.7	-18.7	1.2	-16.0	-20.0	-4.8	-22.1	-26.0
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.0	60.4	61.7	66.7	59.1	60.4	60.6	53.1	54.4
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.2	Leq	NIGHT=	62.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.6 CNEL= 71.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	55 118 253	
		CNEL:	60 129 279	

Scenario: **SCENARIO 3**
Roadway: **Middlefield road**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	12,601
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	773	15	6	571	11	4	143	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	-0.4	-17.6	-21.6	-1.7	-19.0	-22.9	-7.7	-25.0	-28.9
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	59.0	53.4	55.6	57.7	52.1	54.3	51.7	46.1	48.3
VEHICULAR NOISE	DAY=	61.4	Leq	EVENING=	60.1	Leq	NIGHT=	54.0	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 62.5 CNEL= 63.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	16	34 73
		CNEL:	17	37 80

Scenario: **SCENARIO 3**
Roadway: **University Avenue**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	20,220
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1240	23	9	917	17	7	230	4	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.6	-15.6	-19.5	0.3	-16.9	-20.9	-5.7	-22.9	-26.9
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.0	55.4	57.6	59.7	54.1	56.3	53.7	48.1	50.3
VEHICULAR NOISE	DAY=	63.4	Leq	EVENING=	62.1	Leq	NIGHT=	56.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 64.5 CNEL= 65.1
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	22	46 100
		CNEL:	24	51 110

Scenario: **SCENARIO 3**
 Roadway: **Embarcadero Road**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	32,794
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2011	38	15	1487	28	11	372	7	3
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	3.7	-13.5	-17.4	2.4	-14.8	-18.8	-3.6	-20.8	-24.8
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	63.5	57.9	60.1	62.2	56.6	58.8	56.2	50.6	52.8
VEHICULAR NOISE	DAY=	65.9	Leq	EVENING=	64.6	Leq	NIGHT=	58.6	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 67.0 CNEL= 67.6
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	32	68 147
		CNEL:	35	75 162

Scenario: **SCENARIO 3**
Roadway: **Oregon Expressway**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	31,720
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1945	37	15	1438	27	11	360	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.1	-15.1	-19.1	0.8	-16.4	-20.4	-5.2	-22.4	-26.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.0	60.5	61.7	66.7	59.2	60.4	60.7	53.2	54.4
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.2	Leq	NIGHT=	62.2	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.6 CNEL= 71.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	55 118 254	
		CNEL:	60 130 280	

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 3** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Charleston Road** Analyst: **NJF**
 Segment: **El Camino Real to San Antonio Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	16,035
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	983	19	7	727	14	6	182	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	0.6	-16.6	-20.6	-0.7	-17.9	-21.9	-6.7	-23.9	-27.9
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.2	54.6	56.8	58.9	53.3	55.5	52.8	47.3	49.5
VEHICULAR NOISE	DAY=	62.6	Leq	EVENING=	61.2	Leq	NIGHT=	55.2	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			Ldn=	63.7
			CNEL=	64.3
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			Ldn:	19
			CNEL:	21
			60 dBA	88
				96

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 3**
 Roadway: **San Antonio Road**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	37,669
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2310	44	18	1708	32	13	428	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.3	-18.3	1.6	-15.7	-19.6	-4.4	-21.7	-25.6
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	61.2	62.5	67.4	59.9	61.2	61.4	53.9	55.2
VEHICULAR NOISE	DAY=	70.3	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 71.3 CNEL= 72.0
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):				Ldn: 61 132 285 CNEL: 68 146 314

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 3** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Foothill /Junipero Serra** Analyst: **NJF**
 Segment: **Sand Hill Road to Arastradero Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	21,213
SPEED (mph)	45
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1301	25	10	962	18	7	241	5	2
Speed in MPH	45	45	45	45	45	45	45	45	45
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	69.3	77.6	82.1	69.3	77.6	82.1	69.3	77.6	82.1
ADJUSTMENTS									
Flow	-0.7	-17.9	-21.9	-2.0	-19.2	-23.2	-8.0	-25.3	-29.2
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.6	59.6	60.2	67.3	58.3	58.9	61.3	52.3	52.9
VEHICULAR NOISE	DAY=	69.6	Leq	EVENING=	68.3	Leq	NIGHT=	62.3	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 70.7 CNEL= 71.4
NOISE CONTOUR:		70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	Ldn:	56	121	260
	CNEL:	62	133	286

Scenario: SCENARIO 4
Roadway: Sand Hill Road
Segment: I-280 to El Camino Real

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	37,166
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2280	43	17	1685	32	13	422	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.8	-14.4	-18.4	1.5	-15.7	-19.7	-4.5	-21.7	-25.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	61.2	62.4	67.4	59.9	61.1	61.4	53.8	55.1
VEHICULAR NOISE	DAY=	70.2	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 71.3 CNEL= 71.9
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	61	131 283
		CNEL:	67	145 311

Scenario: **SCENARIO 4**
Roadway: **El Camino Real**
Segment: **Sand Hill Road to Page Mill Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	44,176
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2709	51	21	2003	38	15	502	9	4
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.6	-13.7	-17.6	2.3	-15.0	-18.9	-3.7	-21.0	-24.9
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.6	65.1	66.3	71.3	63.7	65.0	65.2	57.7	59.0
VEHICULAR NOISE	DAY=	74.1	Leq	EVENING=	72.8	Leq	NIGHT=	66.7	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 75.2 CNEL= 75.8
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	111 238 513	
		CNEL:	122 262 565	

Scenario: SCENARIO 4
Roadway: El Camino Real
Segment: Page Mill Road to San Antonio Road

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	38,347
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	84
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2352	44	18	1738	33	13	435	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.0	-14.3	-18.2	1.7	-15.6	-19.5	-4.4	-21.6	-25.6
Distance	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	72.0	64.4	65.7	70.6	63.1	64.4	64.6	57.1	58.4
VEHICULAR NOISE	DAY=	73.5	Leq	EVENING=	72.1	Leq	NIGHT=	66.1	Leq

RESULTS									
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):					Ldn=	74.6	
							CNEL=	75.2	
NOISE CONTOUR:							70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):						Ldn:	101	217	467
						CNEL:	111	239	514

Scenario: SCENARIO 4
Roadway: Page Mill Road
Segment: I-280 to El Camino Real

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	39,372
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2415	46	18	1785	34	14	447	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	3.1	-14.2	-18.1	1.8	-15.5	-19.4	-4.2	-21.5	-25.4
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.9	61.4	62.7	67.6	60.1	61.4	61.6	54.1	55.4
VEHICULAR NOISE	DAY=	70.4	Leq	EVENING=	69.1	Leq	NIGHT=	63.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 71.5 CNEL= 72.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	63	136 294
		CNEL:	70	150 324

Scenario: **SCENARIO 4**
Roadway: **Arastradero Road**
Segment: **I-280 to El Camino Real**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	21,022
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1289	24	10	953	18	7	239	5	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.8	-15.4	-19.4	0.5	-16.7	-20.7	-5.5	-22.7	-26.7
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.6	56.0	58.2	60.3	54.7	56.9	54.3	48.7	50.9
VEHICULAR NOISE	DAY=	64.0	Leq	EVENING=	62.7	Leq	NIGHT=	56.7	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):	Ldn=	65.1
			CNEL=	65.7
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			60 dBA	
		Ldn:	24	51
		CNEL:	26	56
			109	120

Scenario: **SCENARIO 4**
Roadway: **Alma Street**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	34,415
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2111	40	16	1560	29	12	391	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.5	-14.7	-18.7	1.2	-16.1	-20.0	-4.8	-22.1	-26.0
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.0	60.4	61.7	66.6	59.1	60.4	60.6	53.1	54.4
VEHICULAR NOISE	DAY=	69.5	Leq	EVENING=	68.1	Leq	NIGHT=	62.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.6 CNEL= 71.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	54 117 253	
		CNEL:	60 129 278	

Scenario: **SCENARIO 4**
Roadway: **Middlefield road**
Segment: **University Avenue to San Antonio Road**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	13,047
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	800	15	6	591	11	4	148	3	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	-0.3	-17.5	-21.4	-1.6	-18.8	-22.8	-7.6	-24.8	-28.8
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	59.1	53.5	55.7	57.8	52.2	54.4	51.8	46.2	48.4
VEHICULAR NOISE	DAY=	61.5	Leq	EVENING=	60.2	Leq	NIGHT=	54.2	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 62.6 CNEL= 63.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	16	35 75
		CNEL:	18	38 82

Scenario: **SCENARIO 4**
Roadway: **University Avenue**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	20,301
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1245	24	9	920	17	7	231	4	2
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	1.7	-15.6	-19.5	0.4	-16.9	-20.8	-5.7	-22.9	-26.9
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	61.0	55.5	57.7	59.7	54.1	56.3	53.7	48.1	50.3
VEHICULAR NOISE	DAY=	63.4	Leq	EVENING=	62.1	Leq	NIGHT=	56.1	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):	Ldn=	64.5
			CNEL=	65.2
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			60 dBA	
		Ldn:	22	47
		CNEL:	24	51
			100	110

Scenario: **SCENARIO 4**
Roadway: **Embarcadero Road**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	32,862
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	36
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2016	38	15	1490	28	11	373	7	3
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	3.8	-13.5	-17.4	2.4	-14.8	-18.7	-3.6	-20.8	-24.8
Distance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	63.5	58.0	60.2	62.2	56.6	58.8	56.2	50.6	52.8
VEHICULAR NOISE	DAY=	65.9	Leq	EVENING=	64.6	Leq	NIGHT=	58.6	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 67.0
				CNEL= 67.7
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	32	68
		CNEL:	35	75

Scenario: **SCENARIO 4**
Roadway: **Oregon Expressway**
Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
Analyst: **NJF**
Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	32,454
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1991	38	15	1471	28	11	369	7	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.2	-15.0	-19.0	0.9	-16.3	-20.3	-5.1	-22.3	-26.3
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.1	60.6	61.8	66.8	59.3	60.5	60.8	53.3	54.5
VEHICULAR NOISE	DAY=	69.6	Leq	EVENING=	68.3	Leq	NIGHT=	62.3	Leq

RESULTS				
NOISE LEVELS AT	50	FEET FROM CENTERLINE (dBA):		Ldn= 70.7 CNEL= 71.3
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	56	120 258
		CNEL:	61	132 284

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 4** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Charleston Road** Analyst: **NJF**
 Segment: **El Camino Real to San Antonio Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	16,440
SPEED (mph)	25
ROAD NEAR-FAR LN. DIST.	24
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1008	19	8	745	14	6	187	4	1
Speed in MPH	25	25	25	25	25	25	25	25	25
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	59.4	71.1	77.2	59.4	71.1	77.2	59.4	71.1	77.2
ADJUSTMENTS									
Flow	0.8	-16.5	-20.4	-0.6	-17.8	-21.8	-6.6	-23.8	-27.8
Distance	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	60.3	54.7	56.9	59.0	53.4	55.6	53.0	47.4	49.6
VEHICULAR NOISE	DAY=	62.7	Leq	EVENING=	61.4	Leq	NIGHT=	55.3	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):			Ldn=	63.8
			CNEL=	64.4
NOISE CONTOUR:			70 dBA	65 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	19	41
		CNEL:	21	46
			60 dBA	89
				98

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 4**
 Roadway: **San Antonio Road**
 Segment: **El Camino Real to Route 101**

Project: **Palo Alto Comprehensive Plan**
 Analyst: **NJF**
 Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	37,437
SPEED (mph)	35
ROAD NEAR-FAR LN. DIST.	48
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	2296	43	17	1697	32	13	425	8	3
Speed in MPH	35	35	35	35	35	35	35	35	35
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	65.1	74.8	80.0	65.1	74.8	80.0	65.1	74.8	80.0
ADJUSTMENTS									
Flow	2.9	-14.4	-18.3	1.6	-15.7	-19.6	-4.5	-21.7	-25.7
Distance	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.7	61.2	62.5	67.4	59.9	61.2	61.4	53.9	55.1
VEHICULAR NOISE	DAY=	70.2	Leq	EVENING=	68.9	Leq	NIGHT=	62.9	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 71.3
				CNEL= 71.9
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):				Ldn: 61 132 284
				CNEL: 67 145 313

FHWA RD-77-108 NOISE PREDICTION MODEL

Scenario: **SCENARIO 4** Project: **Palo Alto Comprehensive Plan**
 Roadway: **Foothill /Junipero Serra** Analyst: **NJF**
 Segment: **Sand Hill Road to Arastradero Road** Date: **04-Nov-15**

ROADWAY INPUTS	
ADT	21,489
SPEED (mph)	45
ROAD NEAR-FAR LN. DIST.	12
DISTANCE ROAD CL (ft)	50
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	1318	25	10	974	18	7	244	5	2
Speed in MPH	45	45	45	45	45	45	45	45	45
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	69.3	77.6	82.1	69.3	77.6	82.1	69.3	77.6	82.1
ADJUSTMENTS									
Flow	-0.6	-17.9	-21.8	-2.0	-19.2	-23.1	-8.0	-25.2	-29.2
Distance	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	68.6	59.7	60.3	67.3	58.4	58.9	61.3	52.4	52.9
VEHICULAR NOISE	DAY=	69.7	Leq	EVENING=	68.4	Leq	NIGHT=	62.4	Leq

RESULTS				
NOISE LEVELS AT 50 FEET FROM CENTERLINE (dBA):				Ldn= 70.8 CNEL= 71.4
NOISE CONTOUR:		70 dBA	65 dBA	60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):	Ldn:	56	122	262
	CNEL:	62	134	288

Scenario: Future
Roadway: Highway 101
Segment: San Antonio Road to Embarcadero Road

Project: Palo Alto Comprehensive Plan
Analyst: NJF
Date: 04-Nov-15

ROADWAY INPUTS	
ADT	#####
SPEED (mph)	65
ROAD NEAR-FAR LN. DIST.	130
DISTANCE ROAD CL (ft)	100
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	18339	346	139	13555	256	103	3395	64	26
Speed in MPH	65	65	65	65	65	65	65	65	65
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	75.5	81.7	85.2	75.5	81.7	85.2	75.5	81.7	85.2
ADJUSTMENTS									
Flow	9.2	-8.0	-12.0	7.9	-9.4	-13.3	1.9	-15.4	-19.3
Distance	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8	-2.8
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	81.9	70.8	70.4	80.6	69.5	69.1	74.6	63.5	63.1
VEHICULAR NOISE	DAY=	82.5	Leq	EVENING=	81.2	Leq	NIGHT=	75.2	Leq

RESULTS				
NOISE LEVELS AT	100	FEET FROM CENTERLINE (dBA):		Ldn= 83.6 CNEL= 84.2
NOISE CONTOUR:				70 dBA 65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):		Ldn:	807	1739 3746
		CNEL:	889	1914 4124

Scenario: Future
 Roadway: US 280
 Segment: El Monte Avenue to Page Mill Road

Project: Palo Alto Comprehensive Plan
 Analyst: NJF
 Date: 04-Nov-15

ROADWAY INPUTS	
ADT	#####
SPEED (mph)	65
ROAD NEAR-FAR LN. DIST.	120
DISTANCE ROAD CL (ft)	100
SOFT/HARD CONDITIONS	Soft
GRADE (%)	0%
LEFT VIEW	-90
RIGHT VIEW	90

VEHICLE MIX INPUTS			
DAILY		HOURLY	
% A	97.4%	DAY	75.5%
% MT	1.8%	EVENING	14.0%
% HT	0.7%	NIGHT	10.5%

CALCULATION AREA									
	DAYTIME			EVENING			NIGHT		
	AUTOS	MT	HT	AUTOS	MT	HT	AUTOS	MT	HT
Vehicles per hour	8850	167	67	6542	124	50	1639	31	12
Speed in MPH	65	65	65	65	65	65	65	65	65
Left angle	-90	-90	-90	-90	-90	-90	-90	-90	-90
Right angle	90	90	90	90	90	90	90	90	90
Reference levels (dBA)	75.5	81.7	85.2	75.5	81.7	85.2	75.5	81.7	85.2
ADJUSTMENTS									
Flow	6.0	-11.2	-15.2	4.7	-12.5	-16.5	-1.3	-18.5	-22.5
Distance	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2	-3.2
Finite Roadway	0	0	0	0	0	0	0	0	0
Barrier	0	0	0	0	0	0	0	0	0
Grade	0	0	0	0	0	0	0	0	0
LEQ	78.4	67.3	66.9	77.1	66.0	65.6	71.1	60.0	59.6
VEHICULAR NOISE	DAY=	79.0	Leq	EVENING=	77.7	Leq	NIGHT=	71.7	Leq

RESULTS				
NOISE LEVELS AT	100	FEET FROM CENTERLINE (dBA):	Ldn= 80.1	
			CNEL= 80.7	
NOISE CONTOUR:			70 dBA	65 dBA 60 dBA
ROAD CENTERLINE DISTANCE TO NOISE CONTOUR (FEET):			Ldn:	472 1016 2189
			CNEL:	519 1119 2411

Scenario 1 Increase over Existing

Roadway	Segment	CNEL at 50 feet (dBA)			
		No Project	With Project	Project Contribution	Potential Impact?
Sand Hill Road	I-280 to El Camino Real	70.8	71.9	1.1	no
El Camino Real	Sand Hill Road to Page Mill Road	74.9	75.7	0.8	no
El Camino Real	Page Mill Road to San Antonio Road	74.2	75.2	1.0	no
Page Mill Road	I-280 to El Camino Real	71.6	72.1	0.5	no
Arastradero Road	I-280 to El Camino Real	64.3	65.8	1.5	no
Alma Street	University Avenue to San Antonio Road	70.4	71.2	0.8	no
Middlefield road	University Avenue to San Antonio Road	63.1	63.4	0.3	no
University Avenue	El Camino Real to Route 101	64.9	65.1	0.2	no

Scenario 2 Increase over Existing

Roadway	Segment	CNEL at 50 feet (dBA)			
		No Project	With Project	Project Contribution	Potential Impact?
Sand Hill Road	I-280 to El Camino Real	70.8	72.0	1.2	no
El Camino Real	Sand Hill Road to Page Mill Road	74.9	75.7	0.8	no
El Camino Real	Page Mill Road to San Antonio Road	74.2	75.1	0.9	no
Page Mill Road	I-280 to El Camino Real	71.6	72.0	0.4	no
Arastradero Road	I-280 to El Camino Real	64.3	65.7	1.4	no
Alma Street	University Avenue to San Antonio Road	70.4	71.2	0.8	no
Middlefield road	University Avenue to San Antonio Road	63.1	63.1	0.0	no
University Avenue	El Camino Real to Route 101	64.9	65.1	0.2	no

Scenario 3 Increase over Existing

Roadway	Segment	CNEL at 50 feet (dBA)			
		No Project	With Project	Project Contribution	Potential Impact?
Sand Hill Road	I-280 to El Camino Real	70.8	72.0	1.2	no
El Camino Real	Sand Hill Road to Page Mill Road	74.9	75.7	0.8	no
El Camino Real	Page Mill Road to San Antonio Road	74.2	75.1	0.9	no
Page Mill Road	I-280 to El Camino Real	71.6	72.1	0.5	no
Arastradero Road	I-280 to El Camino Real	64.3	65.8	1.5	no
Alma Street	University Avenue to San Antonio Road	70.4	71.2	0.8	no
Middlefield road	University Avenue to San Antonio Road	63.1	63.1	0.0	no
University Avenue	El Camino Real to Route 101	64.9	65.1	0.2	no

Scenario 4 Increase over Existing

Roadway	Segment	CNEL at 50 feet (dBA)			
		No Project	With Project	Project Contribution	Potential Impact?
Sand Hill Road	I-280 to El Camino Real	70.8	71.9	1.1	no
El Camino Real	Sand Hill Road to Page Mill Road	74.9	75.8	0.9	no
El Camino Real	Page Mill Road to San Antonio Road	74.2	75.2	1.0	no
Page Mill Road	I-280 to El Camino Real	71.6	72.2	0.6	no
Arastradero Road	I-280 to El Camino Real	64.3	65.7	1.4	no
Alma Street	University Avenue to San Antonio Road	70.4	71.2	0.8	no
Middlefield road	University Avenue to San Antonio Road	63.1	63.2	0.1	no
University Avenue	El Camino Real to Route 101	64.9	65.2	0.3	no

CNEL Increase Comparison by Scenario

Roadway	Segment	CNEL Increases over Existing				
		Scenario 1 Increase	Scenario 2 Increase	Scenario 3 Increase	Scenario 4 Increase	
Sand Hill Road	I-280 to El Camino Real	1.1	1.2	1.2	1.1	
El Camino Real	Sand Hill Road to Page Mill Road	0.8	0.8	0.8	0.9	
El Camino Real	Page Mill Road to San Antonio Road	1.0	0.9	0.9	1.0	
Page Mill Road	I-280 to El Camino Real	0.5	0.4	0.5	0.6	
Arastradero Road	I-280 to El Camino Real	1.5	1.4	1.5	1.4	
Alma Street	University Avenue to San Antonio Road	0.8	0.8	0.8	0.8	
Middlefield road	University Avenue to San Antonio Road	0.3	0.0	0.0	0.1	
University Avenue	El Camino Real to Route 101	0.2	0.2	0.2	0.3	

CALTRAIN NOISE LEVELS
Palo Alto Comprehensive Plan

EXISTING				
	Ldn 100Feet	70 CNEL	65 CNEL	60 CNEL
Caltrain	65	50	109	235
		70	65	60

2035*				
	Ldn 100Feet	70 CNEL	65 CNEL	60 CNEL
Caltrain/Freight	70	53	132	490
		70	65	60

*Assumptions:

Caltrain Assumptions:

Electrification of Caltrain by 2035

Increased frequency: 19 additional daytime trips, 3 additional nighttime trips

Increased speed: 42% increase in speed to average 85 mph by 2035

*Source: Caltrain Electrification Program -
Environmental Assessment/Final
Environmental Impact Report*

Noise Model Based on Federal Transit Administration General Transit Noise Assessment
 Developed for Chicago Create Project
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 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	65	61	58
Source 1	61	58	53
Source 2	60	58	52
Source 3	58	34	52
Source 4	57	17	51
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS							
Parameter	Source 1		Source 2		Source 3		Source 4
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars 10
Distance (source to receiver)	distance (ft)	100	distance (ft)	100	distance (ft)	100	distance (ft) 100
Daytime Hours (7 AM - 10 PM)	speed (mph)	60	speed (mph)	60	speed (mph)	0	speed (mph) 0
	trains/hour	5.2	trains/hour	5.2	trains/hour	0	trains/hour 0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train 0
Nighttime Hours (10 PM - 7 AM)	speed (mph)	60	speed (mph)	60	speed (mph)	60	speed (mph) 60
	trains/hour	1.55	trains/hour	1.55	trains/hour	0.2222	trains/hour 0.2222
	locos/train	1	cars/train	5	locos/train	1	length of cars (ft) / train 500
Wheel Flats?	0.00%	% of cars w/ wheel flats	0.00%	% of cars w/ wheel flats	0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows 0

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 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	60	55	53
Source 1	55	53	47
Source 2	54	52	47
Source 3	52	28	47
Source 4	51	11	45
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS									
Parameter	Source 1			Source 2		Source 3		Source 4	
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10	
Distance (source to receiver)	distance (ft)	235	distance (ft)	235	distance (ft)	235	distance (ft)	235	
Daytime Hours (7 AM - 10 PM)	speed (mph)	60	speed (mph)	60	speed (mph)	0	speed (mph)	0	
	trains/hour	5.2	trains/hour	5.2	trains/hour	0	trains/hour	0	
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0	
Nighttime Hours (10 PM - 7 AM)	speed (mph)	60	speed (mph)	60	speed (mph)	60	speed (mph)	60	
	trains/hour	1.55	trains/hour	1.55	trains/hour	0.2222	trains/hour	0.2222	
	locos/train	1	cars/train	5	locos/train	1	length of cars (ft) / train	500	
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%	
Jointed Track?	Y/N	N	Y/N	n	Y/N	n	Y/N	n	
Embedded Track?	Y/N	N	Y/N	n	Y/N	n	Y/N	n	
Aerial Structure?	Y/N	N	Y/N	n	Y/N	n	Y/N	n	
Barrier Present?	Y/N	N	Y/N	n	Y/N	n	Y/N	n	
Intervening Rows of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0	

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 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	65	60	58
Source 1	60	58	52
Source 2	59	57	52
Source 3	57	33	52
Source 4	56	16	50
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	Source 1			Source 2		Source 3		Source 4
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	109	distance (ft)	109	distance (ft)	109	distance (ft)	109
Daytime Hours (7 AM - 10 PM)	speed (mph)	60	speed (mph)	60	speed (mph)	0	speed (mph)	0
	trains/hour	5.2	trains/hour	5.2	trains/hour	0	trains/hour	0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train	0
Nighttime Hours (10 PM - 7 AM)	speed (mph)	60	speed (mph)	60	speed (mph)	60	speed (mph)	60
	trains/hour	1.55	trains/hour	1.55	trains/hour	0.22	trains/hour	0.22
	locos/train	1	cars/train	5	locos/train	1	length of cars (ft) / train	500
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	N	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	N	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	N	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows	0

Noise Model Based on Federal Transit Administration General Transit Noise Assessment
 Developed for Chicago Create Project
 Copyright 2006, HMMH Inc.
 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	70	65	63
Source 1	65	63	58
Source 2	65	62	57
Source 3	62	38	57
Source 4	61	21	55
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS							
Parameter	Source 1		Source 2		Source 3		Source 4
Source Num.	Commuter Diesel Locomotive	2	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars 10
Distance (source to receiver)	distance (ft)	50	distance (ft)	50	distance (ft)	50	distance (ft) 50
Daytime Hours (7 AM - 10 PM)	speed (mph)	60	speed (mph)	60	speed (mph)	0	speed (mph) 0
	trains/hour	5.2	trains/hour	5.2	trains/hour	0	trains/hour 0
	locos/train	1	cars/train	5	locos/train	0	length of cars (ft) / train 0
Nighttime Hours (10 PM - 7 AM)	speed (mph)	60	speed (mph)	60	speed (mph)	60	speed (mph) 60
	trains/hour	1.55	trains/hour	1.55	trains/hour	0.22	trains/hour 0.22
	locos/train	1	cars/train	5	locos/train	1	length of cars (ft) / train 500
Wheel Flats?	0.00%	% of cars w/ wheel flats	0.00%	% of cars w/ wheel flats	0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	Y/N	n	Y/N	n	Y/N	n
Embedded Track?	Y/N	Y/N	n	Y/N	n	Y/N	n
Aerial Structure?	Y/N	Y/N	n	Y/N	n	Y/N	n
Barrier Present?	Y/N	Y/N	n	Y/N	n	Y/N	n
Intervening Rows of Buildings	number of rows	0	number of rows	0	number of rows	0	number of rows 0

Noise Model Based on Federal Transit Administration General Transit Noise Assessment
 Developed for Chicago Create Project
 Copyright 2006, HMMH Inc.
 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	70	65	63
Source 1	63	60	55
Source 2	64	62	56
Source 3	64	53	58
Source 4	65	53	59
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS								
Parameter	Source 1			Source 2		Source 3		Source 4
Source Num.	Commuter Electric Locomotive	1	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars	10
Distance (source to receiver)	distance (ft)	100	distance (ft)	100	distance (ft)	100	distance (ft)	100
Daytime Hours (7 AM - 10 PM)	speed (mph)	85	speed (mph)	85	speed (mph)	60	speed (mph)	60
	trains/hour	6.47	trains/hour	6.47	trains/hour	0.13	trains/hour	0.13
	locos/train	1	cars/train	5	locos/train	2	length of cars (ft) / train	1500
Nighttime Hours (10 PM - 7 AM)	speed (mph)	85	speed (mph)	85	speed (mph)	60	speed (mph)	60
	trains/hour	1.89	trains/hour	1.89	trains/hour	0.44	trains/hour	0.44
	locos/train	1	cars/train	5	locos/train	2	length of cars (ft) / train	1500
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%		0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	N	Y/N	n	Y/N		Y/N	
Embedded Track?	Y/N	N	Y/N	n	Y/N		Y/N	
Aerial Structure?	Y/N	N	Y/N	n	Y/N		Y/N	
Barrier Present?	Y/N	N	Y/N	n	Y/N		Y/N	
Intervening Rows of Buildings	number of rows	0	number of rows	0	number of rows		number of rows	

Noise Model Based on Federal Transit Administration General Transit Noise Assessment
 Developed for Chicago Create Project
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 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	60	54	53
Source 1	52	50	45
Source 2	54	51	46
Source 3	54	42	48
Source 4	54	43	48
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS							
Parameter	Source 1		Source 2		Source 3		Source 4
Source Num.	Commuter Electric Locomotive	1	Commuter Rail Cars	3	Freight Locomotive	9	Freight Cars 10
Distance (source to receiver)	distance (ft)	490	distance (ft)	490	distance (ft)	490	distance (ft) 490
Daytime Hours (7 AM - 10 PM)	speed (mph)	85	speed (mph)	85	speed (mph)	60	speed (mph) 60
	trains/hour	6.47	trains/hour	6.47	trains/hour	0.13	trains/hour 0.13
	locos/train	1	cars/train	5	locos/train	2	length of cars (ft) / train 1500
Nighttime Hours (10 PM - 7 AM)	speed (mph)	85	speed (mph)	85	speed (mph)	60	speed (mph) 60
	trains/hour	1.89	trains/hour	1.89	trains/hour	0.44	trains/hour 0.44
	locos/train	1	cars/train	5	locos/train	2	length of cars (ft) / train 1500
Wheel Flats?	0.00%	% of cars w/ wheel flats	0.00%	% of cars w/ wheel flats	0.00%	% of cars w/ wheel flats	0.00%
Jointed Track?	Y/N	Y/N	n	Y/N	Y/N	Y/N	Y/N
Embedded Track?	Y/N	N	Y/N	n	Y/N	Y/N	Y/N
Aerial Structure?	Y/N	N	Y/N	n	Y/N	Y/N	Y/N
Barrier Present?	Y/N	N	Y/N	n	Y/N	Y/N	Y/N
Intervening Rows of Buildings	number of rows	0	number of rows	0	number of rows	number of rows	number of rows

Noise Model Based on Federal Transit Administration General Transit Noise Assessment
 Developed for Chicago Create Project
 Copyright 2006, HMMH Inc.
 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	65	62	57
Source 1	61	58	53
Source 2	62	60	54
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS					
Parameter	Source 1		Source 2		Source 3
Source Num.	Commuter Electric Locomotive	1	Commuter Rail Cars	3	
Distance (source to receiver)	distance (ft)	132	distance (ft)	132	
Daytime Hours (7 AM - 10 PM)	speed (mph)	85	speed (mph)	85	
	trains/hour	6.47	trains/hour	6.47	
	locos/train	1	cars/train	5	
Nighttime Hours (10 PM - 7 AM)	speed (mph)	85	speed (mph)	85	
	trains/hour	1.89	trains/hour	1.89	
	locos/train	1	cars/train	5	
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%	
Jointed Track?	Y/N	N	Y/N	n	
Embedded Track?	Y/N	N	Y/N	n	
Aerial Structure?	Y/N	N	Y/N	n	
Barrier Present?	Y/N	N	Y/N	n	
Intervening Rows of Buildings	number of rows	0	number of rows	0	

Noise Model Based on Federal Transit Administration General Transit Noise Assessment
 Developed for Chicago Create Project
 Copyright 2006, HMMH Inc.
 Case: Metrolink San Bernardino

RESULTS			
Noise Source	Ldn (dB)	Leq - daytime (dB)	Leq - nighttime (dB)
All Sources	70	68	63
Source 1	67	64	59
Source 2	68	66	60
Source 3	0	0	0
Source 4	0	0	0
Source 5	0	0	0
Source 6	0	0	0
Source 7	0	0	0
Source 8	0	0	0

Enter noise receiver land use category below.

LAND USE CATEGORY	
Noise receiver land use category (1, 2 or 3)	2

Enter data for up to 8 noise sources below - see reference list for source numbers.

NOISE SOURCE PARAMETERS					
Parameter	Source 1		Source 2		Source 3
Source Num.	Commuter Electric Locomotive	1	Commuter Rail Cars	3	
Distance (source to receiver)	distance (ft)	53	distance (ft)	53	
Daytime Hours (7 AM - 10 PM)	speed (mph)	85	speed (mph)	85	
	trains/hour	6.47	trains/hour	6.47	
	locos/train	1	cars/train	5	
Nighttime Hours (10 PM - 7 AM)	speed (mph)	85	speed (mph)	85	
	trains/hour	1.89	trains/hour	1.89	
	locos/train	1	cars/train	5	
Wheel Flats?		0.00%	% of cars w/ wheel flats	0.00%	
Jointed Track?	Y/N	N	Y/N	n	
Embedded Track?	Y/N	N	Y/N	n	
Aerial Structure?	Y/N	N	Y/N	n	
Barrier Present?	Y/N	N	Y/N	n	
Intervening Rows of Buildings	number of rows	0	number of rows	0	

A P P E N D I X G

**T R A N S P O R T A T I O N I M P A C T
A N A L Y S I S**



HEXAGON TRANSPORTATION CONSULTANTS, INC.



Palo Alto Comprehensive Plan Update

Transportation Impact Analysis



Prepared for:

Placeworks, Inc.

February 2, 2016



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Executive Summary

Introduction

This report presents a Transportation Impact Analysis (TIA) of the City of Palo Alto Comprehensive Plan Update and the four hypothetical planning scenarios that were developed in order to capture the range of possible outcomes to the Comprehensive Plan Update planning process. This TIA is intended to inform decision-makers about the potential transportation impacts of the policy choices inherent in the four scenarios. The results of this TIA will be incorporated into an Environmental Impact Report (EIR) for the Comprehensive Plan Update. As explained in the EIR, the proposed “project”, for purposes of this TIA, is the adoption and implementation of an updated Comprehensive Plan, along with associated amendments to the City of Palo Alto Zoning Code.

The primary purpose of this report is to assess the impacts of growth during the life of the Comprehensive Plan Update by comparing and contrasting the different transportation-related outcomes that would occur under each of the four hypothetical planning scenarios. Each of the scenarios makes different land use assumptions regarding household growth and job growth. All of the scenarios assume that the City’s *Bicycle + Pedestrian Transportation Plan* and the Caltrain Modernization/Electrification Project will be implemented, but include different assumptions regarding other transportation investments and policies.. Table ES-1 presents a brief summary of the land use and transportation assumptions in the four scenarios; each of these assumptions will be described in more detail in later chapters..

Some of the key differences in transportation investments and land use assumptions among the four scenarios may be summarized as follows:

- Scenario 1:** The Business As Usual scenario assumes the continuation of existing Comp Plan land use designations. Only currently funded transportation infrastructure projects and network changes are included.
- Scenario 2:** Assumes that the improvements proposed by Santa Clara County in the 2040 County Expressway Plan will be constructed on Page Mill Road and Foothill Expressway. Assumes the same number of new housing units and new population as Scenario 1, but the lowest number of new employees of the four scenarios. Includes employer incentives for bicycling.
- Scenario 3:** Assumes that the Caltrain tracks will be trenched under Meadow Drive and Charleston Road. Assumes more new housing units and population than Scenarios 1 and 2, but less than Scenario 4. Assumes fewer new employees than Scenario 1, but more than Scenario 2. Includes employer incentives for bicycling and unbundled parking costs for multi-family housing units.
- Scenario 4:** Assumes that Bus Rapid Transit (BRT) will be implemented on El Camino Real, with queue-jumping lanes and signal prioritization at intersections, but not a dedicated lane for buses. Also assumes that other measures, such as free transit passes for Palo Alto residents in transit-

accessible areas and parking charges in the Downtown and California Avenue areas, will be taken to maximize the use of transit. Like Scenario 3, assumes that the Caltrain tracks will be trenched under Meadow Drive and Charleston Road. Assumes the greatest number of new housing units and new population of the four scenarios, and the same number of new employees as Scenario 1. Includes employer incentives for bicycling, unbundled parking costs for multi-family housing units, and exploring the option of putting in place a parking charge program for workplaces with over 50 employees.

Table ES- 1
Summary of Scenario Assumptions

Scenario Assumptions	2030			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
<u>Land Use - City of Palo Alto (excluding Sphere of Influence)</u>				
New Housing Units	2,720	2,720	3,545	4,420
New Population ^a	6,600	6,600	8,435	10,455
New Jobs	15,480	9,850	12,755	15,480
<u>Transportation Investments & Policies</u>				
Bicycle & Pedestrian Master Plan Improvements	Yes	Yes	Yes	Yes
CalTrain Modernization/Electrification	Yes	Yes	Yes	Yes
CalTrain Trench at Meadow and Charleston crossings	No	No	Yes	Yes
Expressway Plan Improvements on Page Mill Road and Foothill Expressways	No	Yes	No	No
Bus Rapid Transit on El Camino Real ^b	Signal Priority	Signal Priority	Signal Priority	Signal Priority & Queue Jump Lanes
Paid transit passes for employees in workplaces with >50 employees	Yes	Yes	Yes	Yes
Employer incentives for carpooling & bicycling	No	Yes	Yes	Yes
Unbundled parking costs for multi-family units	No	No	Yes	Yes
Explore parking charge program for businesses with >50 employees	No	No	No	Yes
Paid parking in Downtown and California Ave areas	No	No	No	Yes
Free transit passes for Palo Alto residents in transit-accessible areas	No	No	No	Yes
<u>Notes:</u>				
(a) Population is calculated based on a housing unit vacancy rate of 5 percent and an average household size of 2.40 persons per household in 2014 and 2.41 persons per household in 2030.				
(b) None of the scenarios include a dedicated lane for buses on El Camino Real in Palo Alto. All scenarios include curbside bulbout stations and signal priority for buses. Scenario 4 also includes curbside queue jump lanes for buses and bicycles.				

Source: Hexagon Transportation Consultants, Inc., October 2015.

The four scenarios have been compared using the Palo Alto 2030 travel demand forecasting model, which is based on the Santa Clara Valley Transportation Agency's (VTA) countywide travel demand forecasting model. Palo Alto's citywide model calculates output variables (such as mode share, transit boardings, Average Daily Traffic (ADT), and peak hour traffic volumes) projected to occur in the year 2030 based on the different input assumptions related to each of the four scenarios. The model was calibrated to 2013 conditions, based on 2013 traffic counts, and the 2030 volumes were calculated as an increment of growth over 2013 volumes in order to provide a consistent means of comparison for the four scenarios.

This TIA has been prepared in accordance with the standards and methodologies set forth by the City of Palo Alto, by the VTA Congestion Management Program's *Transportation Impact Guidelines* (October 2014), and by the California Environmental Quality Act (CEQA). The VTA administers the Congestion Management Program (CMP) for Santa Clara County.

The metrics used to conduct the comparison among scenarios are the same as those used to describe the current conditions in the *Transportation and Traffic Existing Conditions Report*, prepared earlier in the Comprehensive Plan Update process. These metrics include mode split, transit ridership, Average Daily Traffic (ADT) and Motor Vehicle Level of Service on roadway segments, vehicle miles traveled (VMT), and Motor Vehicle Level of Service (LOS) at key intersections, freeway segments, and freeway ramps. In addition, the analysis discusses travel times, evaluates a Multi-Modal Level of Service on two roadway segments, and includes an assessment of transit operations, the potential for through traffic to use local residential streets, and safety.

Summary of Findings

Each of the four scenarios has different transportation-related outcomes, which are briefly summarized below. Table ES-2 presents some of the topics discussed in this TIA that have quantitative metrics associated with them and for which the evaluation showed differences among the four scenarios.

Table ES- 2
Summary of Metrics

Comparative Metric	Existing Conditions	2030			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
<u>Mode Share</u>					
% Drive Alone	61.5%	59.9%	60.0%	59.7%	58.5%
<u>Transit Use</u>					
Number of Transit Trips	29,494	44,503	41,659	43,820	51,975
<u>Vehicle Miles Travelled (VMT)</u>					
Total Palo Alto VMT	5,320,931	5,914,158	5,741,393	5,853,201	5,788,497
<u>VMT Per Capita</u>					
Palo Alto VMT per capita	33.0	32.5	32.3	32.1	30.9
<u>Intersection Level of Service</u>					
Number of Impacted Intersections		6	3	4	5

Source: Hexagon Transportation Consultants, Inc., October 2015.

Scenario 1, the Business As Usual scenario, results in the second highest mode share for drive-alone automobiles, the highest Vehicle Miles Traveled (VMT), and the highest number of intersections with a significant impact. These results are consistent with the fact that Scenario 1 has the second highest combined total of new housing units and new jobs, but includes no specific measures to shift those trips out of automobiles. Also, Scenario 1 does not include the costly improvements included in some of the other scenarios, such as grade separations on the expressways or constructing a trench for the Caltrain tracks, which mitigate impacts in some locations.

Scenario 2 has the lowest VMT of the four scenarios because it has the lowest growth assumptions. Of the four scenarios, Scenario 2 results in the fewest number of impacted intersections, partly because it includes the least intense land use assumptions and partly because of the expressway improvements that are included for Page Mill Road and Foothill Expressway. However, because it includes few specific measures to shift trips out of automobiles, Scenario 2 has the highest auto mode share and the fewest trips by transit of the four scenarios.

Scenario 3 represents a middle ground in terms of land use assumptions, and also is the middle ground in terms of transportation outcomes. It is neither the highest nor the lowest in terms of any of the transportation metrics examined. Under Scenario 3, there would be four impacted intersections, which is less than the Business As Usual scenario, partly because it assumes that a trench would be constructed for the Caltrain tracks, which mitigates one impacted study intersection.

Scenario 4, which has the most intense land use assumptions, attempts to mitigate some of the transportation outcomes of more housing units and jobs through policies that promote transit, bicycling, and walking. It succeeds by some metrics, in that it results in the lowest mode share for Drive-Alone Auto, the highest mode share for walking, and the most transit trips of the four scenarios. As a result of these mode shifts, VMT is lower for Scenario 4 than the Business As Usual scenario, but not as low as Scenario 2. However, of the four scenarios, Scenario 4 results in five impacted intersections, indicating that the policies to promote alternative modes do not fully mitigate the additional vehicular trips generated by the additional number of housing units and jobs included in this scenario.

In terms of the potential CEQA impacts that must be evaluated as input to the EIR for this Comprehensive Plan Update, the following summarizes the findings of this TIA. Would any of the four scenarios:

- Cause an intersection to drop below its level of service standard, or if it is already operating at a substandard level of service, deteriorate by more than a specified amount? Yes, all four scenarios would result in at least one impacted intersection during the AM or PM peak hour. The table above shows the number of impacted intersections under each scenario. Even with the implementation of additional TDM-related policies and other measures to mitigate those impacts, the intersection impacts would be significant and unavoidable at five of the six impacted intersections. At the intersection of Middlefield Road and Charleston Road, implementation of a TDM mitigation program would reduce the impact to a less-than-significant level. However, all scenarios would still result in a significant and unavoidable impact at at least one intersection.
- Cause a freeway segment or ramp to operate at LOS F or contribute traffic in excess of 1% of segment capacity to a freeway segment or ramp already operating at LOS F? Yes, all four scenarios would result in significant impacts on six freeway segments during the PM peak hour and on one freeway segment during both the AM and PM peak hours. With implementation of a TDM mitigation program and other measures, the projected impact would be eliminated on three freeway segments. The TDM measures would reduce but not eliminate the impact on four of the freeway segments. These impacts are considered significant and unavoidable. None of the scenarios would cause an impact on any of the freeway ramps.
- Impede the development or function of planned pedestrian or bicycle facilities? No. Scenario 2 includes the expansion of Page Mill Road from four to six lanes between I-280 and Porter Drive, and wider roadways can generally be considered detrimental to pedestrians. However, Scenario 2 also includes construction of improved bicycle and pedestrian facilities along that segment of Page Mill Road. There are currently no pedestrian facilities at all between I-280 and Deer Creek Road. Thus, on balance, that scenario would enhance rather than degrade the bicycle and pedestrian facilities. None of the other scenarios include components that would impede the function of planned bicycle or pedestrian facilities.
- Increase demand for pedestrian and bicycle facilities that cannot be met by existing or planned facilities? No.
- Impede the operation of a transit system as a result of congestion? Yes, but with implementation of additional TDM policies, signal prioritization for buses at intersections, and queue jump lanes and curbside platforms along El Camino Real, this impact would be reduced. However, because the congestion at all intersections and roadway segments where buses operate would not be eliminated, all four scenarios would have a significant and unavoidable impact on transit operations by increasing congestion.
- Create demand for transit services that cannot be met by current or planned services? No.
- Create the potential demand for through traffic to use local residential streets? Yes, all four scenarios would result in additional traffic on arterials that could result in additional traffic being diverted from those arterials onto local residential streets. As mitigation for those impacts, the City would adopt a traffic calming program. With this program in place, it can be assumed that any impacts from traffic that may be diverted from arterials onto local residential streets could be reduced to less than significant.

- Create an operational safety hazard? No.
- Result in inadequate emergency access? No.

Summary of Mitigation Measures

In four of the above areas of potential impacts under CEQA, there would be significant impacts before taking into account any mitigation measures. The following mitigation measures would be implemented to reduce these impacts. None of these mitigation measures cause any secondary impacts to bicyclists or pedestrians..

The projected impacts at study intersections, on freeway segments, and on transit (due to increased congestion) would be significant and unavoidable even with implementation of the proposed mitigation measures, as noted above. The projected impact on local residential streets due to through traffic attempting to avoid congestion on arterials would be mitigated to a less than significant level with implementation of a traffic calming program.

Mitigation for Impacted Intersections

- a) Adopt a programmatic approach to reducing traffic with the goal of achieving no net increase in peak period motor vehicle trips from new development, with an exception for uses that directly contribute to the neighborhood character and diversity of Palo Alto (such as ground floor retail and below market rate housing). The program should, at a minimum:
 - Require new development projects to prepare and implement a Transportation Demand Management (TDM) Plan to achieve the following reduction in peak period motor vehicle trips from the rates included in the Institute of Transportation Engineers' *Trip Generation Manual* for the appropriate land use category. These reductions are deemed aggressive, yet feasible, for the districts indicated.
 - i. 45 percent reduction in the Downtown district
 - ii. 35 percent reduction in the California Avenue area
 - iii. 30 percent reduction in the Stanford Research Park
 - iv. 30 percent reduction in the El Camino Real corridor
 - v. 20 percent reduction in other areas of the city.
 - TDM Plans must be approved by the City and monitored by the property owner on an annual basis. The TDM Plans must contain enforcement mechanisms or penalties that accrue if targets are not met.
 - Require new development projects to offset remaining peak period motor vehicle trips through one of the following methods:
 - i. By directly contracting with another property owner or organization to reduce trips generated from another site; or
 - ii. By paying an annual fee to the City for use in reducing motor vehicle trips to the extent feasible through the provision of transit services, carpool/rideshare incentives, bicycle lanes, and other similar programs and improvements.
- b) Establish and implement a policy that eliminates ("unbundles") free or subsidized parking in new commercial and residential development (i.e., requiring employees and residents to pay separately for parking).
- c) Work to advance plans for grade separation at intersections along the Caltrain tracks to reduce traffic congestion/delay and improve safety; seek funding for design and implementation from local, regional, state, and federal sources. Ensure that future grade separation projects include a community participation and review process, and undergo environmental review. Future grade separation

improvement projects would have the potential to cause environmental impacts, such as impacts associated with construction-related emissions, noise, and traffic, and aesthetics and land use impacts. These impacts, and alternatives to these grade separation projects, would be evaluated in detail when the projects are more clearly defined.

- d) Take a leadership role in regional transportation planning and advocating for specific transit improvements and investments, such as Caltrain service enhancements, Dumbarton Express service, enhanced bus service on El Camino Real with queue jumping and curbside platforms, and additional VTA bus service.
- e) Work with the Palo Alto Unified School District (PAUSD) to ensure that decisions regarding school assignments are analyzed to reduce peak period motor vehicle trips to and from school sites.

Mitigation for Impacted Freeway Segments

Measures a, b, and d above would also serve to reduce impacts on freeway segments. TDM Plans for worksites may include measures such as private bus service and free shuttle services to transit stations geared towards commuters.

Mitigation for Impacts on Transit Due to Increased Congestion

All of the mitigation measures proposed for the impacted intersections would also reduce the impact on transit, by reducing traffic congestion. In addition, signal prioritization for buses, focusing first on regional transit routes, would also help mitigate this impact. Queue jump lanes and curbside platforms for buses on El Camino Real (included in Scenario 4, but not Scenarios 1, 2, and 3) would also reduce the effect of congestion on VTA routes in that corridor.

Mitigation for Impacts on Local Residential Streets

Develop a proactive neighborhood traffic calming program with a tool box of specific improvements that can be used to discourage non-local drivers from using local neighborhood streets to bypass traffic congestion on arterials.

1.

Introduction

This report presents a Transportation Impact Analysis (TIA) of the City of Palo Alto Comprehensive Plan Update and the four hypothetical planning scenarios that were developed in order to capture the range of possible outcomes to the Comprehensive Plan Update planning process. This TIA is intended to inform decision-makers about the potential transportation impacts of the policy choices inherent in the four scenarios. The results of this TIA will be incorporated into an Environmental Impact Report (EIR) for the Comprehensive Plan Update. As explained in the EIR, the proposed “project”, for purposes of this TIA, is the adoption and implementation of an updated Comprehensive Plan, along with associated amendments to the City of Palo Alto Zoning Code.

The primary purpose of this report is to assess the impacts of growth during the life of the Comprehensive Plan Update by comparing and contrasting the different transportation-related outcomes that would occur under each of the four hypothetical planning scenarios. Each of the scenarios makes different land use assumptions regarding household growth and job growth. All of the scenarios assume that the network enhancements from the City's *Bicycle + Pedestrian Transportation Plan* (2012) will be implemented. These include adding 7.06 miles to the City's Class I multi-use paths, 18.77 miles to the existing network of Class II bike lanes and enhanced bikeways, 9.15 miles to the City's Class III bike routes on shared roadways, and 18.2 miles of additional Bicycle Boulevards. Each scenario also includes an increase in the number of trains serving Palo Alto in accordance with the Caltrain Modernization/Electrification Project. Aside from these common elements, the scenarios include different assumptions regarding other transportation investments and policies. The horizon year for all scenarios is 2030.

Some of the key differences in transportation investments and land use assumptions among the four scenarios may be summarized as follows:

- Scenario 1:** The Business As Usual scenario assumes the continuation of existing plans, with regard to both land use and transportation. Only currently funded transportation infrastructure projects and network changes are included.
- Scenario 2:** Assumes that the improvements proposed by Santa Clara County in the *2040 County Expressway Plan* will be constructed on Page Mill Road and Foothill Expressway. Assumes the same number of new housing units and new population as Scenario 1, but the lowest number of new jobs of the four scenarios.
- Scenario 3:** Assumes that the Caltrain tracks will be trenched under Meadow Drive and Charleston Road. Assumes more new housing units and population than Scenarios 1 and 2, but less than Scenario 4. Assumes fewer new jobs than Scenario 1, but more than Scenario 2.
- Scenario 4:** Assumes that Bus Rapid Transit (BRT) will be implemented on El Camino Real, with queue-jumping lanes and signal prioritization at intersections, but not a dedicated lane for buses. Also assumes that other measures, such as free transit passes for Palo Alto residents in transit-

accessible areas and parking charges in the Downtown and California Avenue areas, will be implemented to maximize the use of transit. Like Scenario 3, assumes that the Caltrain tracks will be trenched under Meadow Drive and Charleston Road. Assumes the greatest number of new housing units and new population of the four scenarios, and the same number of new jobs as Scenario 1.

The number of new housing units, new population, and new jobs assumed under each of the four scenarios are presented in Table 1 for both the City of Palo Alto and the City plus its Sphere of Influence (SOI). The area of Palo Alto's sphere of influence extends beyond the city limits and includes nearby unincorporated areas, including much of the land owned by Stanford University. For more details regarding the differences among the four scenarios, please refer to the Project Description chapter of the EIR.

Table 1
Summary of Buildout Projections

Land Use Assumption	2030			
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
<u>City of Palo Alto</u>				
New Housing Units	2,720	2,720	3,545	4,420
New Population ^a	6,600	6,600	8,435	10,455
New Jobs	15,480	9,850	12,755	15,480
<u>City of Palo Alto and its Sphere of Influence (SOI)</u>				
New Housing Units	3,880	3,880	4,710	5,580
New Population ^a	9,915	9,915	11,750	13,770
New Jobs	15,870	10,240	13,145	15,870
(a) Population is calculated based on a housing unit vacancy rate of 5 percent and an average household size of 2.40 persons per household in 2014 and 2.41 persons per household in 2030 in both the city limit and SOI. Chapter 3, Project Description, of the Draft EIR assumes an average household size of 2.40 persons per household in 2014 and 2.41 persons per household in 2030 within the city limit and an average household size of 2.0 in 2014 and 2030 within the SOI. This difference in the Project Description better reflects household characteristics and does not affect the findings in the TIA.				

Source: PlaceWorks and City of Palo Alto, 2015.

Palo Alto Travel Demand Forecasting Model

The four scenarios have been compared using the Palo Alto 2030 travel demand forecasting model, which is based on VTA's countywide travel demand forecasting model. VTA's model, in turn, is based on the Metropolitan Transportation Commission's (MTC's) regional model for the entire Bay Area. Land use assumptions for the zones outside of Palo Alto are based on ABAG 2030 land use data, in this case Projections 2013. The model includes a certain number of households and jobs for every TAZ (traffic analysis zone) in every city for 2013 and for 2030. VTA gives every city the opportunity to update/revise the land use assumptions used in the ABAG/MTC model.

Palo Alto's citywide model calculates output variables (such as transit boardings, Average Daily Traffic (ADT), and peak hour traffic volumes) projected to occur in the year 2030 based on the different input assumptions related to each of the four scenarios. Palo Alto's citywide model, like the VTA and MTC models, is a traditional four-step model that includes trip generation, trip distribution, mode choice, and transit and highway assignment.

The trip generation step is based on the model's land use assumptions, which are consistent with those in the VTA model, except that the growth in population, households, and employment within Palo Alto for each of the four scenarios was specified in accordance with each scenario's different assumptions for those variables. The mode choice step distributes all the person trips to different travel modes, including Drive-Alone Auto, Shared-Ride Auto, Transit, Bicycle, and Walk. Mode choice is based on such variables as travel times, trip purpose, trip distance, auto ownership, the cost of using transit versus auto, household income, proximity to transit, employment density, and residential development density. Most of the new population and household growth under all four scenarios is high-density multi-family housing in or near transit corridors (e.g., El Camino Real). The model does not assign all trips made by transit-oriented development (TOD) residents onto the transit mode, but it does assign a higher percentage of those trips to transit than those made by residents who live in low-density housing far from a transit stop.

The transit assignment step results in boardings on different transit services. The highway trip assignment step results in traffic volumes on each roadway link within the model. These volumes are then later used as inputs to calculate the level of service at the study intersections, on the study roadway segments, and on freeway segments and ramps under each of the four scenarios.

The model was calibrated to 2013 conditions, based on 2013 traffic counts, and the 2030 volumes were calculated as an increment of growth over 2013 volumes in order to provide a consistent means of comparison for the four scenarios.

Guidelines and Metrics Used in this TIA

This TIA has been prepared in accordance with the standards and methodologies set forth by the City of Palo Alto, by the Santa Clara Valley Transportation Authority (VTA) Congestion Management Program's *Transportation Impact Guidelines* (October 2014), and by the California Environmental Quality Act (CEQA). The VTA administers the Congestion Management Program (CMP) for Santa Clara County. For detailed information about the regulatory framework that would apply to this Comprehensive Plan Update, please refer to the Transportation and Traffic Existing Conditions Report.

Based on guidance from the City, VTA, and CEQA, the preparation of Transportation Impact Analyses in the past has relied to a great extent on evaluation of Level of Service (LOS) at intersections and on freeways to determine whether a proposed project would have any significant traffic impacts. However, recent trends in the transportation planning field have expanded the range of metrics to be evaluated beyond Level of Service, in order to better capture the potential impacts of a project on other modes of transportation and on the greenhouse gases associated with vehicular travel.

To further the state's commitment to the climate change goals of recent legislation (Senate Bill 375, Assembly Bill 32, and Assembly Bill 1358), Governor Brown signed Senate Bill 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, Division 6, Chapter 3, Sections 15000-15387) 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 study intersections in the City of Palo Alto, the City of Menlo Park, the City of Mountain View, and VTA's CMP still remain applicable to the proposed scenarios. It is anticipated that local agencies will revisit the adopted significance criteria once new CEQA guidelines are adopted by the State.

Another example of the recent trend to expand the range of metrics beyond motor vehicle Level of Service is included in VTA's 2014 revision to the *TIA Guidelines*, which increased the focus on evaluating a project's impacts on pedestrian, bicycle, and transit facilities. VTA is continuing to review and update evaluation methods for those modes.

Thus, this TIA looks at a broad suite of metrics to evaluate potential project impacts, in order to be in step with evolving trends in the transportation planning field, as well as to comply with existing guidelines and legal requirements regarding TIA preparation.

The metrics used to conduct the comparison among scenarios are the same as those used to describe the current conditions in the Transportation and Traffic Existing Conditions Report, prepared earlier in the Comprehensive Plan Update process. These metrics include mode split, transit ridership, Average Daily Traffic (ADT) and motor vehicle Level of Service (LOS) on roadway segments, vehicle miles traveled (VMT), and motor vehicle LOS at key intersections, freeway segments, and freeway ramps. In addition, the analysis discusses travel time on several routes, evaluates a Multi-Modal Level of Service on two roadway segments, and includes an assessment of transit operations, the potential for through traffic to use local residential streets, and safety.

Each of the four scenarios in this TIA makes different assumptions about the growth in households and jobs due to new development and the changes to the City's transportation infrastructure by the year 2030. The growth in households and jobs would be the result of new development projects, which would generate site-specific construction-related traffic during the time period that each project is under construction. Changes to the City's transportation infrastructure would also generate construction-related traffic. All construction-related traffic impacts would be temporary, even if significant, and are therefore not included in the forecasting model assumptions for the year 2030. In some cases, such as building a trench for Caltrain, the construction-related traffic impacts would likely be substantial, but would be addressed through project-specific review and mitigation, not as part of the Comprehensive Plan Update. The City, VTA, and CEQA require major projects to address construction traffic impacts prior to approval.

In addition to serving as a decision-making tool for comparing and contrasting the four scenarios, this report also identifies any significant impacts under any of the scenarios, in accordance with current CEQA guidelines and as input to the EIR being prepared for the Comprehensive Plan Update. Based on the City of Palo Alto's policies, VTA's policies, and CEQA guidelines, a project may be said to result in a significant transportation impact if it:

- Causes an intersection to drop below its motor vehicle level of service standard, or if it is already operating at a substandard motor vehicle level of service, deteriorate by more than a specified amount. The precise definitions of significant impact thresholds at local and Congestion Management Program (CMP) intersections are provided in Chapter 6.
- Causes a freeway segment or ramp to operate at LOS F or contribute traffic in excess of 1% of segment capacity to a freeway segment or ramp already operating at LOS F.
- Impedes the development or function of planned pedestrian or bicycle facilities.
- Increases demand for pedestrian and bicycle facilities that cannot be met by existing or planned facilities.
- Impedes the operation of a transit system as a result of congestion.

- Creates demand for transit services that cannot be met by current or planned services.
- Creates the potential demand for through traffic to use local residential streets.
- Creates an operational safety hazard.
- Results in inadequate emergency access.

Each of these potential impacts will be addressed in the section related to its respective travel mode or topic area. The four planning scenarios will be compared to Existing Conditions in order to determine if a significant impact under CEQA would occur. Impacts associated with Scenario 1, the Business as Usual scenario, would occur if the Comprehensive Plan were not updated and no additional investments (beyond currently funded projects) were made to the transportation network.

For each topic or metric examined, the report will state whether it relates to one of the potential impacts currently defined by CEQA or not. Those that do not (e.g., Mode Share, Average Daily Traffic, Vehicle Miles Travelled) are presented for informational purposes to better understand the transportation-related outcomes associated with the four scenarios.

2. Mode Share

Mode share refers to the percentage of trips made by each of the primary modes of transportation: Driving Alone, Shared Ride, Taking Transit, Bicycling, and Walking. The 2030 travel demand forecasting model calculates the mode split based on input factors taken from survey data or other sources that have been validated. 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. By analyzing the mode split under each of the four scenarios, one can see to what extent each of the scenarios results in increased usage of Ridesharing, Transit, Biking, and Walking.

Table 2 presents the total number of daily person-trips made in Palo Alto under existing conditions and under each of the four scenarios. The table includes all trips beginning and/or ending in Palo Alto, i.e., trips that begin and end in Palo Alto, trips that begin in Palo Alto and end in another jurisdiction, and trips that begin in another jurisdiction and end in Palo Alto.

Both the “Drive Alone” and “Shared Ride” modes are made by automobile. The shared ride mode includes all person-trips with more than one occupant in the vehicle. For example, both a parent with a child in the car and two employees who carpool to work together will be shown in the table as two person-trips made by ridesharing. (Recent years have seen the growth of services such as Uber, Lyft, and other alternative taxicab services which are referred to as Transportation Networking Companies (TNCs) by the California Public Utilities Commission. The model treats TNC trips as single-occupant trips.)

Table 2
Mode Share for Palo Alto Daily Person Trips

Mode	Existing		2030							
	Sum	% Share	Scenario 1		Scenario 2		Scenario 3		Scenario 4	
	Sum	% Share	Sum	% Share	Sum	% Share	Sum	% Share	Sum	% Share
Drive Alone	353,779	61.5%	391,591	59.9%	380,518	60.0%	387,366	59.7%	390,389	58.5%
Shared Ride	130,651	22.7%	145,087	22.2%	141,393	22.3%	143,894	22.2%	145,901	21.9%
Transit	29,494	5.1%	44,503	6.8%	41,659	6.6%	43,820	6.8%	51,975	7.8%
Bike	15,875	2.8%	20,177	3.1%	19,553	3.1%	20,316	3.1%	21,406	3.2%
Walk	45,470	7.9%	52,655	8.1%	51,317	8.1%	53,143	8.2%	57,303	8.6%
TOTAL	575,269	100.0%	654,012	100.0%	634,440	100.0%	648,538	100.0%	666,974	100.0%

Source: Hexagon Transportation Consultants, Inc., October 2015.

The table indicates that all four scenarios are projected to result in a lower mode share for both of the Automobile modes (Drive Alone and Ridesharing) in comparison to Existing Conditions. Under Existing Conditions, the alternative modes of travel (Transit, Bikes, and Walking) account for 15.8% of person-trips. Scenarios 1 and 2 would result in the least change, with those modes totaling 18.0% and 17.8% of person-trips in 2030, respectively. The slightly lower mode share for transit in Scenario 2, compared with Scenario 1, is due to the fact that Scenario

2 includes fewer new jobs, and transit generally has a higher mode share for work trips than for other trip purposes. The ridesharing mode for Scenarios 1 and 2 follows the same pattern as the drive alone mode, in that as more people take transit, ride bikes, or walk, fewer people use cars -- whether as single-occupant or multiple-occupant vehicles.

Scenario 4 would result in the greatest increase in the non-auto modes, with a total of 19.6% of travelers choosing to use transit, ride a bike, or walk. The significant increase in transit's mode share under Scenario 4 is consistent with that scenario's pro-transit policies, such as implementing queue jump lanes for buses on El Camino Real, providing free transit passes to Palo Alto residents who live near transit, and charging for parking in the Downtown and California Avenue business districts.

Each of the scenarios would result in about 3% of all trips being made by bicycle. This represents an increase in bicycling compared to existing conditions. The increase would be due to increased development density and implementation of the *Bicycle and Pedestrian Transportation Plan*, both of which would make bicycling a more attractive travel option. The goals of the *Bicycle and Pedestrian Transportation Plan* are to increase bicycling mode share to 15% of local work trips and 5% of total work trips. It is important to note that these are goals and were not assumed in the travel demand model. Also, the 3% citywide mode share calculated by the model is for all trip purposes, not just work trips.

All scenarios would see increases in the total number of trips by each mode over existing conditions. Of the four future scenarios, Scenario 2 results in the lowest number of total daily trips, which is consistent with the fact that it includes the lowest projections of new housing units and new jobs. Scenario 4 results in the greatest number of total daily person trips, which is consistent with the fact that it includes the greatest combined number of new housing units and new jobs.

The combined auto mode share (drive alone and shared ride) under Scenarios 1 and 4 are 82.1% and 80.4%, respectively. The total number of auto trips (drive alone and shared ride) under Scenarios 1 and 4 are 536,678 and 536,290, respectively. Thus, even though the two auto modes have a declining mode share under Scenario 4 (compared with Scenario 1), the total number of auto trips remains nearly the same as under the Business As Usual scenario, due to the additional housing units and population in Scenario 4.

3.

Bicycle and Pedestrian Usage and Impacts

The Palo Alto travel demand forecasting model estimates that the existing mode share for bicycling is 2.8%, as shown in Table 2 in the preceding chapter. To provide context for that estimate, a typical Bay Area city currently has a 1 to 2% bike mode share in the Metropolitan Transportation Commission (MTC)'s regional model, so 2.8% is double the bike share in most other cities in the region. Both the Palo Alto model and the regional model include both home-based trips (trips that begin or end at the traveler's home) and non-home-based trips, and they both include all common trip purposes, including work, school, shopping, and social/recreational trips. At the state level, Caltrans has recently adopted goals to double the mode share for walking and triple the mode share for bicycling statewide.¹

Because the census data for Palo Alto shows a bike mode share of 8.6% as the means of transportation to work, it is important to understand the differences between these two data sources. Census data for Palo Alto reports the mode choice of Palo Alto residents, and only for their journey to work. The travel demand forecasting model includes all trips to, from, and within Palo Alto, regardless of the traveler's residence and regardless of trip purpose. Because of the jobs – housing imbalance in Palo Alto, many commute trips are made into and out of the city every day by non-Palo Alto residents, and very few of those trips are made by bicycle. In addition to those journey-to-work trips, Palo Alto is a destination for non-Palo Alto residents for many other trip purposes (e.g., shopping at Stanford Shopping Center, restaurants downtown, etc.) and relatively few of those trips will be made by bicycling, simply because they are longer than most trips that are entirely within Palo Alto. In short, it is primarily the relatively longer distance trips into and out of Palo Alto by non-residents that likely account for the 2.8% bike mode share estimated by the model.

All four 2030 scenarios assume that Palo Alto's adopted *Bicycle + Pedestrian Transportation Plan* will be implemented. The increase in mode share for bicycling from 2.8% under Existing Conditions to 3.1% or 3.2% under all four future scenarios, is primarily the result of the improvement in bicycle facilities resulting from implementation of that plan. In addition, since virtually all the new housing units in all four scenarios are assumed to be multi-family housing located in mixed use corridors, the resulting increase in development density also serves to increase the proportion of people choosing to bike to some nearby destinations.

Similarly, the increase in mode share for walking, from 7.9% under Existing Conditions to 8.1 % or 8.2% under Scenarios 1, 2, and 3, is also attributable to improved pedestrian facilities resulting from implementing the *Bicycle + Pedestrian Transportation Plan*. The substantial increase to 8.6% in the walking mode share under Scenario 4 is due to the fact that this scenario includes the greatest development density, due to the inclusion of multi-family housing on corridors that include other land uses, so that people may walk to more destinations. The policy of charging for parking in the Downtown and California Avenue areas also increases the attractiveness of walking instead of driving.

¹ Caltrans, *Strategic Management Plan 2015 – 2020*, March 2015. Page 11.

Potential Impacts Related to Bicycles and Pedestrians

The CEQA guidelines include two potential impacts related to walking and biking:

- Would the project impede the development or function of planned pedestrian or bicycle facilities?
- Would the project increase demand for pedestrian and bicycle facilities that cannot be met by existing or planned facilities?

None of the four scenarios would impede the development or function of planned pedestrian or bicycle facilities. In fact, all four scenarios assume the implementation of all improvements included in the City's *Bicycle + Pedestrian Transportation Plan*. The Comprehensive Plan Update includes a policy to bring all signalized intersections up to current pedestrian design standards. This includes the installation of count-down pedestrian signal heads. In this fashion, the Plan would have a beneficial impact on pedestrian circulation.

All four scenarios would increase demand for pedestrian and bicycle facilities in that they each assume (to varying degrees) an increase in population and employment, and any increase in population and employment would also increase the number of bicyclists and pedestrians in the City. Scenarios 2, 3, and 4 also include specific improvements or other policies that would increase demand for pedestrian and bicycle facilities, beyond the level that would occur under the Business as Usual scenario. None of the scenarios would create more demand than could be met by existing or planned facilities. The specific assumptions of each scenario that would increase demand for pedestrian and bicycle facilities are as follows:

- **Expressway Improvements:** The expressway improvements included in Scenario 2 include enhancements to the bicycle and pedestrian facilities on Page Mill Road and on Foothill Expressway. For example, on Page Mill Road between Foothill Expressway and I-280, a new Class I bike and pedestrian trail would be provided on one side, in addition to adding another travel lane in each direction to the roadway. Although the addition of travel lanes generally degrades the pedestrian environment, at this specific location where there are currently no pedestrian facilities at all between Deer Creek Road and I-280, the addition of a new Class I bike and pedestrian trail would result, on balance, in an improved pedestrian environment.
- **Caltrain Trench:** The trench for the Caltrain tracks at the Meadow Drive and Charleston Road crossings, included in both Scenarios 3 and 4, would improve the bicycle and pedestrian crossings significantly at these locations.
- **Employer Incentives for bicycling:** This measure is included in Scenarios 2, 3, and 4.
- **Unbundled parking costs for multi-family housing units.** This measure, which is included in Scenarios 3 and 4, has the effect of increasing the cost of auto ownership (as compared to not owning a car) and making alternative modes relatively more attractive.
- **Exploration of the option of putting in place a parking charge program for existing businesses with more than 50 employees..** For employees who live within reasonable walking or biking distance of their workplace, paying for parking at their workplace, included in Scenario 4, make walking or biking to work more attractive, by increasing the relative cost of driving.
- **Paid parking in Downtown and California Avenue business districts.** By increasing the total cost of driving to the Downtown or California Avenue business districts, this Scenario 4 measure would also make walking or biking more attractive.

All of these measures would increase the number of trips made by walking and biking, but they would not increase demand beyond the capacity of the planned pedestrian and bicycle facilities. In fact, two of the measures (expressway improvements and Caltrain trench) would increase the capacity and connectivity of the City's pedestrian and bicycle facilities. Under all scenarios, the City would continue to implement its adopted *Bicycle + Pedestrian Transportation Plan*. In addition, under Scenarios 2, 3, and 4 new bicycle and pedestrian improvements would be guided by concept area plans in the California Avenue area.

Even though the demand for bicycle and pedestrian facilities would not exceed their capacity, and thus there would not be a significant impact under CEQA, the community is likely to want to increase the capacity of its bicycle facilities even further (i.e., beyond the level envisioned in the current *Bicycle + Pedestrian Transportation Plan*), as cycling increases in both absolute numbers and mode share. In addition, bicycle and pedestrian facilities will continue to be upgraded to current accessibility and design standards, in accordance with policies in the *Bicycle + Pedestrian Transportation Plan* and this Comprehensive Plan Update.

4. Transit Ridership and Impacts

The Palo Alto travel demand forecasting model estimates that 29,494 person trips per day were made by transit in 2013 (Existing Conditions), as presented in Table 2 in the chapter on Mode Share. Table 3 breaks down that total number of transit trips into the number of boardings made on different transit service providers. For example, if someone boards Caltrain in Palo Alto and then transfers to a Caltrain shuttle in San Mateo to reach their final destination, the table presents that as two boardings for one transit trip. As another example, if someone boards a BART train in Oakland and then transfers to Caltrain in Millbrae and rides to Palo Alto, and then takes a Stanford Marguerite shuttle to the Stanford campus, all three boardings of that transit trip are shown in the table. The primary reason why it is important to consider boardings by transit operator in addition to the total number of daily transit trips is to highlight which services would receive the greatest increases in ridership in the future.

Table 3 presents the number of boardings and the number of transit trips for each of the four Comprehensive Plan scenarios. Like the mode share data, Table 3 includes all transit trips that begin and/or end in Palo Alto, i.e., trips entirely within Palo Alto, trips that begin in Palo Alto and end in another jurisdiction, and trips that begin in another jurisdiction and end in Palo Alto. Note that changes in Palo Alto under each of the future scenarios have very little influence on transit providers that are farther away, such as the Muni system in San Francisco.

Table 3
Existing and 2030 Daily Transit Boardings – Trips To, From, and Within Palo Alto

Transit Service	Existing	2030			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
CalTrain	13,883	23,930	21,947	23,571	25,269
VTA Bus	8,177	8,739	8,473	8,719	11,328
VTA LRT	762	1,445	1,361	1,421	1,582
SamTrans	2,636	3,130	2,934	3,115	3,918
Stanford Shuttles	6,197	8,913	8,041	8,496	10,640
CalTrain Shuttles	4,376	6,971	6,472	6,886	7,178
Palo Alto Shuttles	2,114	3,424	2,849	3,397	4,179
BART, Muni and Other	5,908	5,625	5,210	5,408	5,951
Total	44,053	62,177	57,287	61,013	70,045
Transit Trips	29,494	44,503	41,659	43,820	51,975
Boardings/Trip	1.49	1.40	1.38	1.39	1.35

Source: Hexagon Transportation Consultants, Inc., October 2015.

The future transit services assumed by the Palo Alto travel demand forecasting model and the scenarios in this TIA are based on and consistent with VTA's countywide forecasting model and MTC's regional forecasting model. The VTA model assumes that the only difference between the existing and 2030 capacity of Palo Alto's transit services would be the El Camino Bus Rapid Transit (BRT) and Caltrain electrification projects.

The following two improvements are included in the model's 2030 transit assumptions:

- The increased Caltrain service level included in the *Peninsula Corridor Electrification Project Environmental Impact Report* (February 2014). This includes shorter headways and increased travel speeds in 2030, as well as electrification of the trains. All four scenarios in this TIA include the same assumption regarding future Caltrain service levels.²
- Implementation of Bus Rapid Transit (BRT) on El Camino Real within the existing six mixed-flow lanes, with 14 curbside bulbout stations along the 17.6 mile El Camino corridor between the Palo Alto Transit Center and downtown San Jose, and bus signal priority at all signalized intersections that don't currently have it. Scenarios 1, 2, and 3 include this assumption regarding BRT, which corresponds to Alternative 2 in VTA's *El Camino Real Bus Rapid Transit Project Environmental Impact Report/Environment Assessment* (August 2014). Scenario 4 includes a different assumption as described below.³

Scenario 4 was designed to be the most "pro-transit" of the four planning scenarios. Accordingly, it includes several specific assumptions that are different from the other three scenarios, as follows:

- Bus Rapid Transit (BRT). Scenario 4 assumes the improvements included in Scenarios 1, 2, and 3, plus a short dedicated lane for transit in Santa Clara and bus queue jump lanes at intersections in Palo Alto, where possible. Scenario 4 corresponds to Alternative 3b in VTA's BRT EIR, with the addition of queue jump lanes in Palo Alto. The bus queue jump lanes would be created by removing on-street parking and narrowing the existing mixed-flow traffic lanes close to the intersection, but not eliminating any mixed-flow traffic lanes. The lane would be used by both bicycles and buses. Queue jump lanes allow buses to proceed through congested intersections more quickly than they otherwise would.
- Free transit passes for all Palo Alto residents in transit-accessible areas. This Scenario 4 measure would clearly generate greater transit demand. However, partly because household income is so high in Palo Alto, many residents are more sensitive to travel time than to the cost differential between using transit and other modes of travel.
- Exploration of the option of putting in place a parking charge program for existing businesses with more than 50 employees. Any parking charges implemented would make transit more attractive by increasing the relative cost of driving.
- Paid parking in Downtown and California Avenue business districts. By increasing the total cost of driving to the Downtown or California Avenue business districts, this Scenario 4 measure would make transit more attractive, especially in combination with free transit passes.
- Unbundled parking costs for multi-family housing units. This measure, which is included in both Scenarios 3 and 4, would have the effect of increasing the cost of auto ownership (as compared to not owning a car) and making alternative modes relatively more attractive.

² The projected 2030 Caltrain boardings presented in Table 3 are not directly comparable to the ridership estimates in the *Peninsula Corridor Electrification Project Environmental Impact Report*, which presents only boardings that occur at each station (i.e., trips originating from the Palo Alto and California Avenue stations), but not boardings that occur at other stations for trips to Palo Alto. Also, whereas the Palo Alto Comprehensive Plan Update and this TIA focus on the year 2030 for the future scenarios, the Caltrain Electrification EIR focuses on the years 2020 and 2040. However, the general Caltrain ridership trend presented in Table 3 is consistent with the trend presented in the Caltrain Electrification EIR.

³ The projected VTA bus boardings presented in Table 3 are not comparable to the ridership figures in VTA's *El Camino Real Bus Rapid Transit Project Environmental Impact Report/Environment Assessment* (August 2014) for a number of reasons. That EIR presents ridership data for Routes 22 and 522 only (not all of the VTA routes serving Palo Alto) for the entire BRT corridor (not for specific cities) in 2040 (not 2030). Further, the BRT definition included in Scenario 4 does not correspond precisely to any of the alternatives studied in the *BRT EIR*, as explained in the first bullet point under "Scenario 4."

Table 3 shows that Scenario 1, the Business As Usual scenario, results in 62,177 transit boardings in the year 2030, which is 18,124 more boardings than the existing level, a 41% increase. Most of the new boardings are on Caltrain and the Caltrain shuttles, which is a reflection of increased Caltrain service in 2030, plus the travel time advantage that Caltrain would provide, as compared with driving, as road congestion increases. With Caltrain's electrification project, there would be more trains scheduled, so wait times for passengers would decrease, reducing their total travel time.

While it is not possible to separate out the influence of each transit priority policy, the results indicate that Scenario 4, which includes the greatest number of policies and actions to increase transit ridership, results in 70,045 total boardings, which is 25,992 more than existing conditions (a 59% increase) and 7,868 more than the Business As Usual scenario (a 13% increase). Under Scenario 4, VTA bus ridership would be substantially higher than under the other three scenarios, due to the combination of the BRT project and other pro-transit policies. Compared with the Business As Usual scenario, Scenario 4 would result in an additional 2,589 VTA bus boardings per day.

The total number of transit trips increases by 15,009 (51%) under Scenario 1 and 22,636 (77%) under Scenario 4, compared with Existing Conditions. The increase in transit trips under Scenario 4 is due to the specific pro-transit measures included in that scenario and the fact that it includes the highest combined number of new housing units and new jobs. Scenario 2 results in the fewest boardings and transit trips of the four scenarios, which is consistent with its assumption of the lowest combined number of new housing units and new jobs.

The decrease in the number of boardings per transit trip for all the scenarios, compared with Existing Conditions, indicates that there are projected to be more transit trips in the future that would be made with a single boarding, i.e., fewer transfers would be made. This metric suggests a slightly greater level of convenience in using transit in 2030, since transfers add to a passenger's total travel time and frequently reduce the reliability of the transit option.

Potential Impacts Related to Transit Services

The CEQA guidelines include two potential impacts related to transit:

- Would the project impede the operation of a transit system as a result of congestion?
- Would the project create demand for transit services that cannot be met by current or planned services?

The first question can only be answered after the level of congestion associated with each of the four scenarios has been analyzed, so it will be addressed later in Chapter 8 of this TIA.

All four scenarios would increase demand for transit services, since all four scenarios include, to varying degrees, increased population and increased employment in 2030, compared with existing conditions in 2013. In addition, as discussed above, Scenarios 3 and 4 include a policy of unbundled parking costs for multi-family housing, which would make transit more attractive by increasing the cost of car ownership for those residents who own cars, as compared to those who do not own cars. Scenario 4 includes several additional policies that would increase demand for transit, as noted above.

However, none of the scenarios would increase demand beyond the current or planned capacity of the transit network. Hexagon has not conducted a detailed quantitative analysis of each scenario's demand versus the capacity of each transit service, but local knowledge suggests that the only service that is likely to approach full capacity is Caltrain. The EIR for the Caltrain electrification project, which projects increased ridership consistent with the 2030 forecasts herein, includes a detailed capacity analysis for the ridership estimated for 2040. That EIR concludes that all peak period trains would operate at 97% of capacity in 2040, but that demand would not exceed capacity.

5.

Traffic Conditions on Selected Roadway Segments

This chapter presents Average Daily Traffic (ADT) and Level of Service (LOS) on selected roadway segments in Palo Alto and neighboring jurisdictions. In addition, Vehicle Miles Traveled (VMT) and VMT Per Capita are presented for the entire City of Palo Alto and for the City and its Sphere of Influence.

As discussed in Chapter 1, upcoming changes to the CEQA Guidelines are expected to include VMT as a basis for findings of significant impact in the future. The Governor's Office of Planning and Research (OPR) has released a *Draft of Updates to the CEQA Guidelines* that proposes VMT and/or VMT Per Capita as the replacement metric for Motor Vehicle Level of Service in the context of CEQA. Thus, the examination of VMT and VMT Per Capita is consistent with the anticipated changes to the CEQA Guidelines.

Study Roadway Segments

Traffic conditions were analyzed under the four planning scenarios for the same roadway segments that were studied in the Existing Conditions report. As in the Existing Conditions report, the following segments are evaluated in terms of ADT and Level of Service.

1. Sand Hill Road between I-280 and El Camino Real (SR 82)
2. El Camino Real (SR 82) between Sand Hill Road and Page Mill Road (CMP)
3. El Camino Real (SR 82) between Page Mill Road and San Antonio Road (CMP)
4. Page Mill Road between I-280 and El Camino Real (SR 82) (CMP)
5. Arastradero Road between I-280 and El Camino Real (SR 82)
6. Alma Street between University Avenue and San Antonio Road
7. Middlefield Road between University Avenue and San Antonio Road
8. University Avenue between El Camino Real (SR 82) and US 101
9. Embarcadero Road between El Camino Real (SR 82) and US 101
10. Oregon Expressway between El Camino Real (SR 82) and US 101 (CMP)
11. Charleston Road between El Camino Real (SR 82) and San Antonio Road
12. San Antonio Road between El Camino Real (SR 82) and US 101 (CMP)
13. Foothill Expressway/Junipero Serra Blvd between Sand Hill Road and Arastradero Road (CMP)

Six of the study roadway segments are part of the VTA Congestion Management Program (CMP) system roadway network, as indicated above. The locations on each segment where tubes were placed to collect traffic counts under Existing Conditions are shown on Figure 1.

Figure 1
Roadway Segments and Intersections for Evaluation

Average Daily Traffic and Segment Levels of Service

Average Daily Traffic (ADT) is the number of vehicles travelling along a street segment in both directions during a 24-hour period on an average weekday. ADT and roadway segment Level of Service (LOS) provide a rough guide to the overall capacity and operations of the road system throughout the city.

The ADT counts for Existing Conditions are based on 24-hour tube counts collected on each roadway segment on a typical weekday, as presented in the Existing Conditions Report prepared in August 2014,. The table also presents ADT, as calculated by the 2030 travel demand forecasting model, and the level of service for each roadway segment under each of the four Comprehensive Plan scenarios.

The level of service (LOS) for each segment is determined by comparing the traffic volume on the roadway to its capacity, as determined by the type of roadway and the number of lanes available for vehicular traffic. The capacities used in this analysis are based on the *2000 Highway Capacity Manual* (HCM) calculations and are consistent with local policies in Palo Alto and throughout Santa Clara County. It should be noted that the roadway segment LOS is based on daily volumes and provides a general representation of traffic operations on the specified segment. Intersection levels of service during peak hours, which present a more detailed picture of traffic operations, are analyzed in Chapter 6. Table 4 presents the roadway segment Level of Service definitions for motor vehicles based on Volume-to-Capacity ratios.

Table 4
Motor Vehicle Level of Service Definitions for Roadway Segments

Level of Service	Description	Volume-to-Capacity Ratio
A	LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream.	$0 \leq V/C < 0.3$
B	LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted.	$0.3 \leq V/C < 0.5$
C	LOS C describes stable operation. The ability to maneuver within the traffic stream is only slightly restricted.	$0.5 \leq V/C < 0.7$
D	LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. LOS D is typical in urban areas.	$0.7 \leq V/C < 0.9$
E	LOS E is characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing. LOS E is typical in urban areas.	$0.9 \leq V/C < 1.0$
F	LOS F is characterized by flow at extremely low speed and is considered unacceptable by most drivers. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing.	$1.0 \leq V/C$

Source: Hexagon Transportation Consultants, Inc., October 2015.

The two roadway segments on El Camino Real, Segments #2 and #3, are under the jurisdiction of Caltrans (see Table 5) because El Camino Real is a state highway (State Route 82). Two segments, Page Mill Road (#4) and Oregon Expressway (#10) are under the jurisdiction of the Santa Clara County Department of Roads and Airports because they are part of the County Expressway system. Segment #13, includes a portion that is named Foothill Expressway and is part of the County Expressway system. At Page Mill Road, this segment changes names to Junipero Serra Boulevard, which is not part of the County Expressway system.

As shown in Table 5, ADT on all roadway segments would be higher in the year 2030 than today under all four of the scenarios. On 11 out of 13 segments, the scenario with the lowest amount of ADT growth compared with Existing Conditions is Scenario 2. This is consistent with the fact that Scenario 2 assumes the lowest growth in housing units and jobs. However, even under Scenario 2, the level of service declines from the existing level of service on 8 out of 13 segments.

When compared with Existing Conditions, none of the scenarios would cause a significant impact on any street segments. The only segment with an LOS of F (University Avenue), is already at LOS F under Existing Conditions. That is, the only segment on which the Average Daily Traffic volume exceeds its capacity is University Avenue.

Scenarios 1 and 4 would have the highest ADT on 11 out of 13 roadway segments, which is consistent with the fact that these scenarios include the highest number of new housing units and new jobs. In general, however, the differences in ADT under the four scenarios are fairly small and do not result in a change in level of service when the four scenarios are compared with each other. The only segment that would experience a different level of service under one of the scenarios (compared with the other scenarios) is Embarcadero Road (Segment 9), which would operate at LOS D under Scenario 2, compared with LOS E under the three other scenarios. This difference is attributable to the lower number of housing units and new jobs under Scenario 2.

Scenario 2 includes an expansion from four to six mixed-flow lanes on Page Mill Road between I-280 and Porter Drive (a portion of segment #4), as proposed in the County of Santa Clara's *Page Mill Road Expressway Corridor Study Report* (June 2015).⁴ Page Mill Road between Porter Drive and El Camino Real (also part of segment #4) would remain four lanes, with several intersection improvements. Because the ADT count was conducted between Hansen Way and Ramos Way, where Page Mill Road would remain at four lanes, Table 5 shows this segment with four lanes and that the level of service would remain at LOS E under Scenario 2.

The level of service on the portion between I-280 and Porter Drive would be expected to improve if the capacity expansion from four to six mixed-flow lanes were built as assumed in Scenario 2. It would also be possible to reserve the additional lanes exclusively for high occupancy vehicles (HOV) during peak periods. Creation of HOV lanes on that portion of Page Mill Road would incentivize transit and carpooling, but somewhat reduce the benefit of the additional lanes in terms of their effect on motor vehicle level of service. The County's *Page Mill Road Expressway Corridor Study Report* also proposes a grade separation at the intersection of Foothill Expressway and Page Mill Road, which is also assumed in Scenario 2. The key to improving the motor vehicle level of service on this segment would be the proposed grade separation of through traffic on Page Mill Road at this intersection, since it is the critical constraint where capacity is less than vehicular volume.

⁴ The *Page Mill Road Expressway Corridor Study Report* gives peak hour volumes on very short portions of Page Mill Road, so the data are not directly comparable to the ADT volume for segment #4. Because the County's 2040 Expressway Plan has not yet been published, no comparison with that data is possible at this time.

Table 5
Average Daily Traffic (ADT) and Roadway Segment Level of Service (LOS)

#	Street	From	To	Jurisdiction	# of Lanes	Capacity	Existing Conditions		Scenario 1		Scenario 2		Scenario 3		Scenario 4	
							Existing ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
1	Sand Hill Road	I-280	El Camino Real	City	4	38,200	29,035	D	37,075	E	37,523	E	37,619	E	37,166	E
2	El Camino Real ¹	Sand Hill Road	Page Mill Road	CalTrans	6	59,300	35,862	C	43,581	D	42,866	D	43,384	D	44,176	D
3	El Camino Real ¹	Page Mill Road	San Antonio Rd	CalTrans	6	59,300	30,443	B	38,209	C	37,415	C	37,972	C	38,347	C
4	Page Mill Road ^{1,3}	I-280	El Camino Real	County	4	39,888	34,204	E	38,995	E	37,656	E	38,477	E	39,372	E
5	Arastradero Rd	I-280	El Camino Real	City	4	38,200	15,144	A	21,605	C	20,852	C	21,200	C	21,022	C
6	Alma Street	University Ave	San Antonio Rd	City	4	38,200	28,475	D	34,596	E	34,222	E	34,535	E	34,415	E
7	Middlefield Road	University Ave	San Antonio Rd	City	2	17,300	12,492	D	13,513	D	12,543	D	12,601	D	13,047	D
8	University Ave ²	El Camino Real	Route 101	City	2	17,300	19,022	F	20,226	F	20,146	F	20,220	F	20,301	F
9	Embarcadero Rd	El Camino Real	Route 101	City	4	38,200	24,859	C	32,646	E	31,984	D	32,794	E	32,862	E
10	Oregon Expwy ¹	El Camino Real	Route 101	County	4	39,888	30,925	D	31,940	D	31,025	D	31,720	D	32,454	D
11	Charleston Road	El Camino Real	San Antonio Rd	City	2	17,300	12,371	D	16,625	E	15,663	E	16,035	E	16,440	E
12	San Antonio Rd ¹	El Camino Real	Route 101	City	4	38,200	35,885	E	37,745	E	37,996	E	37,669	E	37,437	E
13	Foothill Expwy / Junipero Serra ^{1,4}	Sand Hill Road	Arastradero Rd	County/ City	4, 2	23,000	15,580	C	21,592	E	20,928	E	21,213	E	21,489	E
Notes:																
¹ Roadway segments are part of the VTA CMP System Roadway Network																
² Segment LOS bolded in red represents LOS below acceptable standards																
³ According to the "Page Mill Road Expressway Corridor Study Report", Santa Clara Roads and Airports Department, June 2015, the portion of Page Mill Road between I-280 and Porter Drive would be expanded from 4 to 6 lanes. However, the location where the ADT volume was counted (between Hansen Way and Ramos Way) would still have 4 lanes, so the capacity is based on 4 lanes under all 4 scenarios.																
⁴ The portion of this segment east of Page Mill Road is called Foothill Expressway, has 4 lanes, and is a County Expressway. The portion of this segment west of Page Mill Road is called Junipero Serra Boulevard, has 2 lanes, and is not a County Expressway. The location where the ADT volume was counted (on Junipero Serra Blvd, between Stanford Ave and Page Mill Road) has 2 lanes. The capacity has been estimated as 23,000 because of the longer green time for Junipero Serra at signals.																

Source: Hexagon Transportation Consultants, Inc., October 2015.

Vehicle Miles Traveled

For purposes of looking at additional characteristics of trip making, vehicle miles traveled (VMT) by trip orientation and vehicle miles traveled (VMT) per capita were analyzed. VMT is a metric that is used in noise, air quality, and greenhouse gas emissions analyses because it 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. As noted above, VMT has also been proposed as a replacement metric for motor vehicle Level of Service by the Governor's Office of Planning and Research in its *Draft of Updates to the CEQA Guidelines*, prepared pursuant to SB 743. It is anticipated that VMT will become a basis for findings of significant impact under CEQA in the future.

Vehicle miles traveled refers to daily Palo Alto trips multiplied by the trip distances. Palo Alto trips were defined as all trips that begin and/or end in Palo Alto. In Tables 6 and 7, this is referred to as Directional Orientation, as follows:

- Internal-External: trips that begin in Palo Alto and end at a location outside the city;
- External-Internal: trips that begin outside the city and end in Palo Alto;
- Internal-Internal: trips that begin and end entirely within Palo Alto.

All data provided in Tables 6 and 7, including VMT, number of motor vehicle trips, average trip length, and the directional orientation of the trips, were calculated by the 2030 travel demand forecasting model. Average trip length was derived by dividing the total VMT by the total number of motor vehicle trips. We note that the VMT data presented in this TIA differs from the data presented in the Existing Conditions Report; which was corrected after further review. For this TIA, trips with both trip ends in Palo Alto (Internal-Internal) were counted as two trips, while trips with only one trip end in Palo Alto (Internal-External and External-Internal) were counted as one trip. This is standard practice, because, for trips with an origin or destination outside Palo Alto, half of the "responsibility" for the trip lies outside Palo Alto for purposes of air quality and greenhouse gas analyses.⁵ An alternative method for calculating VMT within a City's boundaries is currently being developed by the Office of Planning and Research, as part of SB 743's new focus on VMT as a key metric, but it has not yet been adopted or incorporated into the travel demand forecasting models in use today.

Tables 6 and 7 present the total number of motor vehicle trips, the total daily VMT, and the average trip lengths for non-commercial traffic and for commercial truck traffic separately. The data for commercial truck traffic are reported separately because it is used as an input for air quality analyses. Table 6 presents data for the City of Palo Alto and Table 7 presents data for the City of Palo Alto and its sphere of influence (SOI).

As can be seen in Table 6, under Existing Conditions approximately 19% of all vehicle trips are Internal-Internal trips – that is, they both begin and end in Palo Alto – and under all four scenarios Internal-Internal trips would represent approximately 18% to 19% of all vehicle trips. Since Internal-Internal trips are shorter than most trips coming from or going to locations outside the city, the VMT for Internal-Internal trips is only about 5% to 6% of the total vehicle miles traveled. Conversely, Internal-External and External-Internal trips represent approximately 81% to 82% of the vehicle trips per day, but over 95% of the total VMT, because most of these trips are longer than trips entirely within Palo Alto.

⁵ Recommendations of the Regional Targets Advisory Committee (RTAC) Pursuant to Senate Bill 375: A Report to the California Air Resources Board. September 2009. Accessed online October 21, 2015 at <http://www.arb.ca.gov/cc/sb375/rtac/report/092909/finalreport.pdf>.

Table 6
Daily Vehicle Miles Traveled by Directional Orientation – City of Palo Alto

	2030									
	Existing		Scenario 1		Scenario 2		Scenario 3		Scenario 4	
Total Palo Alto VMT¹	5,320,931	100.0%	5,947,158	100.0%	5,741,373	100.0%	5,853,201	100.0%	5,788,497	100.0%
Internal-External ²	2,410,604	45.3%	2,708,446	45.5%	2,618,931	45.6%	2,668,290	45.6%	2,638,651	45.6%
External-Internal ³	2,600,249	48.9%	2,903,127	48.8%	2,797,144	48.7%	2,851,560	48.7%	2,839,746	49.1%
Internal-Internal ⁴	310,078	5.8%	335,585	5.6%	325,298	5.7%	333,351	5.7%	310,100	5.4%
Total Motor Vehicle Trips¹	432,122	100.0%	479,198	100.0%	467,567	100.0%	475,362	100.0%	463,255	100.0%
Internal-External ²	171,108	39.6%	191,317	39.9%	186,833	40.0%	189,489	39.9%	187,202	40.4%
External-Internal ³	177,227	41.0%	197,070	41.1%	191,907	41.0%	194,718	41.0%	193,740	41.8%
Internal-Internal ⁴	83,786	19.4%	90,811	19.0%	88,827	19.0%	91,156	19.2%	82,313	17.8%
Average Trip Length [Miles]⁵	12.31		12.41		12.28		12.31		12.50	
Internal-External	14.09		14.16		14.02		14.08		14.10	
External-Internal	14.67		14.73		14.58		14.64		14.66	
Internal-Internal	3.70		3.70		3.66		3.66		3.77	
Total Palo Alto Commercial VMT⁶	240,869	100.0%	288,129	100.0%	268,859	100.0%	278,078	100.0%	286,510	100.0%
Internal-External ²	111,444	46.3%	133,641	46.4%	124,865	46.4%	129,092	46.4%	132,907	46.4%
External-Internal ³	126,369	52.5%	151,092	52.4%	140,948	52.4%	145,752	52.4%	150,202	52.4%
Internal-Internal ⁴	3,056	1.3%	3,396	1.2%	3,045	1.1%	3,234	1.2%	3,401	1.2%
Total Commercial Vehicle Trips¹	9,182	100.0%	10,816	100.0%	10,195	100.0%	10,526	100.0%	10,816	100.0%
Internal-External ²	4,222	46.0%	5,015	46.4%	4,743	46.5%	4,890	46.5%	5,015	46.4%
External-Internal ³	4,327	47.1%	5,113	47.3%	4,833	47.4%	4,982	47.3%	5,113	47.3%
Internal-Internal ⁴	634	6.9%	688	6.4%	619	6.1%	654	6.2%	688	6.4%
Average Trip Length [Miles]⁵	26.23		26.64		26.37		26.42		26.49	
Internal-External	26.40		26.65		26.33		26.40		26.50	
External-Internal	29.21		29.55		29.16		29.26		29.38	
Internal-Internal	4.82		4.94		4.92		4.94		4.94	

Numbers may not add up to 100% due to rounding

Footnotes:

¹ Trips with one trip end outside Palo Alto were counted as one trip, whereas trips with both ends in Palo Alto were counted as two trips.

² "Internal-External" refers to VMT generated by vehicle trips that start in Palo Alto and end outside Palo Alto

³ "External-Internal" refers to VMT generated by vehicle trips that start outside Palo Alto and end in Palo Alto

⁴ "Internal-Internal" refers to VMT generated by vehicle trips that start and end in Palo Alto

⁵ Average Trip Length is calculated by dividing the Total VMT by the Total Number of Vehicles.

⁶ Commercial VMT (related to heavy trucks) is not included in "Total Palo Alto VMT" shown in the table.

Source: Hexagon Transportation Consultants, Inc., October 2015.

Table 7
Daily Vehicle Miles Traveled by Directional Orientation – City of Palo Alto and Sphere of Influence

	2030									
	Existing		Scenario 1		Scenario 2		Scenario 3		Scenario 4	
Total Palo Alto+SOI VMT¹	6,391,293	100.0%	7,110,437	100.0%	6,897,508	100.0%	7,000,886	100.0%	6,932,573	100.0%
Internal-External ²	2,828,732	44.3%	3,162,070	44.5%	3,071,606	44.5%	3,117,386	44.5%	3,087,179	44.5%
External-Internal ³	3,132,854	49.0%	3,488,759	49.1%	3,377,815	49.0%	3,426,597	48.9%	3,413,825	49.2%
Internal-Internal ⁴	429,707	6.7%	459,608	6.5%	448,088	6.5%	456,903	6.5%	431,569	6.2%
Total Motor Vehicle Trips¹	499,013	100.0%	549,691	100.0%	538,480	100.0%	545,826	100.0%	533,336	100.0%
Internal-External ²	190,992	38.3%	213,188	38.8%	209,021	38.8%	211,452	38.7%	209,350	39.3%
External-Internal ³	200,982	40.3%	222,636	40.5%	217,782	40.4%	220,289	40.4%	219,275	41.1%
Internal-Internal ⁴	107,039	21.5%	113,867	20.7%	111,677	20.7%	114,085	20.9%	104,711	19.6%
Average Trip Length [Miles]⁵	12.81		12.94		12.81		12.83		13.00	
Internal-External	14.81		14.83		14.70		14.74		14.75	
External-Internal	15.59		15.67		15.51		15.55		15.57	
Internal-Internal	4.01		4.04		4.01		4.00		4.12	
Total Palo Alto+SOI Commercial VMT⁶	258,293	100.0%	306,896	100.0%	287,470	100.0%	296,665	100.0%	305,083	100.0%
Internal-External ²	119,252	46.2%	141,948	46.3%	133,138	46.3%	137,335	46.3%	141,134	46.3%
External-Internal ³	135,372	52.4%	160,941	52.4%	150,709	52.4%	155,496	52.4%	159,936	52.4%
Internal-Internal ⁴	3,670	1.4%	4,007	1.3%	3,623	1.3%	3,834	1.3%	4,013	1.3%
Total Commercial Vehicle Trips¹	9,776	100.0%	11,448	100.0%	10,833	100.0%	11,160	100.0%	11,448	100.0%
Internal-External ²	4,464	45.7%	5,274	46.1%	5,008	46.2%	5,152	46.2%	5,274	46.1%
External-Internal ³	4,572	46.8%	5,382	47.0%	5,107	47.1%	5,252	47.1%	5,382	47.0%
Internal-Internal ⁴	739	7.6%	793	6.9%	718	6.6%	756	6.8%	793	6.9%
Average Trip Length [Miles]⁵	26.42		26.81		26.54		26.58		26.65	
Internal-External	26.71		26.92		26.58		26.66		26.76	
External-Internal	29.61		29.91		29.51		29.60		29.72	
Internal-Internal	4.96		5.05		5.05		5.07		5.06	

Numbers may not add up to 100% due to rounding

Footnotes:

¹ Trips with one trip end outside Palo Alto +SOI were counted as one trip, whereas trips with both ends in Palo Alto+SOI were counted as two trips.

² "Internal-External" refers to VMT generated by vehicle trips that start in Palo Alto+SOI and end outside Palo Alto+SOI

³ "External-Internal" refers to VMT generated by vehicle trips that start outside Palo Alto+SOI and end in Palo Alto+SOI

⁴ "Internal-Internal" refers to VMT generated by vehicle trips that start and end in Palo Alto+SOI

⁵ Average Trip Length is calculated by dividing the Total VMT by the Total Number of Vehicles.

⁶ Commercial VMT (related to heavy trucks) is not included in "Total Palo Alto+SOI VMT" shown in the table.

Source: Hexagon Transportation Consultants, Inc., October 2015.

As seen in Table 6, Scenario 1, the Business As Usual scenario, leads to the highest VMT projection (5,947,158) and the greatest number of motor vehicle trips (479,198) of the four scenarios, which is consistent with its land use and other assumptions. Scenario 2 results in the lowest VMT projection of the four scenarios (5,741,373), followed closely by Scenario 4 (5,788,497). This result indicates that even though Scenario 4 includes even more housing units than Scenario 1, its pro-transit policies succeed in reducing VMT to a level closer to that of Scenario 2, which has the lowest combined new housing and jobs.

Not surprisingly, Scenario 4, which includes the most policies to maximize transit usage, results in the lowest estimate of non-commercial motor vehicle trips (463,255). As shown on both Table 6 and Table 7, the average trip length is longest under Scenario 4, because more of the shorter trips are being made by bicycling, walking or transit. This mode shift for shorter trips under Scenario 4 is also evidenced by the fact that the percentage of total vehicle trips that are Internal-Internal (entirely within Palo Alto) is lowest under Scenario 4. In Table 6, only 17.8% of the total motor vehicle trips are Internal-Internal under Scenario 4, but are 19% or more for the other three scenarios.

VMT per capita is a metric that utilizes total VMT, as shown in Tables 8 and 9, divided by the total residents and jobs. Table 8 presents information for the City of Palo Alto only and Table 9 presents information for the City of Palo and its sphere of influence (SOI).

Table 8
VMT Per Capita – City of Palo Alto

	Existing	2030			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
Daily VMT	5,320,931	5,947,158	5,741,373	5,853,201	5,788,497
Total Households	27,119	29,703	29,703	30,465	31,303
Total Population	65,686	72,284	72,284	74,121	76,141
Total Jobs	95,458	110,940	105,311	108,216	110,940
VMT per Capita	33.0	32.5	32.3	32.1	30.9

Source: Hexagon Transportation Consultants, Inc., October 2015.

Table 9
VMT Per Capita – City of Palo Alto and Sphere of Influence

	Existing	2030			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
Daily VMT	6,391,293	7,110,437	6,897,508	7,000,886	6,932,573
Total Households	31,546	35,266	35,266	36,028	36,866
Total Population	82,577	92,491	92,491	94,327	96,348
Total Jobs	100,829	116,700	111,071	113,977	116,700
VMT per Capita	34.8	34.0	33.9	33.6	32.5

Source: Hexagon Transportation Consultants, Inc., October 2015.

VMT per capita is projected to decrease under all four of the 2030 scenarios compared with Existing Conditions. As shown in Table 8, of the four scenarios, Scenario 1 results in the highest projection, at 32.5 VMT per capita, and Scenario 4 results in the lowest projection, at 30.9 VMT per capita. The same pattern holds for Table 9, with the sphere of influence included.

6.

Motor Vehicle Level of Service at Intersections

Intersections are critical to the operation of a community's circulation network because they control the capacity of the local street system. Travel delays and congestion typically occur at intersections, and insufficient capacity to handle traffic volumes is most noticeable at intersections. Thus, one of the best ways to characterize how well a city's circulation system is functioning for the motor vehicle drivers using it is to evaluate key intersections.

Study Intersections

The intersections included in the analysis of the four scenarios are identified below and were shown on Figure 1 above. The intersections were selected by City staff as a reasonable representation of Palo Alto's road network by incorporating major streets in different parts of the city. The list includes 12 intersections in the City and two gateway intersections outside of the City (#1 and #8). These are the same intersections that were included in the Existing Conditions report prepared as a previous part of the Comprehensive Plan update process.

1. I-280 Northbound Off-Ramp and Sand Hill Road (Menlo Park)
2. Middlefield Road and Charleston Road
3. Middlefield Road and San Antonio Road (CMP)
4. Alma Street and Charleston Road
5. El Camino Real (SR 82) and Embarcadero Road/Galvez Road (CMP)
6. El Camino Real (SR 82) and Page Mill Road/Oregon Expressway (CMP)
7. El Camino Real (SR 82) and Arastradero Road/Charleston Road (CMP)
8. El Camino Real (SR 82) and San Antonio Road (CMP; Mountain View)
9. Foothill Expressway/Junipero Serra Boulevard and Page Mill Road (CMP)
10. Foothill Expressway and Arastradero Road (CMP)
11. El Camino Real (SR 82) and Sand Hill Road/Alma Street (CMP)
12. Charleston Road and San Antonio Avenue (CMP)
13. University Avenue & El Camino Real, northbound ramps (CMP)
14. University Avenue/Palm Drive & El Camino Real, southbound ramps (CMP)

Eleven of the study intersections are included in the County's Congestion Management Program (CMP), which means that they are intersections of Countywide importance, and they are regularly monitored for performance. All study intersections are signalized intersections.

Traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours of traffic. The AM peak hour of traffic is generally between 7:00 and 9:00 AM, and the PM peak hour is typically between 4:00 and 6:00 PM. It is during these periods that the most congested traffic conditions occur on an average day.

Motor Vehicle Level of Service Methodology and Standards

Motor vehicle Level of Service (LOS) 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 VTA CMP guidelines dictate the use of the 2000 Highway Capacity Manual (HCM) methodology to analyze intersections. Palo Alto uses the same methodology for its intersections. The 2000 HCM operations method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. This method is applied using the TRAFFIX software. Since TRAFFIX is also the CMP-designated intersection level of service evaluation software, the City of Palo Alto employs the CMP default values for the analysis parameters.

The City of Palo Alto LOS standard for signalized non-CMP intersections is LOS D or better. For CMP intersections, the City's LOS standard is LOS E or better, meaning that only LOS F is considered unacceptable. Although VTA's CMP program considers LOS F to be acceptable at Intersection #9, Foothill Expressway and Page Mill Road, because it operated at LOS F in the 1991 Baseline condition, the City of Palo Alto has not adopted that standard for that intersection and adheres to the standard of LOS E or better at all CMP intersections.

Intersection #1, I-280 northbound off-ramp and Sand Hill Road, is located in the City of Menlo Park. Menlo Park's level of service standard for this intersection is LOS D or better.

Intersection #8, El Camino Real and San Antonio Road, is partially located in the City of Mountain View and partially located in the City of Los Altos, but Mountain View is considered the responsible jurisdiction under the CMP program. Mountain View's level of service standard for this intersection, since it is a CMP intersection, is LOS E or better.

The LOS definitions for signalized intersections are shown in Table 10. Motor Vehicle Level of Service D and E are typical at intersections in many urban areas where a high volume of vehicles pass through an intersection physically constrained by adjacent existing structures.

The descriptions of each level of service in Table 10 are framed entirely from the point of view of motor vehicle drivers and their passengers. In many situations, there can be trade-offs between a better level of service for motor vehicles and the safety and comfort of pedestrians and bicyclists. For example, adding travel lanes at an intersection may improve the volume-to-capacity ratio for vehicles, but make it more dangerous and less convenient for pedestrians to cross a wider street. Adding lanes may also allow more vehicles to proceed through an intersection without stopping at a signal, but the increased vehicular travel speeds may reduce the safety for bikes on that roadway. As a third example of this kind of trade-off, at intersections where a minor street has relatively low vehicle volumes but high pedestrian and bicycle volumes, a longer green time for the vehicles on the major street would improve the level of service for the vehicles at the intersection (by reducing the average delay per vehicle), but increase the delay for pedestrians and bicyclists waiting to cross the major street. Thus, it is important to also consider an intersection's operation from the point of view of pedestrians, bicyclists, and transit riders. VTA's *TIA Guidelines* require consideration of other modes of travel when recommending changes to improve an intersection's motor vehicle level of service.

Table 10
Signalized Intersection Level of Service Definitions Based on Average Delay

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	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 20.0
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 some vehicles may still pass through the intersection without stopping.	20.1 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
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 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: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000), p.10-16.

Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact at an intersection. The City of Palo Alto uses the same impact criteria as the CMP, as follows. A project (or scenario, in this TIA) is said to create a significant adverse impact on traffic conditions at a signalized intersection in the City of Palo Alto if for either peak hour:

1. The level of service at the intersection degrades from an acceptable level of service (LOS D or better for non-CMP intersections and LOS E or better for CMP intersections) to an unacceptable level of service.
2. The intersection is already operating at an unacceptable level of service (LOS E or F for non-CMP intersections and LOS F for CMP intersections), and the project causes both the average control delay for the critical movements at the intersection to increase by four or more seconds and the critical volume-to-capacity ratio (V/C) to increase by one percent (0.01) or more.

For both CMP and non-CMP intersections, if an intersection is operating at an unacceptable level of service and the change in critical delay is negative (i.e., decreases), a significant impact is said to occur if the project causes the V/C ratio to increase by 0.01 or more. This can occur if the critical movements at an intersection change.

Intersection #1, at the I-280 NB ramps and Sand Hill Road, is located in the City of Menlo Park. Menlo Park's criteria for determining a significant traffic impact on arterial streets or local approaches to State-controlled signalized intersections is:

1. The level of service at the intersection degrades from an acceptable LOS D or better to an unacceptable level (LOS E or F) or the project causes the intersection to have an increase of 23 seconds greater in average vehicle delay, whichever comes first.
2. The intersection is already operating at LOS E or F, and the project causes an increase of more than 0.8 seconds of average delay to vehicles on all critical movements at the intersection.

Menlo Park's impact criteria are much more stringent than Palo Alto's. However, in the case of Intersection #1 each scenario would have an impact using Palo Alto's criteria as well as Menlo Park's.

Intersection #8, at El Camino Real and San Antonio Road, is a CMP intersection under the jurisdiction of the City of Mountain View. Mountain View uses the same significance criteria as the City of Palo Alto for CMP intersections.

Motor Vehicle Level of Service Results

The 14 study intersections were evaluated by generating turning movement counts for each intersection under each of the four scenarios with the 2030 Travel Demand Forecasting Model, and then using those volumes in the TRAFFIX software to determine each intersection's motor vehicle level of service under each scenario. The results of the LOS analysis under Existing Conditions (as documented in the Existing Conditions Report) and under the four scenarios are summarized in Table 11.

As shown in the table, all 14 intersections are projected to have longer average delays under most of the scenarios than under Existing Conditions, which is consistent with the ADT results presented above. In general, there are more intersections with a substandard level of service in the PM peak hour than in the AM peak hour.

Under Scenario 1, the Business as Usual scenario, there is one intersection with a substandard LOS in the AM and PM peak hours and five intersections with a substandard LOS in the PM peak hour. All six of those intersections would experience a significant impact under Scenario 1, in accordance with the definitions above.

For Scenario 2, to reflect the implementation of expressway improvements, lane configuration changes were made to the following three intersections:

- At El Camino Road and Page Mill Road (#6), the County plans to add a right-turn lane and realign the left-turn lanes on the east approach to the intersection. Also, parking would be removed from the south side of Page Mill Road. Although the LOS would remain at E, the average delay would be shorter in the AM and PM peak hours with this change.
- At Foothill Expressway and Page Mill Road (#9), the County Expressway Plan proposes a grade separation where the through traffic on Page Mill Road would cross over or under Foothill Expressway. This proposed grade separation would result in an improvement from LOS E under the other three scenarios to LOS C under Scenario 2 in the AM peak hour, and from LOS F (with over 5 minutes of average delay time) to LOS D under Scenario 2 in the PM peak hour.
- At Foothill Expressway and Arastradero Road (#10), the County Expressway Plan proposes a grade separation, with Foothill Expressway passing under Arastradero Road, and the construction of a roundabout east of Foothill Expressway. The only signalized intersection would be a 3-legged (T) intersection west of Foothill Expressway, at the Foothill Expressway southbound ramp and Arastradero Road. This newly constructed T intersection would operate at LOS A in both the AM and PM peak hours.

Under Scenario 2, there are three intersections with a substandard level of service and where there would be a significant impact.

Table 11
AM and PM Peak Hour Level of Service Results at Study Intersections, By Planning Scenario

#	Intersection	Peak Hour	Existing			Scenario 1			Scenario 2			Scenario 3			Scenario 4		
			Avg. Delay (sec)	LOS	Crit. V/C	Avg. Delay (sec)	LOS	Crit. V/C	Avg. Delay (sec)	LOS	Crit. V/C	Avg. Delay (sec)	LOS	Crit. V/C	Avg. Delay (sec)	LOS	Crit. V/C
1	I-280 NB Off-Ramp & Sand Hill Rd (Menlo Park)	AM	114.5	F	1.269	164.6	F	1.459	162.9	F	1.454	163.0	F	1.455	164.0	F	1.458
		PM	27.0	C	0.939	57.1	E	1.086	53.8	D	1.076	55.5	E	1.081	55.7	E	1.083
2	Middlefield Rd & Charleston Rd	AM	47.6	D	0.660	50.9	D	0.727	49.7	D	0.702	50.5	D	0.719	50.8	D	0.727
		PM	39.8	D	0.695	56.1	E	0.949	53.2	D	0.930	54.7	D	0.945	55.9	E	0.952
3	Middlefield Rd & San Antonio Rd *	AM	48.9	D	0.668	50.3	D	0.761	49.4	D	0.740	49.7	D	0.750	49.7	D	0.750
		PM	39.0	D	0.789	41.9	D	0.857	44.2	D	0.906	44.3	D	0.904	44.0	D	0.901
4	Alma St & Charleston Rd	AM	33.2	C	0.642	38.7	D	0.824	37.2	D	0.802	27.2	C	0.657	28.2	C	0.679
		PM	48.6	D	0.743	88.9	F	1.063	81.4	F	1.036	41.2	D	0.794	41.5	D	0.797
5	El Camino Real (SR 82) & Embarcadero Rd/Galvez St *	AM	46.1	D	0.729	58.5	E	0.928	58.4	E	0.914	58.1	E	0.914	59.6	E	0.929
		PM	42.5	D	0.824	69.0	E	1.049	68.8	E	1.043	73.2	E	1.061	72.8	E	1.061
6	El Camino Real (SR 82) & Page Mill Rd/Oregon Expy *	AM	62.7	E	0.819	67.3	E	0.882	63.4	E	0.815	66.9	E	0.876	67.4	E	0.878
		PM	52.4	D	0.910	74.2	E	1.056	61.4	E	0.970	74.6	E	1.062	78.5	E	1.082
7	El Camino Real (SR 82) & Arastradero Rd/Charleston Rd *	AM	35.3	D	0.663	38.8	D	0.791	38.2	D	0.771	38.3	D	0.777	38.2	D	0.772
		PM	47.7	D	0.841	68.6	E	1.016	64.1	E	0.992	65.8	E	1.002	66.0	E	1.003
8	El Camino Real (SR 82) & San Antonio Rd (Mtn View)*	AM	40.5	D	0.768	51.9	D	0.942	50.7	D	0.930	50.9	D	0.933	51.4	D	0.936
		PM	54.0	D	0.816	97.9	F	1.069	93.9	F	1.057	96.0	F	1.066	97.7	F	1.077
9	Foothill Expy/Junipero Serra Blvd & Page Mill Rd *	AM	55.7	E	0.909	72.6	E	1.007	27.5	C	0.538	71.4	E	0.999	73.2	E	1.011
		PM	189.7	F	1.064	306.1	F	1.185	43.9	D	0.895	300.1	F	1.160	309.7	F	1.185
10	Foothill Expy & Arastradero Rd *	AM	48.7	D	0.276	52.1	D	0.540	7.1	A	0.190	51.8	D	0.524	52.0	D	0.535
		PM	57.0	E	0.849	147.3	F	1.330	9.4	A	0.468	139.1	F	1.299	144.8	F	1.322
11	El Camino Real (SR 82) & Alma St/Sand Hill Rd *	AM	22.7	C	0.452	22.9	C	0.567	22.8	C	0.547	22.8	C	0.551	23.1	C	0.572
		PM	36.5	D	0.651	39.3	D	0.848	39.0	D	0.847	38.8	D	0.850	38.7	D	0.850
12	San Antonio Rd & Charleston Rd *	AM	48.4	D	0.729	50.9	D	0.812	51.9	D	0.823	51.7	D	0.824	51.8	D	0.830
		PM	42.0	D	0.844	45.5	D	0.878	44.0	D	0.857	43.9	D	0.855	43.7	D	0.851
13	El Camino Real (SR 82) NB Ramps & University Ave *	AM	22.5	C	0.666	35.4	D	0.902	34.2	C	0.891	33.9	C	0.888	35.8	D	0.903
		PM	32.4	C	0.619	32.1	C	0.805	32.3	C	0.807	32.5	C	0.803	32.4	C	0.804
14	El Camino Real (SR 82) SB Ramp & University Ave/Palm Dr *	AM	20.9	C	0.424	19.5	B	0.553	19.1	B	0.534	19.2	B	0.535	19.6	B	0.557
		PM	24.9	C	0.487	23.8	C	0.594	22.3	C	0.562	22.2	C	0.571	23.4	C	0.576

Notes:
 * Denotes CMP intersection
BOLD indicates a level of service worse than the standard for that intersection.
 A box indicates a significant impact.

Source: Hexagon Transportation Consultants, Inc., October 2015

For Scenarios 3 and 4, the following change was made to Intersection #4 for the LOS analysis:

- At the intersection of Alma Street and Charleston Road (#4), these scenarios assume that Caltrain would be in a trench. Removing the train pre-emption from the intersection means that the signal timing could be changed to run much more efficiently. With that change, the level of service is projected to improve from LOS D in the AM peak hour under Scenarios 1 and 2 to LOS C under Scenarios 3 and 4. In the PM peak hour, the intersection would improve from LOS F (and a significant impact) under Scenarios 1 and 2 to LOS D under Scenarios 3 and 4.

The LOS results for Scenario 3 indicate that there would be four intersections with a substandard level of service and where there would be a significant impact.

For Scenario 4, queue jump lanes would be provided on El Camino Real to reflect the implementation of BRT at the intersections along El Camino. However, because the queue jump lanes would be added closest to the right curb, no changes would be made to the mixed-flow lanes.

The LOS results for Scenario 4 indicate that there would be five intersections with a substandard level of service and where there would be a significant impact during at least one of the peak hours.

Intersection Impacts

A significant traffic impact is projected at six out of fourteen study intersections during at least one of the peak hours under at least one of the planning scenarios. The six impacted intersections are as follows:

- Both of the gateway intersections outside of the Palo Alto city limits that were included in this study:
 - I-280 NB Off-Ramp and Sand Hill Road (#1) in Menlo Park
 - El Camino Real and San Antonio Road (#8) in Mountain View and Los Altos
- Two of the intersections on Charleston Road:
 - Middlefield Road and Charleston Road (#2)
 - Alma Street and Charleston Road (#4)
- Both of the intersections on Foothill Expressway:
 - Foothill Expressway and Page Mill Road (#9)
 - Foothill Expressway and Arastradero Road (#10)

The following intersections are projected to operate at a substandard level of service during at least one peak hour and to experience a significant impact under at least one of the scenarios.

I-280 Northbound Off-Ramp and Sand Hill Road (#1). This intersection is projected to operate at LOS F under all four scenarios, during the AM peak hour, largely due to the very high volume of traffic coming from southbound I-280 to the west approach of this intersection, combined with the volume of vehicles exiting the northbound off-ramp from I-280. The intersection is projected to operate at LOS D or E in the PM peak hour. The intersection would be significantly impacted under all four scenarios in both the AM and PM peak hours. Expanding Sand Hill Road from four lanes to six lanes would mitigate the significant impact. Expansion to six lanes would require widening the curb-to-curb street width and modifying the traffic signals. However, this intersection is located in Menlo Park and is under the control of Caltrans. Due to the extremely stringent impact criteria used by Menlo Park, virtually all of the additional trips generated by the four scenarios at this intersection would need to be eliminated through implementation of the mitigation measures described in detail below in order to avoid the significant impact. Even with these mitigation measures, it would not be possible for Palo Alto to eliminate all additional trips. Furthermore, it is not considered feasible to expand capacity on Alpine Road, a parallel route, in order to serve as mitigation for the impact on Sand Hill Road. For these reasons, and because the intersection is outside the control of Palo Alto, the impact is *significant and unavoidable*.

Middlefield Road and East Charleston Road (#2). This intersection is projected to operate at LOS E during the PM peak hour and to be significantly impacted under Scenarios 1 and 4, but not under Scenarios 2 and 3, suggesting that the more intense land use assumptions included in Scenarios 1 and 4 are the reason for the impact. The Charleston-Arastradero Corridor Plan Line indicates that new bike lanes through this intersection will be added in the future, but they would not be expected to mitigate the motor vehicle level of service. In order to avoid the significant impact under Scenarios 1 and 4 through TDM measures, the added traffic would need to be reduced by approximately 9%, so that the intersection would remain at an acceptable level of service. A decrease of 9% would be feasible with implementation of the TDM mitigation program described below. Therefore, with implementation of the mitigation measures described below, under Scenarios 1 and 4, this impact would be *less than significant*.

Alma Street and East/West Charleston Road (#4). This intersection is projected to operate at LOS F in the PM peak period and would be significantly impacted under Scenarios 1 and 2, but would operate at LOS D under Scenarios 3 and 4, due to placing the Caltrain tracks in a trench. Thus, trenching the Caltrain tracks would provide substantial congestion relief at this intersection. The Charleston-Arastradero Corridor Plan Line indicates that new bike lanes through this intersection will be added in the future, but they would not be expected to mitigate the motor vehicle level of service. In order to avoid the significant impact under Scenarios 1 and 2 through implementation of a TDM mitigation program, the traffic would need to be reduced by over 80 percent so that the intersection would remain at LOS D during the PM peak hour. Such a large reduction is not generally considered feasible, even with an extremely aggressive TDM program. Therefore, under Scenarios 1 and 2, this impact is *significant and unavoidable*.

El Camino Real and San Antonio Road (#8). This intersection is projected to operate at LOS F during the PM peak period and would be significantly impacted under all four scenarios. This intersection includes a total of five lanes on its north, east, and south approaches, but only three lanes on the west approach, which is in the City of Los Altos. Although adding lanes on the west approach of the intersection would likely mitigate the substandard level of service, such a measure would require consideration of secondary impacts on the safety of bicyclists and pedestrians. In addition, changes to the west approach of this intersection would require additional right-of-way acquisition, displacement of existing businesses, and is outside the City of Palo Alto, and is therefore not considered feasible. In order to eliminate the significant impact through TDM mitigation measures, the traffic would need to be reduced by 38% - 43%, so that the intersection remained at LOS E during the PM peak hour. A reduction of that magnitude is considered feasible for aggressive TDM programs that are applied to worksites. However, it is unlikely that such a substantial reduction also could be achieved within new housing projects in the El Camino Real corridor or the southern portion of the City near this intersection. Therefore, this impact is *significant and unavoidable*.

Foothill Expressway/Junipero Serra Boulevard and Page Mill Road (#9). This intersection is projected to operate at LOS F during the PM peak hour and would be significantly impacted under Scenarios 1, 3, and 4. Scenario 2 includes a grade separation for this intersection, which would result in an acceptable level of service. The County has proposed to widen Page Mill Road from four to six lanes between Porter Drive and I-280, in addition to the grade separation proposal. Widening would partially mitigate the impact at this intersection under Scenarios 1, 3, and 4, even if the grade separation were not constructed. All of the proposed expressway improvements would be implemented by the Santa Clara County Department of Roads and Airports, and therefore are outside the control of the City of Palo Alto. The County is currently working with both the City of Palo Alto and the Town of Los Altos Hills to develop a plan for Page Mill Road, but a plan has not yet been adopted and funding sources for the improvements have not yet been identified. If the City of Palo Alto ends up being supportive of the grade separation project, it should be included in the City's traffic impact fee. Because this intersection is already operating at LOS F, the increase in average delay in order to avoid an impact under Scenarios 1, 3, and 4 would have to be less than 4 seconds. Since these scenarios are projected to result in 110-120 seconds in increased delay, a TDM mitigation program would need to reduce traffic by over 96%. Such a large reduction would not be feasible, even with an extremely aggressive TDM program. Therefore, under Scenarios 1, 3, and 4, the impacts would be *significant and unavoidable*.

Foothill Expressway and Arastradero Road (#10). This intersection is projected to operate at LOS F during the PM peak hour and would be significantly impacted under Scenarios 1, 3, and 4. Scenario 2 includes a re-design of this intersection to include a roundabout east of Foothill Expressway and a grade separation. However, the intersection is fully built out and no other physical improvements short of grade separation are feasible to mitigate

the impact under Scenarios 1, 3, and 4. If the City of Palo Alto ends up being supportive of the grade separation project, it should be included in the City's traffic impact fee. The grade separation is part of the proposed expressway improvements that would be implemented by the Santa Clara County Department of Roads and Airports, and therefore are outside the control of the City of Palo Alto. In order to eliminate the significant impact through a TDM mitigation program, such a program would need to reduce the additional traffic at this intersection by approximately 75%, so that it would remain at LOS E during the PM peak hour. Such a large reduction would not be feasible, even with an extremely aggressive TDM program. Therefore, under Scenarios 1, 3, and 4, the impacts would be *significant and unavoidable*.

Mitigation Measures for Impacted Intersections

In order to partially mitigate the impacts at the impacted intersections, the City could implement additional policies in order to further reduce reliance on driving alone (Single-Occupant Vehicles) and to further encourage ridesharing, taking transit, bicycling, and walking. These mitigation measures would be as follows:

- a) Adopt a programmatic approach to reducing traffic with the goal of achieving no net increase in peak period motor vehicle trips from new development, with an exception for uses that directly contribute to the neighborhood character and diversity of Palo Alto (such as ground floor retail and below market rate housing). The program should, at a minimum:
 - o Require new development projects to prepare and implement a Transportation Demand Management (TDM) Plan to achieve the following reduction in peak period motor vehicle trips from the rates included in the Institute of Transportation Engineers' *Trip Generation Manual* for the appropriate land use category. These reductions are deemed aggressive, yet feasible, for the districts indicated.
 - i. 45 percent reduction in the Downtown district
 - ii. 35 percent reduction in the California Avenue area
 - iii. 30 percent reduction in the Stanford Research Park
 - iv. 30 percent reduction in the El Camino Real corridor
 - v. 20 percent reduction in other areas of the city.
 - o TDM Plans must be approved by the City and monitored by the property owner on an annual basis. The TDM Plans must contain enforcement mechanisms or penalties that accrue if targets are not met.
 - o Require new development projects to offset remaining peak period motor vehicle trips through one of the following methods:
 - i. By directly contracting with another property owner or organization to reduce trips generated from another site; or
 - ii. By paying an annual fee to the City for use in reducing motor vehicle trips to the extent feasible through the provision of transit services, carpool/rideshare incentives, bicycle lanes, and other similar programs and improvements.
- b) Establish and implement a policy that eliminates ("unbundles") free or subsidized parking in new commercial and residential development (i.e., requiring employees and residents to pay separately for parking).
- c) Work to advance plans for grade separation at intersections along the Caltrain tracks to reduce traffic congestion/delay and improve safety; seek funding for design and implementation from local, regional, state, and federal sources. Ensure that future grade separation projects include a community participation and review process, and undergo environmental review. Future grade separation improvement projects would have the potential to cause environmental impacts, such as impacts associated with construction-related emissions, noise, and traffic, and aesthetics and land use impacts.

These impacts, and alternatives to these grade separation projects, would be evaluated in detail when the projects are more clearly defined.

- d) Take a leadership role in regional transportation planning and advocating for specific transit improvements and investments, such as Caltrain service enhancements, Dumbarton Express service, enhanced bus service on El Camino Real with queue jumping and curbside platforms, and additional VTA bus service.
- e) Work with the Palo Alto Unified School District (PAUSD) to ensure that decisions regarding school assignments are analyzed to reduce peak period motor vehicle trips to and from school sites.

To implement the TDM Plans included in Measure (a) above, all new development projects (residential, commercial, office/R&D, etc.) over a certain size could be required to join and help fund a Transportation Management Agency (TMA). A TMA can assist with the logistics and administrative responsibilities associated with implementation of the TDM Plans for the projects in its area. A TMA for the Downtown business district of Palo Alto has recently been established, and others may be created over the time horizon of this Comprehensive Plan Update. A TMA may also be created to cover the entire City of Palo Alto.

Utilization of the above mitigation measures would reduce but not eliminate the projected impacts at five of the six impacted intersections. At the intersection of Middlefield Road and Charleston Road (#2), implementation of these measures would mitigate the projected impact to a less-than-significant level. However, assuming that the “no net new trips” policy in measure (a) would not be applied to new housing projects or some other land uses that the City chooses to encourage, all of the scenarios would still generate some additional vehicle trips. Further, even though any annual fees paid to the City (for any additional peak period trips not eliminated through a development’s TDM program) would be used to provide transit services, carpool/rideshare incentives, bicycle lanes, and other programs and improvements to reduce motor vehicle trips, there is no guarantee that all such additional trips would be eliminated. Therefore, all of the above traffic mitigation measures would reduce, but not eliminate the projected impacts at five of the six impacted intersections, and the impact is considered significant and unavoidable.

All of the above traffic mitigation measures would benefit bicyclists and pedestrians, and would not cause any secondary impacts to them.

7.

Motor Vehicle Level of Service on Freeway Segments and Ramps

Palo Alto is served by both U.S. 101 and Interstate 280 (I-280). In order to determine whether any of the scenarios would have a significant impact on any of the freeway segments or freeway ramps in Palo Alto, an analysis of the following six interchanges and the freeway segments north and south of them was conducted:

- U.S. 101 at University Avenue
- U.S. 101 at Embarcadero Road/Oregon Expressway
- U.S. 101 at San Antonio Road
- I-280 at Sand Hill Road
- I-280 at Alpine Road
- I-280 at Page Mill Road

Motor vehicle Level of Service standards and definitions of significant impact for freeways in Santa Clara County have been established by VTA as part of the Congestion Management Program. A scenario would cause a freeway segment impact if it caused the segment to operate at LOS F, or, if it is already operating at LOS F, if the scenario would add traffic in excess of 1% of segment capacity. Although not explicitly stated in the CMP TIA guidelines, freeway ramps can be analyzed in the same fashion as freeway segments.

The City/County Association of Governments of San Mateo County (C/CAG) administers the Congestion Management Program for San Mateo County and has established a motor vehicle Level of Service standard of LOS F for the segment of US 101 between Whipple Avenue and the Santa Clara County line and a motor vehicle Level of Service standard of LOS D for the segment of I-280 between SR 84 and the Santa Clara County line, according to C/CAG's 2013 Congestion Management Program report. C/CAG has traditionally used the same definition of significant impact as VTA.

The VTA Congestion Management Program specifies that a capacity of 2,300 vehicles per hour per lane (vphpl) be used for mixed-flow lane segments that are three lanes or wider in one direction, and a capacity of 2,200 vphpl be used for mixed-flow lane segments that are two lanes wide in one direction. A capacity of 1,650 vphpl was used for high occupancy vehicle (HOV) lanes. For auxiliary lanes (an extra lane that is added between interchanges), which are planned for US 101 in the future, a capacity of one-half of a mixed-flow lane, which is 1,150 vphpl, is used. In the year 2030, US 101 will have three mixed-flow lanes with a total capacity of 6,900 vph, one HOV lane, and one auxiliary lane on all of the segments examined, so the total capacity of all lanes is 9,700 vehicles per hour ($6,900 + 1,650 + 1,150 = 9,700$).

In analyzing the freeway segments and ramps, the 2030 travel demand forecasting model was used to project the increase in traffic volumes under all four scenarios. The volumes shown in Table 12 represent the increase (or decrease) in the number of trips made to and/or from Palo Alto on each freeway segment under each scenario in 2030. That is, the table excludes 2030 volumes related to regional traffic growth and shows only the increase or decrease in trips that begin and/or end in Palo Alto. Because trips that begin outside Palo Alto and end outside Palo Alto, due to regional traffic growth, are not included in the table, it is possible to identify freeway segments where one or more of the planning scenarios would have a significant impact.

Several freeway segments on US 101 and I-280 show a decrease in the number of Palo Alto-related trips under all four scenarios (see Table 12). This model result is primarily because the model projects a 25-30% increase in regional freeway volumes in 2030. Because the freeways would become so much more congested by 2030, the model's trip assignment process assumes that many people will seek alternate routes in order to avoid the freeways. Thus, the negative number of trips shown in Table 12 for some segments indicates that there would be so much more regional traffic on that freeway segment that fewer Palo Alto-related trips would use the freeway than under existing conditions. Those trips would presumably be made by taking a different mode (i.e., Caltrain instead of the freeway) or a different route (i.e., Foothill Expressway, El Camino Real, Alma Street, Middlefield Road, etc.).

For segments that are operating at LOS F, the increased volume for each scenario was compared to 1% of the segment's capacity to determine if there would be a significant impact. For example, for all segments on US 101 for which the existing LOS is F, if a scenario would result in more than 97 additional trips (1% of capacity is 97), then the scenario would result in a significant impact. For segments that are not operating at LOS F, the volume of additional trips was examined to see if they would cause the level of service to become LOS F.

As shown on Table 12, all four scenarios would have a significant impact on the following freeway segments:

- Northbound US 101, between Rengstorff Avenue and San Antonio Road, both AM and PM peak hours
- Northbound US 101, between San Antonio Road and Oregon Expressway, AM peak hour
- Northbound US 101, between Embarcadero Road and University Avenue, PM peak hour
- Southbound US 101, between Oregon Expressway and San Antonio Road, PM peak hour
- Southbound US 101, between San Antonio Road and Rengstorff Avenue, PM peak hour
- Northbound I-280, between Sand Hill Road and Woodside Road (SR 84), PM peak hour
- Southbound I-280, between Woodside Road (SR 84) and Sand Hill Road, PM peak hour

Caltrans has no plans to widen the freeways beyond what is already assumed in the capacities shown in the table, and improvements to the freeways are outside the City of Palo Alto's jurisdiction. Implementation of mitigation measures (a), (b), and (d), discussed in the preceding chapter on intersections, would reduce but not eliminate the freeway impacts on most of the freeway segments.

Table 12 shows the percentage by which a TDM mitigation program would need to reduce the increased trip volume in order to avoid an impact. Based on recent experience in Bay Area communities, trip reductions of up to 40% are feasible with implementation of TDM programs that include such measures as private bus services and free shuttle services to transit stations. Provision of additional public transit services, especially express bus routes geared towards commuters, would also help mitigate freeway impacts, but is beyond the control of the City. Except in areas that are extremely well-served by public transit, trip reductions of more than 40% are generally not considered feasible, even with very aggressive TDM programs. Based on that rough guideline, implementation of TDM mitigation measures would eliminate the projected impact on the following freeway segments where the reduction needed is less than approximately 40%:

- Southbound US 101, between Oregon Expressway and San Antonio Road, PM peak hour (All four scenarios)
- Southbound US 101, between San Antonio Road and Rengstorff Avenue, PM peak hour (All four scenarios)
- Northbound I-280, between Sand Hill Road and Woodside Road (SR 84), PM peak hour (Scenarios 2, 3, and 4)

Table 12
Freeway Segment Evaluation

Freeway	Segment	Direction	Total # of Lanes	Capacity (vph) ¹	1% of Capacity	Peak Hour	Existing LOS ²	Increase in Palo Alto Volumes				Trip Reduction Required to Avoid Impact ³			
								Scen 1	Scen 2	Scen 3	Scen 4	Scen 1	Scen 2	Scen 3	Scen 4
US 101	Rengstorff to San Antonio Road	NB	4.5	9700	97	AM	F	265	232	257	258	63%	58%	62%	62%
							F	244	174	185	249	60%	44%	48%	61%
US 101	San Antonio Road to Oregon Expwy	NB	4.5	9700	97	AM	F	277	265	264	266	65%	63%	63%	64%
							E	379	299	296	360				
US 101	Oregon Expwy to Embarcadero Rd	NB	4.5	9700	97	AM	D	110	101	104	116				
							D	414	228	268	402				
US 101	Embarcadero Rd to University Ave	NB	4.5	9700	97	AM	F	15	4	6	16				
							F	312	170	218	281	69%	43%	56%	65%
US 101	University Ave to Willow Road	NB	4.5	9700	97	AM	F	-63	-109	-66	-71				
							F	-57	-171	-129	-93				
US 101	Willow Road to University Ave	SB	4.5	9700	97	AM	F	-340	-367	-342	-263				
							F	-61	-87	-72	-43				
US 101	University Ave to Embarcadero Rd	SB	4.5	9700	97	AM	F	-436	-481	-450	-380				
							F	-90	-109	-101	-70				
US 101	Embarcadero Rd to Oregon Expwy	SB	4.5	9700	97	AM	E	-130	-138	-107	-155				
							F	-209	-204	-199	-237				
US 101	Oregon Expwy to San Antonio Ave	SB	4.5	9700	97	AM	E	242	227	268	220				
							F	156	151	164	134	38%	36%	41%	28%
US 101	San Antonio Ave to Rengstorff Ave	SB	4.5	9700	97	AM	D	182	182	219	173				
							F	114	107	131	99	15%	9%	26%	2%
I-280	El Monte to Page Mill Road	NB	4	9200	92	AM	D	-259	-324	-296	-262				
							C	-40	-53	-40	-26				
I-280	Page Mill Road to Alpine Road	NB	4	9200	92	AM	C	-11	-18	-13	3				
							D	-25	-69	-36	-49				
I-280	Alpine Road to Sand Hill Road	NB	4	9200	92	AM	A	-61	-52	-50	-36				
							F	-50	-109	-73	-75				
I-280	Sand Hill Road to Woodside Rd (84)	NB	4	9200	92	AM	A	323	305	323	354				
							F	180	106	128	130	49%	13%	28%	29%
I-280	Woodside Rd (84) to Sand Hill Road	SB	4	9200	92	AM	A	222	145	180	221				
							F	264	248	263	285	65%	63%	65%	68%
I-280	Sand Hill Road to Alpine Road	SB	4	9200	92	AM	A	-17	-76	-40	-32				
							F	9	31	10	31				
I-280	Alpine Road to Page Mill Road	SB	4	9200	92	AM	D	-17	-79	-42	-38				
							C	-153	-158	-158	-134				
I-280	Page Mill Road to El Monte Avenue	SB	4	9200	92	AM	C	-3	-15	-7	-4				
							F	-397	-439	-434	-364				

Notes:
¹ Capacity is based on the capacities cited in VTA's *Transportation Impact Guidelines*, October 2014.
² Sources for Existing LOS: Santa Clara County LOS levels taken from VTA CMP Monitoring Report, 2013.
San Mateo County LOS levels for US 101 taken from a recent TIA prepared for a proposed project.
San Mateo County LOS levels for I-280 taken from C/CAG 2013 Monitoring Report.
³ For impacted intersections, this is the amount by which the increased volume is in excess of the segment capacity as a percentage of the total increased volume.
Bold and boxed indicates a significant impact. For segments already operating at LOS F, an impact occurs if the additional trips generated by a scenario are greater than 1% of the segment's capacity. For segments not already operating at LOS F, an impact occurs if the scenario would cause the LOS to drop to F. It was assumed that if the additional trips generated by a scenario were greater than 10% of capacity, the level of service would drop by one grade level. If additional trips were greater than 20% of capacity, the level of service would drop by two grade levels.

Source: Hexagon Transportation Consultants, Inc., October 2015.

On the other four impacted freeway segments, the trip reduction needed to avoid an impact is greater than 40% and therefore the TDM mitigation measure would reduce but not eliminate the impact. Thus, these impacts are considered *significant and unavoidable*.

To analyze potential impacts on ramps, the additional volume generated by each of the scenarios was added to the existing ramp volume. Existing ramp volumes were obtained from Caltrans. The total volume under each scenario was compared to the ramp capacity. A significant impact would occur if the volume-to-capacity ratio for a given ramp would exceed 1.0. As shown on Table 13, none of the scenarios would have a significant impact on any of the ramps, because the volume-to-capacity ratio would remain less than 1.0 at all of the ramps.

Table 13
Freeway Ramp Evaluation

Interchange	Code	Ramp	Capacity	Existing			Scenario 1			Scenario 2			Scenario 3			Scenario 4		
				Model	Count	v/c	Model	Adj. Vol.	v/c	Model	Adj. Vol.	v/c	Model	Adj. Vol.	v/c	Model	Adj. Vol.	v/c
US 101/University	1	NB on	20,000	6,430	8,800	0.44	7,085	9,455	0.47	6,715	9,085	0.45	6,885	9,255	0.46	6,765	9,135	0.46
	2	NB off	40,000	8,185	10,500	0.26	14,980	17,295	0.43	14,565	16,880	0.42	14,820	17,135	0.43	14,680	16,995	0.42
	3	SB off	36,000	4,415	12,400	0.34	6,870	14,855	0.41	6,070	14,055	0.39	6,765	14,750	0.41	6,470	14,455	0.40
	4	SB on	40,000	9,940	15,000	0.38	11,005	16,065	0.40	10,585	15,645	0.39	10,010	15,070	0.38	10,210	15,270	0.38
US 101/ Embarcadero /Oregon Xway	5	NB on fr. Embarcadero WB	20,000	1,155	1,950	0.10	2,220	3,015	0.15	2,065	2,860	0.14	2,195	2,990	0.15	2,240	3,035	0.15
	6	NB off to Embarcadero EB	20,000	3,735	5,800	0.29	5,035	7,100	0.36	4,965	7,030	0.35	5,145	7,210	0.36	5,215	7,280	0.36
	7	NB on fr. Embarcadero EB (loop)	18,000	60	3,850	0.21	310	4,100	0.23	295	4,085	0.23	305	4,095	0.23	300	4,090	0.23
	8	NB off to Embarcadero WB (loop)	18,000	9,895	6,800	0.38	13,290	10,195	0.57	12,765	9,670	0.54	12,975	9,880	0.55	12,920	9,825	0.55
	9	SB off to Oregon Xway	20,000	10,070	12,900	0.65	8,970	11,800	0.59	8,865	11,695	0.58	9,600	12,430	0.62	9,485	12,315	0.62
	10	SB off to Embarcadero EB (loop)	18,000	1,545	2,750	0.15	1,050	2,255	0.13	1,045	2,250	0.13	1,160	2,365	0.13	1,155	2,360	0.13
	11	WB Embarcadero to WB Oregon Xway (loop)	18,000	1,255	6,600	0.37	2,275	7,620	0.42	2,370	7,715	0.43	2,340	7,685	0.43	2,480	7,825	0.43
	12	SB off to Embarcadero WB	20,000	2,410	2,750	0.14	1,425	1,765	0.09	1,200	1,540	0.08	935	1,275	0.06	1,555	1,895	0.09
	13	SB on fr. Oregon Xway EB	40,000	3,065	8,000	0.20	9,980	14,915	0.37	9,515	14,450	0.36	9,690	14,625	0.37	9,465	14,400	0.36
	14	NB on fr. Oregon Xway EB (loop)	18,000	7,525	16,000	0.89	7,330	15,805	0.88	7,180	15,655	0.87	7,890	16,365	0.91	8,025	16,500	0.92
	15	NB off to Oregon Xway WB	20,000	2,010	7,200	0.36	2,740	7,930	0.40	2,575	7,765	0.39	2,840	8,030	0.40	2,845	8,035	0.40
US 101/San Antonio	16	NB on	18,000	440	1,800	0.10	3,530	4,890	0.27	3,530	4,890	0.27	3,335	4,695	0.26	3,385	4,745	0.26
	17	NB off	20,000	5,410	8,200	0.41	6,425	9,215	0.46	5,955	8,745	0.44	6,015	8,805	0.44	6,000	8,790	0.44
	18	NB on (loop)	18,000	8,705	10,900	0.61	9,605	11,800	0.66	9,235	11,430	0.64	9,270	11,465	0.64	9,235	11,430	0.64
	19	SB off (loop)	18,000	540	1,500	0.08	1,040	2,000	0.11	1,000	1,960	0.11	950	1,910	0.11	1,020	1,980	0.11
	20	SB off	20,000	7,970	10,300	0.52	10,360	12,690	0.63	9,880	12,210	0.61	9,755	12,085	0.60	9,705	12,035	0.60
I-280/Sandhill	21	NB on fr. Sandhill WB	20,000	11,975	9,000	0.45	14,315	11,340	0.57	13,865	10,890	0.54	13,940	10,965	0.55	13,895	10,920	0.55
	22	NB off to Sandhill	20,000	8,260	5,300	0.27	5,420	2,460	0.12	5,465	2,505	0.13	5,500	2,540	0.13	5,245	2,285	0.11
	23	SB on fr. Sandhill EB	20,000	275	1,050	0.05	520	1,295	0.06	450	1,225	0.06	460	1,235	0.06	480	1,255	0.06
	24	SB off to Sandhill WB	20,000	0	910	0.05	5	915	0.05	5	915	0.05	5	915	0.05	5	915	0.05
	25	SB on fr. Sandhill WB (loop)	18,000	2,855	4,200	0.23	2,865	4,210	0.23	2,800	4,145	0.23	2,785	4,130	0.23	2,775	4,120	0.23
	26	NB off to Sandhill WB (loop)	18,000	215	1,100	0.06	695	1,580	0.09	610	1,495	0.08	605	1,490	0.08	635	1,520	0.08
	27	NB on fr. Sandhill EB (loop)	18,000	0	1,000	0.06	25	1,025	0.06	0	1,000	0.06	15	1,015	0.06	15	1,015	0.06
	28	SB off to Sandhill EB (loop)	18,000	13,480	9,100	0.51	16,275	11,895	0.66	15,590	11,210	0.62	15,550	11,170	0.62	15,690	11,310	0.63
I-280/Page Mill	29	NB off	40,000	13,320	12,000	0.30	13,830	12,510	0.31	12,830	11,510	0.29	12,935	11,615	0.29	13,180	11,860	0.30
	30	SB on	20,000	1,285	1,900	0.10	2,155	2,770	0.14	2,020	2,635	0.13	2,050	2,665	0.13	2,095	2,710	0.14
	31	SB off	20,000	12,700	7,900	0.40	14,805	10,005	0.50	14,040	9,240	0.46	14,160	9,360	0.47	14,280	9,480	0.47
	32	NB on	20,000	6,340	6,300	0.32	11,165	11,125	0.56	10,705	10,665	0.53	10,765	10,725	0.54	11,035	10,995	0.55
	33	NB on (loop)	18,000	2,740	2,000	0.11	2,290	1,550	0.09	2,190	1,450	0.08	2,200	1,460	0.08	2,255	1,515	0.08
	34	SB on (loop)	36,000	6,760	8,900	0.25	5,230	7,370	0.20	4,915	7,055	0.20	5,020	7,160	0.20	4,900	7,040	0.20
I-280/Alpine	35	NB off	20,000	1,905	8,600	0.43	3,910	10,605	0.53	3,635	10,330	0.52	3,665	10,360	0.52	3,775	10,470	0.52
	36	SB on	20,000	2,185	2,250	0.11	1,435	1,500	0.08	1,380	1,445	0.07	1,375	1,440	0.07	1,375	1,440	0.07
	37	SB off	20,000	2,225	4,000	0.20	2,115	3,890	0.19	2,170	3,945	0.20	2,105	3,880	0.19	2,110	3,885	0.19
	38	NB on	20,000	2,255	4,300	0.22	975	3,020	0.15	1,045	3,090	0.15	980	3,025	0.15	1,000	3,045	0.15
	39	SB on (loop)	18,000	3,890	5,300	0.29	3,660	5,070	0.28	3,490	4,900	0.27	3,515	4,925	0.27	3,465	4,875	0.27

Note: Existing counts for all ramps were obtained from the Caltrans website. <http://traffic-counts.dot.ca.gov/docs/2013-ramp-vol-district04.pdf>.

Source: Hexagon Transportation Consultants, Inc., October 2015.

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8.

Other Potential Impacts

This chapter addresses other potential impacts of the Comprehensive Plan scenarios on the City's transportation network that were not addressed in the preceding chapters. These other potential impacts are divided into two sub-categories: those that are related to the CEQA guidelines and must be addressed as part of an EIR and those that are not CEQA-related and are presented only for informational purposes. The latter category includes an evaluation of travel times on street segments and a Multimodal Level of Service analysis comparable to the analysis included in the Existing Conditions Report.

Additional CEQA-Related Potential Impacts

Would any of the scenarios impede the operation of a transit system as a result of congestion?

Although this is a transit-related impact, it can only be evaluated in light of the projected levels of congestion at the intersections and on the roadway segments where bus and shuttle services operate. Additional roadway congestion would not impact Caltrain operations. Buses are subject to the same delays caused by roadway congestion as other vehicles. In fact, travel times for buses are even more sensitive to congestion than other vehicular traffic as it becomes more difficult for bus drivers to merge back into a traffic lane after pulling over into a bus stop. Thus, if a segment or intersection becomes more congested in the future, buses would experience longer travel times.

The exception to this congestion impact on transit would be an exclusive lane for buses, as proposed by VTA in some of the alternatives in its *El Camino Real Bus Rapid Transit (BRT) Traffic Operations Analysis Report*, but none of the scenarios included in this TIA incorporate a dedicated lane for buses within Palo Alto. Scenario 4 includes queue jump lanes for buses on El Camino Real to allow them to proceed more quickly through congested intersections than they otherwise would. Queue jump lanes could also be included in other scenarios as a mitigation measure.

All four scenarios would cause some degradation in level of service on at least one roadway segment (see Table 5, ADTs and Segment Level of Service) and have a significant impact on multiple intersections (see Table 11, Intersection Level of Service). Transit services that travel on those roadway segments and use those impacted intersections would be slowed down by the increased congestion. Thus, all four scenarios would have a significant impact on transit operations by increasing congestion.

The implementation of the mitigation measures discussed in Chapter 6 for impacted intersections would reduce but not eliminate the congestion and its impact on transit. An additional appropriate mitigation would be to provide signal priority for buses at intersections with an unacceptable level of service and bulb-outs at bus stops. These measures would be sufficient mitigation to eliminate the impact on transit at the following study intersections, which are projected to operate at a substandard level of service and are used by at least one bus route:

- Middlefield Road and Charleston Road (#2) under Scenarios 1 and 4

- El Camino Real and San Antonio Road (#8) under Scenarios 1, 2, 3, and 4
- Foothill Expressway/Junipero Serra Blvd. and Page Mill Road (#9) under Scenarios 1, 3, and 4
- Foothill Expressway and Arastradero Road (#10) under Scenarios 1, 3, and 4
- Alma Street and Charleston Avenue (#4) under Scenarios 1 and 2

VTA Route 88 runs on Charleston Avenue and crosses the Caltrain tracks and Alma Street. The intersection of Alma Street and Charleston Avenue (#4), is one of the impacted intersections under Scenarios 1 and 2, but signal pre-emption for VTA's bus service would not be possible at this location, due to the railroad crossing and the need for Caltrain to have signal pre-emption capabilities. However, signal priority for VTA buses should be possible at this intersection, and would provide sufficient mitigation to eliminate the impact on transit at this intersection..

Although the intersection of I-280 northbound Off-Ramp and Sand Hill Road (#1) would operate at level F under all four scenarios, there would not be a congestion-related impact on transit because this intersection is not used by SamTrans or VTA services.

In addition, queue jump lanes and curbside platforms on El Camino Real (included as part of Scenario 4, but not Scenarios 1, 2, and 3) could be implemented to reduce the effects of traffic congestion on VTA buses in the El Camino corridor.

However, even with implementation of the above mitigation measures, congestion at all intersections and roadway segments where buses operate would not be eliminated. Thus, all four scenarios would have a significant impact on transit operations by increasing congestion. These impacts are considered *significant and unavoidable*.

Would any of the scenarios create the potential demand for through traffic to use local residential streets?

Increased congestion on arterials can result in some drivers attempting to avoid the congestion by using local residential streets instead. Thus, on segments that would experience a degradation in the motor vehicle level of service in the future, a scenario may be said to create demand for traffic from congested arterials to be diverted onto local residential streets. As shown on Table 5, eight of the 13 studied segments are projected to experience a decline in level of service under at least one scenario, compared with Existing Conditions.

All four scenarios include at least one segment where the level of service would decline, compared with Existing Conditions, as shown in Table 5, so all four scenarios would potentially cause a significant impact on local residential streets. The greater the decline in level of service, the more likely that some drivers would seek alternate routes, some of which could be local residential streets. For example, on Embarcadero Road (Segment #9), the level of service is projected to decline from LOS C to LOS E under Scenarios 1, 3 and 4, which may motivate some drivers to seek alternate routes.

Implementation of the mitigation measures discussed previously in Chapter 6 would reduce but not eliminate this potential impact.

Another appropriate mitigation for traffic diverted from congested arterials onto local streets would be the installation of traffic calming measures. Implementation of traffic calming is highly site-specific, depending on the physical characteristics of the street, the circulation pattern of a neighborhood, and whether the residents support such measures, among many other factors. It is not possible at the Comprehensive Plan level to determine where traffic calming measures would be appropriate or feasible or which specific measures should be implemented along a given roadway or at a given intersection. For example, one neighborhood might support the installation of speed humps, whereas other neighborhoods might not – or, some residents of a specific neighborhood may advocate for speed humps while other residents oppose them. In all situations, traffic calming should be addressed on a case-by-case basis with ample opportunity for public input and a careful analysis of a neighborhood's entire street network.

As mitigation for potential cut-through impacts, the City would adopt a proactive neighborhood traffic calming program with a tool box of specific improvements that can be used to discourage non-local drivers from using local neighborhood streets to bypass traffic congestion on arterials.. The program should include metrics for defining streets eligible for traffic calming, a process for implementing traffic calming, and a list of acceptable traffic calming measures. The program should require analysis of the entire street network of a neighborhood, not

isolated streets. With such a program in place, the potential impact on local residential streets would be *less than significant*.

Would any of the scenarios create an operational safety hazard?

None of the scenarios call for any policies or physical changes to the City's transportation network or other facilities that would introduce any safety hazards. The Comprehensive Plan is a long-range planning document that would guide future development in the city, but would not introduce any physical features that would create a safety hazard. Thus, none of the four scenarios would result in a significant impact by creating an operational safety hazard.

Would any of the scenarios result in inadequate emergency access?

The issue of adequate emergency access typically applies to specific development proposals where a project's street access may be evaluated. Adequacy of emergency access requires case-by-case site analysis of individual projects, which is not possible for the four scenarios. To the extent that global land use and transportation assumptions included in the scenarios result in roadway congestion that causes delay for other vehicles, emergency vehicles would be slowed down, too. However, emergency vehicles have the right to use lights and sirens to allow them to bypass the congestion. Even in cases where an intersection is operating at LOS F or a roadway segment is operating at LOS F, all other vehicles are required by State law to pull over to the right and allow the emergency vehicle to pass. Thus, none of the four scenarios would result in a significant impact to emergency access.

Motor Vehicle Travel Times

The Existing Conditions Report prepared during an earlier phase of the Comprehensive Plan Update process included motor vehicle travel times on five roadway segments. Motor vehicle travel times provide another way of understanding roadway conditions from the point of view of drivers, but they are not used to determine if there would be a significant impact under CEQA. For the Existing Conditions Report, five roadway segments were driven once in each direction during the AM peak hour, the PM peak hour, and at midday, and the resulting travel times were reported. The five segments were:

- Charleston-Arastradero, between I-280 and San Antonio Road
- Embarcadero Road, between El Camino Real (SR 82) and US 101
- Middlefield Road, between University Avenue and San Antonio Road
- Alma Street, between University Avenue and San Antonio Road
- El Camino Real, between Sand Hill Road and San Antonio Road

Clearly, it is not possible to drive these segments in the conditions that would exist in the year 2030 under each of the planning scenarios. The only method for determining the travel times in the future is through the Palo Alto travel demand forecasting model used throughout this TIA. Based on the increases in ADT on the above segments and the increases in delay (in seconds) at the study intersections on each segment, it is possible to project whether or not motor vehicle travel times would noticeably increase.

Charleston-Arastradero, between I-280 and San Antonio Road: This segment includes both Segments #5 and #11, as they were defined for ADT purposes, and five of the study intersections: at Foothill Expressway (#10), at El Camino Real (#7), at Alma (#4), at Middlefield (#2), and at San Antonio Road (#12). Average delay at all of these intersections would increase substantially under all 2030 scenarios, especially during the PM peak hour, with two exceptions. The intersection at Foothill Expressway would improve under Scenario 2, due to the proposed grade separation. The intersection at Alma Street would improve under Scenarios 3 and 4, due to the construction of a trench for Caltrain. Segment LOS is projected to decline from LOS A to LOS C on Segment #5 (west of El Camino) and from LOS D to LOS E on Segment #11 (east of El Camino). Thus, motor vehicle travel times would be expected to increase under all four scenarios, especially during the PM peak hour when the increased delay at intersections would be greatest. Motor vehicle travel times would increase the most under

Scenario 1, the Business as Usual scenario, since the other three scenarios each include one intersection that would actually operate with less delay than it currently does.

Embarcadero Road, between El Camino Real (SR 82) and US 101: This segment is the same as Segment #9, as defined for ADT purposes. Segment level of service would decline from LOS C to LOS D under Scenario 2 and to LOS E under the other three scenarios. ADT is projected to increase by at least 29% (Scenario 2), and more under the other scenarios. The only study intersection on this segment is #5, at El Camino Real, where the level of service is projected to decline from LOS D to LOS E under all scenarios in both the AM and PM peak hour. Therefore, motor vehicle travel times would be expected to increase under all four scenarios, especially in the PM peak hour where the increased seconds of delay at the study intersection is greatest, going from 42.5 seconds under Existing Conditions to 72.8 seconds under Scenario 4.

Middlefield Road, between University Avenue and San Antonio Road: This segment is the same as Segment #7, as defined for ADT purposes. ADT is not projected to increase by nearly as much (both in absolute terms and on a percentage basis) on this segment as on most of the other segments. The segment LOS is projected to remain at LOS D under all four scenarios. The only study intersections on this segment are #2 (at Charleston Road) and #3 (at San Antonio Road). The level of service at the intersection of Middlefield and Charleston is projected to decline from LOS D to LOS E in the PM peak hour under Scenarios 1 and 4, but remain at LOS D under the Scenarios 2 and 3. The level of service at the intersection of Middlefield and San Antonio Road is projected to remain at LOS D under all four scenarios in both the AM and PM peak hours. Thus, compared to the other segments, the motor vehicle travel time would likely increase only slightly compared to Existing Conditions, but would increase most under Scenarios 1 and 4.

Alma Street, between University Avenue and San Antonio Road: This segment is the same as Segment #6, as defined for ADT purposes. ADT is projected to increase by about 20% under all four scenarios, and the segment level of service is projected to decline from LOS D to LOS E under all four scenarios. The only study intersection on Alma is at Charleston (#4). As described above for the Charleston segment, this intersection is projected to go from LOS D to LOS F under Scenarios 1 and 2. However, since Scenarios 3 and 4 include a trench for Caltrain, the intersection level of service would not decline under those scenarios. Motor vehicle travel times on Alma would likely increase substantially under Scenarios 1 and 2, but much less so under Scenarios 3 and 4 with the construction of a Caltrain trench.

El Camino Real, between Sand Hill Road and San Antonio Road: This segment includes both Segments #2 and #3, as they were defined for ADT purposes. The segment north of Page Mill Road (#2) would decline from LOS C to LOS D, and the segment south of Page Mill Road (#3) would decline from LOS B to LOS C under all four scenarios. Although Scenario 4 includes queue jump lanes for BRT service, this would not affect vehicular travel times much because it would shift, not remove, existing travel lanes. This segment includes five study intersections: at Alma Street/Sand Hill Road (#11), at Embarcadero/Galvez (#5), at Page Mill Road (#6), at Arastradero Road/Charleston Road (#7), and at San Antonio Road (#8). In addition, intersections #13 and #14 include the ramps from El Camino at University Avenue and Palm Drive. Level of service is not projected to change at the intersection at Alma/Sand Hill Road, but is projected to decline from LOS D to LOS E during the PM peak hour under all four scenarios at Embarcadero, at Page Mill Road, and at Arastradero/Charleston. It is projected to decline to LOS F during the PM peak hour under all four scenarios at San Antonio Road. Accordingly, the motor vehicle travel times on El Camino Real would likely increase moderately during the AM peak hour and greatly during the PM peak hour.

Multimodal Level of Service

As was done for the Existing Conditions Report prepared in August 2014 for the Comprehensive Plan Update, the Multimodal Level of Service (MMLOS) was analyzed on two roadway segments: University Avenue and Park Boulevard. The MMLOS methodology is based on the *2010 Highway Capacity Manual* and incorporates all modes of travel – motor vehicles, transit, pedestrians, and cyclists – in the evaluation. This broader view of how well a roadway functions for all of its users is consistent with the State of California's Complete Streets mandate and current trends in the transportation planning field.

However, because neither the City nor VTA has officially adopted this MMLOS methodology or any criteria regarding what would constitute a significant impact when using it, this analysis is not used as the basis for any

impact findings under CEQA. The City and VTA are currently developing guidelines for analyzing potential impacts on pedestrians, bicyclists, and transit users that are focused on issues of connectivity, pedestrian access to transit, and upgrading facilities to current ADA standards, which are not parts of the MMLOS methodology.

Multimodal Level of Service Methodology and Standards

The multimodal levels of service within this TIA are calculated based on the *2010 Highway Capacity Manual* (HCM) level of service methodology. This method separately evaluates roadway facilities from the perspectives of automobile drivers, pedestrians, bicyclists, and transit riders.

When analyzing MMLOS, it is important to analyze the roadway facility in segments. The different segments of the roadway facility are defined by the changes in the physical configurations or attributes along the roadway. That is, each segment should be fairly uniform along its entire length in terms of providing similar facilities for all modes. Where the facilities change for one or more modes (e.g., a change in bike lanes or sidewalk width or vehicular travel lanes), a different segment is identified. To ensure that the roadway segments of each multimodal facility exhibit similar characteristics for the different modes of transportation, the analysis was conducted on the following segments:

Multimodal roadway segments on University Avenue:

1. University Avenue between High Street and Cowper Street
2. University Avenue between Cowper Street and Woodland Avenue

Multimodal roadway segments on Park Boulevard:

1. Park Boulevard between Whitclem Drive and Charleston Road
2. Park Boulevard between Charleston Road and Lambert Avenue
3. Park Boulevard between Lambert Avenue and California Avenue
4. Park Boulevard between California Avenue and El Camino Real (SR 82)

The HCM methodology and level of service definitions for each mode are discussed below in detail.

Motor Vehicle Mode

The motor vehicle mode level of service under MMLOS is evaluated based on average travel speed for through-movement vehicles and the critical volume-to-capacity (V/C) ratio for the through movement at the boundary intersections. If the critical V/C ratio is more than 1.0, the level of service is F, regardless of the average travel speed. If the V/C ratio is less than 1.0, then the level of service is determined by the average travel speed as a percentage of the segment's base free-flow speed, which is defined as the segment's speed limit. The average travel speed reflects delays incurred by through vehicles along the roadway facility and boundary intersections. These two criteria together indicate the degree of motor vehicle mobility provided by the facility. The level of service definitions for motor vehicle mode are shown in Table 14.

It should be noted that the basis for calculating the motor vehicle level of service for the multimodal analysis is different from calculating the level of service for roadway segments as presented in Chapter 5. For the multimodal analysis, both the critical V/C ratio for the peak hours and the average travel speed of through traffic is considered. For the standard (non-multimodal) analysis of roadway segments, only the daily (24-hour) V/C ratio is considered. Furthermore, the level of service definitions for intersections are also different from the MMLOS definitions, since intersection level of service is based on the average delay of all turning movements at an intersection.

Table 14
Multimodal Level of Service Definitions – Motor Vehicle Mode

Travel Speed as a Percentage of Base Free-Flow Speed (%)	LOS by Critical Volume-to-Capacity Ratio ¹	
	≤ 1.0	> 1.0
> 85	A	F
> 67-85	B	F
> 50-67	C	F
> 40-50	D	F
> 30-40	E	F
≤ 30	F	F

Note:
 1 The critical volume-to-capacity ratio is based on consideration of the through movement volume-to-capacity ratio at each boundary intersection in the subject direction of travel. The critical volume-to-capacity ratio is the largest ratio of those considered.

Source: Transportation Research Board, *2010 Highway Capacity Manual* (Washington, D.C., 2010) p16-8

Pedestrian Mode

Pedestrian level of service is determined based on a combination of two parameters: pedestrian LOS score and average pedestrian walk space on the sidewalk. The pedestrian LOS score indicates the typical pedestrian perception of the overall travel experience. The pedestrian LOS score for each sidewalk segment is based on a number of factors, including the width of the sidewalk, separation from the street, vehicular volume and speed, and pedestrian delay at intersections due to conflicting vehicular volumes. A lower pedestrian LOS score would represent a “better” quality of service.

The average pedestrian walk space represents the pedestrian’s ability to walk freely on the sidewalk. Since pedestrians are sensitive to their walk speed and space, the average pedestrian walk space parameter provides a direct indication of segment sidewalk levels of service. A larger walk space would correspond to a “better” sidewalk operation. The level of service definitions for the pedestrian mode are shown in Table 15.

Since the pedestrian mode LOS is based on both the pedestrian LOS score and the average pedestrian walk space, the pedestrian mode LOS for a roadway facility is determined in Table 15 by finding the intersection of the row corresponding to the calculated LOS score and the column corresponding to the calculated walk space.

Table 15
Multimodal Level of Service Definitions – Pedestrian Mode

Pedestrian LOS Score ¹	LOS by Average Pedestrian Space (ft ² / p)					
	>60	>40-60	>24-40	>15-24	>8.0-15	≤ 8.0
≤ 2.00	A	B	C	D	E	F
> 2.00-2.75	B	B	C	D	E	F
> 2.75-3.50	C	C	C	D	E	F
> 3.50-4.25	D	D	D	D	E	F
> 4.25-5.00	E	E	E	E	E	F
> 5.00	F	F	F	F	F	F

Note:
 1 Pedestrian LOS scores are determined using mathematical equations modeling pedestrian perceptions of sidewalk operations. A lower pedestrian LOS score represents a “better” quality of service.

Source: Transportation Research Board, *2010 Highway Capacity Manual* (Washington, D.C., 2010) p16-8

Bicycle Mode

The bicycle mode level of service is evaluated based on the bicycle LOS score. These scores indicate the typical bicyclist perception of the overall travel experience. The bicycle LOS score for each roadway segment is based on a number of factors, including available roadway width for bicycle travel, vehicular volumes, number of driveways, and delay at intersections. A lower bicycle LOS score would represent a “better” quality of service. The correlation between the bicycle LOS score and the bicycle mode LOS is shown in Table 16.

Table 16
Multimodal Level of Service Definitions – Bicycle and Transit Modes

Bicycle/Transit LOS Score ¹	LOS
≤ 2.00	A
> 2.00-2.75	B
> 2.75-3.50	C
> 3.50-4.25	D
> 4.25-5.00	E
> 5.00	F

Note:

1 Bicycle/Transit LOS scores are determined using mathematical equations modeling bicyclist or transit rider perceptions of the bicycle or transit mode operations, respectively. A lower LOS score represents a “better” quality of service.

Source: Transportation Research Board, *2010 Highway Capacity Manual* (Washington, D.C., 2010) p16-8

Transit Mode

The transit mode level of service is evaluated based on the transit LOS score. These scores indicate the typical transit rider perception of the overall commute experience. The transit rider commute experience typically includes the rider wait delays at the bus stop, transit travel speed, and rider comfort. The transit LOS score for each roadway segment is primarily based on the transit dwell time, frequency, and delay, as well as vehicular volume at boundary intersections and mid-segments. A lower transit LOS score would represent a “better” quality of service. The correlation between the transit level of service score and the transit mode level of service is shown in Table 16 above.

Multi-Modal Roadway Facility Levels of Service

Table 17 presents the level of service for the roadway segments included in the multimodal analysis for both the AM and PM peak hours under Existing Conditions and under all four scenarios. Key inputs to this evaluation included increases in vehicular volumes, which were based on the ADTs calculated by the 2030 Travel Demand Model, and increases in the bike and pedestrian volumes, which were based on the mode share increases discussed above. A planned increase in SamTrans service on University Avenue between Cowper Street and Woodland Avenue, the only segment that includes transit service, was an input to the transit mode.

In general, most of the levels of service calculated with the HCM 2010 MMLOS methodology would be the same in 2030 as under Existing Conditions. All of the levels of service for all of the modes would be the same under all four of the scenarios. With the single exception of University Avenue between High Street and Cowper Street for the motor vehicle mode in the PM peak hour, all other segments were estimated to have a level of service of LOS D or better for all modes in both the AM and PM peak hours under all four scenarios.

On that same segment of University Avenue, the pedestrian mode is projected to deteriorate from LOS A to LOS B in the westbound direction during the AM peak hour. That change is due to increased vehicular volumes making right turns from University Avenue onto cross-streets, making left turns (where permitted) from University Avenue onto cross-streets, and making right turns from the cross-streets onto University Avenue. From the point of view

of a pedestrian walking along University Avenue, those additional turning movements reduce the ease with which they can cross the cross-streets as they proceed along University Avenue.

On the segment of University Avenue between Cowper Street and Woodland Avenue, the level of service for the bike mode is projected to decline from LOS C to LOS D in the PM peak hour under all four scenarios. This projected decline is consistent with the increase in vehicular volumes in 2030 under all scenarios, which is one of the factors used to determine the bicycle level of service.

The only segment of Park Boulevard which is projected to experience a decline for any of the modes is the segment between California Avenue and El Camino Real in one direction during the AM peak hour. On that segment, the bike mode is projected to decline from LOS A to LOS B under all four scenarios.

As noted above, because the MMLOS methodology was used to evaluate only University Avenue and Park Boulevard, this analysis does not address Palo Alto's larger network of bicycle and pedestrian facilities. All four scenarios assume that the city's Bicycle and Pedestrian Master Plan will be implemented, and the Comprehensive Plan itself also calls for upgrading the City's bicycle and pedestrian facilities to current accessibility and design standards. Therefore, all four scenarios may be said to have a beneficial impact on the City's network of bicycle and pedestrian facilities.

Table 17
AM and PM Peak Hour LOS Results for Two Multimodal Facilities

#	Facility Name	Between	Dir	Existing Conditions				2030 Scenario 1				2030 Scenario 2				2030 Scenario 3				2030 Scenario 4			
				Auto Mode	Ped Mode	Bike Mode	Transit Mode	Auto Mode	Ped Mode	Bike Mode	Transit Mode	Auto Mode	Ped Mode	Bike Mode	Transit Mode	Auto Mode	Ped Mode	Bike Mode	Transit Mode	Auto Mode	Ped Mode	Bike Mode	Transit Mode
<u>AM Conditions</u>																							
1	University Avenue ^{1 3}	High Street & Cowper Street	EB	D	B	D	N/A	D	B	D	N/A	D	B	D	N/A	D	B	D	N/A	D	B	D	N/A
			WB	D	A	D	N/A	D	B	D	N/A	D	B	D	N/A	D	B	D	N/A	D	B	D	N/A
2	University Avenue ²	Cowper Street & Woodland Avenue	EB	C	B	C	A	C	B	C	A	C	B	C	A	C	B	C	A	C	B	C	A
			WB	C	B	D	A	C	B	D	A	C	B	D	A	C	B	D	A	C	B	D	A
3	Park Boulevard ^{1 3}	Whitclm Drive & Charleston Road	NB	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A
			SB	A	A	C	N/A	A	A	C	N/A	A	A	C	N/A	A	A	C	N/A	A	A	C	N/A
4	Park Boulevard ^{1 3}	Charleston Road & Lambert Avenue	NB	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A
			SB	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A
5	Park Boulevard ³	Lambert Avenue & California Avenue	NB	B	A	C	N/A	B	A	C	N/A	B	A	C	N/A	B	A	C	N/A	B	A	C	N/A
			SB	B	A	C	N/A	B	A	C	N/A	B	A	C	N/A	B	A	C	N/A	B	A	C	N/A
4	Park Boulevard ³	California Avenue & El Camino Real	NB	B	A	A	N/A	B	A	B	N/A	B	A	B	N/A	B	A	B	N/A	B	A	B	N/A
			SB	A	A	B	N/A	A	A	B	N/A	A	A	B	N/A	A	A	B	N/A	A	A	B	N/A
<u>PM Conditions</u>																							
1	University Avenue ^{1 3}	High Street & Cowper Street	EB	D	B	D	N/A	E	B	D	N/A	E	B	D	N/A	E	B	D	N/A	E	B	D	N/A
			WB	D	B	D	N/A	E	B	D	N/A	E	B	D	N/A	E	B	D	N/A	E	B	D	N/A
2	University Avenue ²	Cowper Street & Woodland Avenue	EB	C	B	C	A	C	B	C	A	C	B	C	A	C	B	C	A	C	B	C	A
			WB	C	B	C	A	C	B	D	A	C	B	D	A	C	B	D	A	C	B	D	A
3	Park Boulevard ^{1 3}	Whitclm Drive & Charleston Road	NB	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A
			SB	A	A	C	N/A	A	A	C	N/A	A	A	C	N/A	A	A	C	N/A	A	A	C	N/A
4	Park Boulevard ^{1 3}	Charleston Road & Lambert Avenue	NB	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A
			SB	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A	C	A	C	N/A
5	Park Boulevard ³	Lambert Avenue & California Avenue	NB	B	B	D	N/A	B	B	D	N/A	B	B	D	N/A	B	B	D	N/A	B	B	D	N/A
			SB	A	B	C	N/A	A	B	C	N/A	A	B	C	N/A	A	B	C	N/A	A	B	C	N/A
4	Park Boulevard ³	California Avenue & El Camino Real	NB	B	A	B	N/A	B	A	B	N/A	B	A	B	N/A	B	A	B	N/A	B	A	B	N/A
			SB	A	A	B	N/A	A	A	B	N/A	A	A	B	N/A	A	A	B	N/A	A	A	B	N/A
Note:																							
1 Bicycle Lanes are not present along the facility.																							
2 Bicycle Lanes are partially present along the facility.																							
3 No transit vehicles run along any portion of the facility.																							

Source: Hexagon Transportation Consultants, Inc., October 2015.

9. Comparative Summary of the Four Scenarios

Each of the four scenarios has different transportation-related outcomes, which are briefly summarized below. Table 18 presents some of the topics discussed in this TIA that have quantitative metrics associated with them and for which the evaluation showed differences among the four scenarios.

Table 18
Summary of Metrics

Comparative Metric	Existing Conditions	2030			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4
<u>Mode Share</u>					
% Drive Alone	61.5%	59.9%	60.0%	59.7%	58.5%
<u>Transit Use</u>					
Number of Transit Trips	29,494	44,503	41,659	43,820	51,975
<u>Vehicle Miles Travelled (VMT)</u>					
Total Palo Alto VMT	5,320,931	5,914,158	5,741,393	5,853,201	5,788,497
<u>VMT Per Capita</u>					
Palo Alto VMT per capita	33.0	32.5	32.3	32.1	30.9
<u>Intersection Level of Service</u>					
Number of Impacted Intersections		6	3	4	5

Source: Hexagon Transportation Consultants, Inc., October 2015.

Scenario 1, the Business As Usual scenario, results in the second highest mode share for drive-alone automobiles, the highest Vehicle Miles Traveled (VMT), and the highest number of intersections with a significant impact. These results are consistent with the fact that Scenario 1 has the second highest combined total of new housing units and new jobs, but includes no specific measures to shift those trips out of automobiles. Also, Scenario 1 does not include the costly improvements included in some of the other scenarios, such as grade separations on the expressways or constructing a trench for the Caltrain tracks, which mitigate impacts in some locations.

Scenario 2 has the lowest VMT of the four scenarios. Of the four scenarios, Scenario 2 results in the fewest number of impacted intersections, partly because it includes the least intense land use assumptions and partly because of the expressway improvements that are included for Page Mill Road and Foothill Expressway. However, because it includes few specific measures to shift trips out of automobiles, Scenario 2 has the highest auto mode share and the fewest trips by transit of the four scenarios.

Scenario 3 represents a middle ground in terms of land use assumptions, and also is the middle ground in terms of transportation outcomes. It is neither the highest nor the lowest in terms of any of the transportation metrics

examined. Under Scenario 3, there would be four impacted intersections, which is less than the Business As Usual scenario, partly because it assumes that a trench would be constructed for the Caltrain tracks, which mitigates one impacted study intersection.

Scenario 4, which has the most intense land use assumptions, attempts to mitigate some of the transportation outcomes of more housing units and jobs through policies that promote transit, bicycling, and walking. It succeeds by some metrics, in that it results in the lowest mode share for Drive-Alone Auto, the highest mode share for walking, and the most transit trips of the four scenarios. VMT is lower for Scenario 4 than the Business As Usual scenario, but not as low as Scenario 2. However, of the four scenarios, Scenario 4 results in five impacted intersections, indicating that the policies to promote alternative modes do not fully mitigate the additional vehicular trips generated by the additional number of housing units and jobs included in this scenario.

In terms of the potential CEQA impacts presented in the first chapter, the following summarizes the findings of this TIA. Would any of the four scenarios:

- Cause an intersection to drop below its level of service standard, or if it is already operating at a substandard level of service, deteriorate by more than a specified amount? Yes, all four scenarios would result in at least one impacted intersection during the AM or PM peak hour. Even with the implementation of additional TDM-related policies and other measures to mitigate those impacts, the intersection impacts would be significant and unavoidable at five of the six impacted intersections. At the intersection of Middlefield Road and Charleston Road, implementation of a TDM mitigation program would reduce the impact to a less-than-significant level. However, all scenarios would still result in a significant and unavoidable impact at at least one intersection.
- Cause a freeway segment or ramp to operate at LOS F or contribute traffic in excess of 1% of segment capacity to a freeway segment or ramp already operating at LOS F? Yes, all four scenarios would result in significant impacts on six freeway segments during the PM peak hour and on one freeway segment during both the AM and PM peak hours. With implementation of a TDM mitigation program and other measures, the projected impact would be eliminated on three freeway segments. The TDM measures would reduce but not eliminate the impact on four of the freeway segments. These impacts are considered significant and unavoidable. None of the scenarios would cause an impact on any of the freeway ramps.
- Impede the development or function of planned pedestrian or bicycle facilities? No. Scenario 2 includes the expansion of Page Mill Road from four to six lanes between I-280 and Porter Drive, and wider roadways can generally be considered detrimental to pedestrians. However, Scenario 2 also includes construction of improved bicycle and pedestrian facilities along that segment of Page Mill Road. There are currently no pedestrian facilities at all between I-280 and Deer Creek Road. Thus, on balance, that scenario would enhance rather than degrade the bicycle and pedestrian facilities. None of the other scenarios include components that would impede the function of planned bicycle or pedestrian facilities.
- Increase demand for pedestrian and bicycle facilities that cannot be met by existing or planned facilities? No.
- Impedes the operation of a transit system as a result of congestion? Yes, but with implementation of additional TDM policies, and signal priority for buses at intersections and queue jump lanes and curbside platforms along El Camino Real, this impact would be reduced. However, because the congestion at all intersections and roadway segments where buses operate would not be eliminated, all four scenarios would have a significant and unavoidable impact on transit operations by increasing congestion.
- Create demand for transit services that cannot be met by current or planned services? No.
- Create the potential demand for through traffic to use local residential streets? Yes, all four scenarios would result in additional traffic on arterials which could result in additional traffic being diverted from those arterials onto local residential streets. As mitigation for potential cut-through impacts, the City would adopt a traffic calming program. With implementation of a traffic calming program, it can be assumed that any impacts to local residential streets from traffic that may be diverted from arterials could be reduced to less than significant.

- Create an operational safety hazard? No.
- Result in inadequate emergency access? No.

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