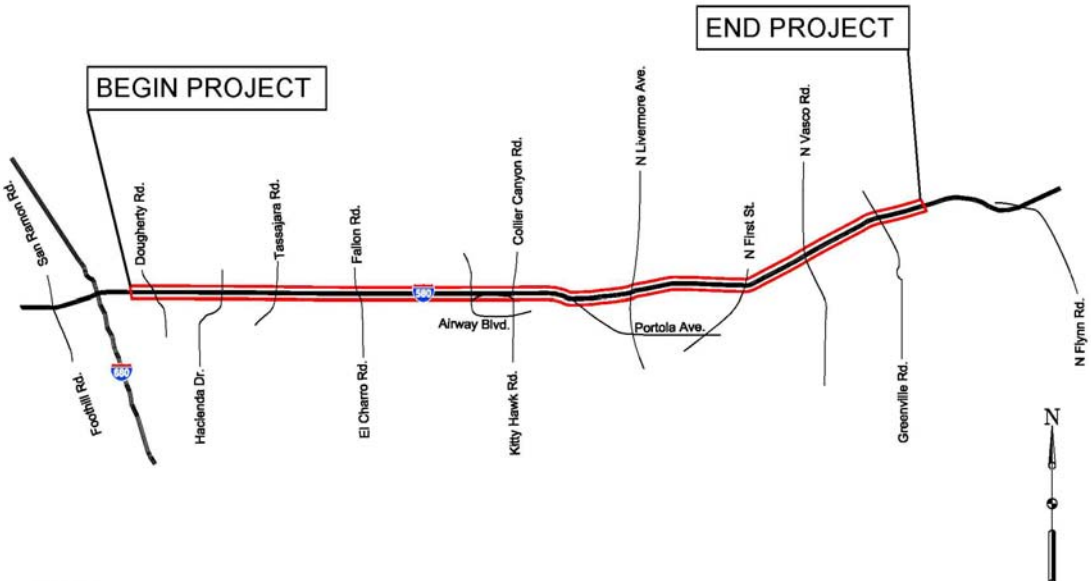
I-580 Eastbound Express Lanes Project

ALAMEDA COUNTY, CALIFORNIA
DISTRICT 4 – ALA – 580 (PM R7.8/19.9)
04-0G1900/0400000315

Initial Study with Negative Declaration/Environmental Assessment with Finding of No Significant Impact



Prepared by the
State of California Department of Transportation
in Cooperation with Alameda County Transportation Commission

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 USC 327.

March 2014

General Information about This Document

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SCH: 2014012008
4-ALA-580-PM R7.8/19.9
Caltrans EA No. 04-0G1900
Project No. 0400000315

Construct express lane facility on eastbound Interstate 580, from west of the Hopyard Road/Dougherty Road overcrossing to east of the Greenville Road undercrossing (Post Miles R7.8 to 19.9).

Initial Study with Negative Declaration/Environmental Assessment with Finding of No Significant Impact

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C)

THE STATE OF CALIFORNIA
Department of Transportation

Cooperating Agencies:
Alameda County Transportation Commission

3-18-14
Date of Approval

Bijan Sartipi
District Director
California Department of Transportation, District 4
NEPA and CEQA Lead Agency

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CALIFORNIA DEPARTMENT OF TRANSPORTATION
FINDING OF NO SIGNIFICANT IMPACT

FOR THE

I-580 EASTBOUND EXPRESS LANES PROJECT

The California Department of Transportation (Department) has determined that the Build Alternative will have no significant impact on the human environment. This FONSI is based on the attached EA and supporting technical reports, which have been independently evaluated by the Department and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required. The Department takes full responsibility for the accuracy, scope, and content of the attached EA.

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by the Department under its assumption of responsibility pursuant to 23 U.S.C. 327.

3-18-14
Date

BIJAN SARTIPI
District Director
California Department of Transportation, District 4

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SCH: 2014012008

Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Department), in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes to convert the existing I-580 eastbound high-occupancy vehicle (HOV) lane to an express lane facility. The conversion would allow single-occupant vehicles (SOVs) to pay a toll to use the lanes. HOVs would continue to use the lanes for free. The project limits extend from just west of the Hopyard Road/Dougherty Road overcrossing to just east of the Greenville Road undercrossing in the cities of Dublin, Pleasanton, and Livermore in Alameda County (Post Miles R7.8/19.9). A second express lane would be provided from the Fallon Road/El Charro Road interchange to the North First Street interchange. The total length of the project is approximately 12.1 miles.

Determination

This Negative Declaration (ND) is included to give notice to interested agencies and the public that it is the Department's intent to adopt an ND for this project. This does not mean that the Department's decision regarding the project is final. This ND is subject to change based on comments received by interested agencies and the public.

The Department has prepared an Initial Study for this project, and following public review, has determined from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The project would have no effect on agricultural and forest resources, biological resources, geology and soils, hydrology and water quality, land use and planning, mineral resources, population and housing, public services, recreation, or utilities and service systems.

In addition, the project would have no significant effect on aesthetics, air quality, cultural resources (including paleontology), hazards and hazardous materials, noise, or transportation/traffic.

B. Bijan Sartipi — 3-18-14

Bijan Sartipi
District Director
California Department of Transportation, District 4

Date of Approval

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Summary

The California Department of Transportation (Department), in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes to convert the existing Interstate 580 (I-580) eastbound high-occupancy vehicle (HOV) lane to an express lane facility. The conversion would allow single-occupant vehicles (SOVs) to pay a toll to use the lanes. HOVs would continue to use the lanes for free. The project limits extend from just west of the Hopyard Road/Dougherty Road overcrossing to just east of the Greenville Road undercrossing in the cities of Dublin, Pleasanton, and Livermore in Alameda County (Post Miles R7.8 to 19.9). A second express lane would be provided from the Fallon Road/El Charro Road interchange to the North First Street interchange. The total length of the project is approximately 12.1 miles.

The Department is the lead agency under the National Environmental Policy Act (NEPA), effective July 1, 2007, pursuant to 23 United States Code (USC) 327. The Department is the lead California Environmental Quality Act (CEQA) agency for the project. The project is proposed in cooperation with the Alameda CTC, which is responsible for providing regional funding.

The purpose of the project is to provide additional congestion relief, provide enhanced operational and safety improvements, expand the available freeway capacity for HOVs, expand the mobility options in this congested corridor, and maintain consistency with provisions defined in Assembly Bill 2032 (2004) and Assembly Bill 574 (2007) to implement express lanes in an HOV system in Alameda County. The project is needed to address congestion within the I-580 corridor, which serves the communities of Dublin, Pleasanton and Livermore as well as the Central Valley region.

The project would not require any acquisition of right-of-way. The existing HOV lane would be converted to an express lane facility by eliminating the existing striping, delineating travel lanes, and restriping the roadway. Signs, toll structures, lighting, and utility equipment would be installed.

This Initial Study/Environmental Assessment (IS/EA) addresses the proposed project's potential to have adverse impacts on the environment. Potential impacts and avoidance, minimization, and mitigation measures are summarized in Table S-1.

Table S-1: Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential Impact		Avoidance, Minimization, and/or Mitigation Measures
	No Build Alternative	Build Alternative	
Land Use	None.	None. The project would not change or conflict with existing land use designations or affect parkland.	None required.
Growth	None.	None. The project would not induce new growth, substantially change roadway capacity, or serve any new areas not already accessible by existing interchanges.	None required.

Table S-1: Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential Impact		Avoidance, Minimization, and/or Mitigation Measures
	No Build Alternative	Build Alternative	
Farmlands/ Timberlands	None.	None. The project would not convert or conflict with zoning for farmlands or timberlands.	None required.
Community Impacts: Community Character and Cohesion	None.	None. The project would not displace or relocate any residents, change any existing community boundaries, physically divide an established community, or create a new barrier to movement within the project area.	None required.
Community Impacts: Relocations and Real Property Acquisition	None.	None. The project would not require any relocations or property acquisition.	None required.
Community Impacts: Environmental Justice	None.	None. The project would not cause disproportionately high and adverse effects on any minority or low-income populations.	None required.
Utilities/ Emergency Services	None.	Utility work could result in temporary lane closures. Emergency services access would be maintained throughout project construction.	The project's Traffic Management Plan (TMP) will address temporary lane closures during construction. No further avoidance, minimization, or mitigation is needed.
Traffic and Transportation/ Pedestrian and Bicycle Facilities	In 2015, the eastbound general purpose lanes would operate at acceptable levels of service (LOS), but three HOV lane segments are forecast to operate at unacceptable LOS E or F. In 2035, four general purpose lane segments and three HOV lane segments would operate at LOS E or F.	In 2015, all general purpose and express lane segments would operate at acceptable LOS C or better, and some segments would improve slightly compared to No Build. In 2035, all express lane segments would have acceptable LOS, and one general purpose lane would operate at LOS E. Operations in approximately half of all segments would improve compared to No Build. The project would not affect any pedestrian or bicycle facilities.	The project's Traffic Management Plan (TMP) will address temporary lane closures during construction. No further avoidance, minimization, or mitigation is needed.

Table S-1: Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential Impact		Avoidance, Minimization, and/or Mitigation Measures
	No Build Alternative	Build Alternative	
Visual/Aesthetics	None.	Changes to eastbound I-580 from installation of signs, toll structures, and lighting would be visually compatible with the existing freeway setting. The project would not have substantial adverse effects on a state scenic highway or scenic vista. Project lighting would not result in light or glare impacts.	If construction operations or staging causes the death or removal of existing vegetation, replacement may be required in accordance with Caltrans policy.
Cultural Resources	None.	No known archaeological or historical resources have been identified in the project's Area of Potential Effects. Project construction would involve minimal subsurface disturbance in native soils. The potential to disturb buried deposits would be extremely low.	If cultural materials are discovered during construction, earth-moving activities will be diverted until an archaeologist can assess the find. If human remains are discovered, the procedures described in State law will be implemented.
Hydrology and Floodplain	None.	None. The project would not add any impervious surface and would require minimal ground disturbance.	None required.
Water Quality and Storm Water Runoff	None.	None. The project would not increase impervious surface area, or result in any changes that would increase sediment or pollutant loads in storm water runoff.	None required.
Geology/Soils/ Seismicity/ Topography	None.	None. The only structures that would be added are for signs, tolling equipment, lighting, and utility cabinets. Geotechnical considerations within the project area would be addressed with standard department design and construction techniques.	None required.
Paleontology	None.	Installation of overhead or roadside signs, toll structures, and light standards could encounter high-sensitivity geologic units. These geologic units have been documented to contain sensitive paleontological resources in Livermore and other parts of Alameda County.	The project would implement resource stewardship measures to allow for monitoring during construction within soils that have high paleontological sensitivity and recovery of fossil remains and other specimen and geologic data, if found, in accordance with a Paleontological Mitigation Plan.

Table S-1: Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential Impact		Avoidance, Minimization, and/or Mitigation Measures
	No Build Alternative	Build Alternative	
Hazardous Waste/ Materials	None.	The project would not affect any hazardous materials sites. Roadway striping that would be removed for the project is not expected to contain lead and would not expose workers or the public to airborne contaminants. Soil disturbance for trenching, foundation installation, and utility work has the potential to expose workers to aerially deposited lead (ADL).	Excavated soil that cannot be used as fill would be dispersed on site as directed in the Standard Specifications and Special Provisions or removed by the contractor. Best Management Practices would be used during construction if unknown hazardous materials are encountered or materials are accidentally spilled.
Air Quality	None.	The project would not increase concentrations of criteria pollutants that would result in air quality standard violations. The project would not result in new or continued violations of standards for particulate matter less than 2.5 micrograms in diameter ($PM_{2.5}$). Minor increases in mobile source air toxics in the project opening year (2015) and horizon year (2035) would be offset by emissions improvements from national control programs. Construction-related impacts would be less than significant because of the limited scope and duration of construction and the use of standard control measures.	Implementation of the Department's Special Provisions, Standard Specifications, and other recommended measures listed in Section 2.2.3.4 would minimize or eliminate dust from construction activities.
Noise	None.	Depending on location, the project would have no effect on existing noise levels, or no more than a 2 decibel increase. Construction noise would be temporary, limited in duration, and generally at or below the existing freeway noise levels. A traffic noise abatement evaluation following Department procedures identified feasible sound walls, but none were determined cost-effective.	Measures would be implemented to minimize or reduce the potential for temporary noise impacts resulting from project construction. The final decision regarding noise abatement will be made following completion of the project design and public involvement process.

Table S-1: Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential Impact		Avoidance, Minimization, and/or Mitigation Measures
	No Build Alternative	Build Alternative	
Biological Environment: Natural Communities	None.	Project activities in sensitive natural communities will be completed as part of construction of the I-580 Eastbound HOV Lane Project phases (EAs 29083_, 29084_ and 2908V_). No additional impacts will occur because the remaining project activities will be limited to areas that do not support sensitive natural communities.	Project activities in sensitive natural communities will be restricted to the construction period and work areas for I-580 Eastbound HOV Lane Project phases. Project activities will adhere to the conservation measures set forth in Appendix D, Part D2. In addition, shades and deflectors will be installed on roadway lighting to avoid casting light past the outside edge of pavement and into sensitive natural communities.
Biological Environment: Wetlands and Other Waters	None.	None. The project does not include any work within drainages.	None required.
Biological Environment: Plant Species	None.	Project activities in habitat for special-status plants will be completed as part of construction of the I-580 Eastbound HOV Lane Project phases (EAs 29083_, 29084_ and 2908V_). No additional impacts will occur because the remaining project activities will be limited to areas that do not support habitat for special-status plants.	Project activities in areas with habitat for special-status plants will be restricted to the construction period and work areas for the I-580 Eastbound HOV Lane Project phases. Project activities will adhere to the conservation measures set forth in Appendix D, Part D2.
Biological Environment: Animal Species	None.	Project activities in habitat for special-status animals will be completed as part of construction of the I-580 Eastbound HOV Lane Project phases (EAs 29083_, 29084_ and 2908V_). No additional impacts will occur because the remaining project activities will be limited to areas that do not support habitat for special-status animals.	Project activities in areas with habitat for special-status animals will be restricted to the construction period and work areas for the I-580 Eastbound HOV Lane Project phases. Project activities will adhere to the conservation measures set forth in Appendix D, Part D2. In addition, shades and deflectors will be installed on roadway lighting to avoid casting light past the outside edge of pavement and into habitat for special-status animals.

Table S-1: Summary of Impacts and Avoidance, Minimization, and/or Mitigation Measures

Affected Resource	Potential Impact		Avoidance, Minimization, and/or Mitigation Measures
	No Build Alternative	Build Alternative	
Biological Environment: Threatened and Endangered Species	None.	Project activities in habitat for threatened or endangered species will be completed as part of construction of the I-580 Eastbound HOV Lane Project phases (EAs 29083_, 29084_ and 2908V_). No additional impacts will occur because the remaining project activities will be limited to areas that do not support habitat for threatened or endangered species.	Project activities in areas with habitat for threatened or endangered species will be restricted to the construction period and work areas for the I-580 Eastbound HOV Lane Project phases. Project activities will adhere to the conservation measures set forth in Appendix D, Part D2. In addition, shades and deflectors will be installed on roadway lighting to avoid casting light past the outside edge of pavement and into habitat for threatened or endangered species.
Biological Environment: Invasive Species	None.	None. All project activities would be restricted to the paved roadway surface or areas immediately adjacent to the roadway that have been previously disturbed by construction. No landscaping or importation of soil would occur.	None required.
Cumulative Impacts	None.	Proposed development is assumed in the traffic, air quality, and noise analyses performed for the proposed project. No cumulative impacts are anticipated for land use, community resources, growth, or utilities and emergency services. No substantial adverse cumulative impacts are expected from traffic and transportation/pedestrian and bicycle facilities, visual/aesthetics, air quality, or noise.	None required.

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Chapter 1 Proposed Project

The California Department of Transportation (Department), in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes to convert the existing Interstate 580 (I-580) eastbound high-occupancy vehicle (HOV) lane to an express lane facility. The conversion would allow single-occupant vehicles (SOVs) to pay a toll to use the lanes. HOVs would continue to use the lanes for free. The I-580 Eastbound Express Lanes Project (project) limits extend from just west of the Hopyard Road/Dougherty Road overcrossing to just east of the Greenville Road undercrossing in the cities of Dublin, Pleasanton, and Livermore in Alameda County (Post Miles R7.8 to 19.9). A second express lane would be provided from the Fallon Road/El Charro Road interchange to the North First Street interchange. The total length of the project is approximately 12.1 miles. Figures 1.1-1 and 1.1-2 show the project location and vicinity.

The Department is the lead agency under the National Environmental Policy Act (NEPA), effective July 1, 2007, pursuant to 23 United States Code (USC) 327. The Department is the lead agency under the California Environmental Quality Act (CEQA).

This project is included in the 2013 Metropolitan Transportation Commission's (MTC) 2040 Regional Transportation Plan (RTP; MTC reference #240050) and the MTC's 2013 Transportation Improvement Plan (TIP; ID #ALA070020).

1.1 Location and Background

I-580 is the main east-west interregional freeway connecting the Bay Area and the Central Valley. I-580 also serves as a major commute corridor between the Central Valley (Tracy, Stockton, and the Interstate 5 [I-5] corridor) and the Bay Area. Additionally, I-580 is a major route for the movement of goods and freight into and out of the region, as well as for recreational travel throughout the year. The freeway is classified as a "Lifeline Route," facilitating movement between major staging areas and impacted areas following major earthquakes. I-580 is the main access route to the Homeland Security Organization at Lawrence Livermore National Laboratory, just south of the eastern project limit.

California State Assembly Bill 2032 (AB 2032; approved September 9, 2004) authorizes the Alameda CTC to conduct, administer, and operate a value pricing and transit development pilot program on up to two corridors under Alameda CTC jurisdiction in Alameda County. The pilot program allows for single-occupant vehicles to use excess capacity in designated HOV lanes at certain times of the day by paying a toll. HOV lanes used for this purpose are known as express lanes or high-occupancy toll (HOT) lanes. HOV users are not subject to tolls. The use of toll revenues is limited to operating and maintaining the express lane facility, providing additional HOV facilities in the corridor, and improving transit operations serving the corridor. AB 2032 originally included a sunset provision that authorized the pilot program to operate for a period not to exceed 4 years after the agency first collects revenues. California State Assembly Bill 574 (AB 574; approved October 11, 2007) eliminated the sunset provision in AB 2032 (California Streets and Highways Code Section 149.5). In November 2005, the Alameda CTC Board designated the I-580 corridor in the Livermore Valley as a potential express lane facility.

The proposed project is part of the initial group of Bay Area express lanes authorized under Assembly Bills 2032 and 574. The first express lane opened on southbound I-680 over the

Sunol Grade in 2010. Express lanes are also being planned for westbound I-580 and northbound I-680 in Alameda County, and State Route 85 and U.S. Highway 101 in Santa Clara County and portions of San Mateo County. In October 2011, the California Transportation Commission (CTC) authorized an MTC plan to develop an additional 290 miles of express lanes in Alameda, Contra Costa, and Solano counties.

The proposed project is one of several transportation improvements envisioned for the I-580, State Route 84 (SR 84), and Interstate 680 (I-680) corridors in the Tri-Valley Transportation Plan and Action Plan Update (DKS 2009). The improvements are being constructed in increments as funding allows. The following describes the sequence of completed and planned improvements in the project corridor.

Eastbound I-580 in the project limits has four general purpose lanes (lanes that are open to all vehicles) and one HOV lane. The HOV lane has been built in three phases, collectively known as the I-580 Eastbound HOV Lane Project (Department 2007a, 2008a, 2009a, 2011a):

- Phase I (EA 04-290844) opened to traffic in October 2009. The improvements included mainline widening and ramp modifications to allow the addition of an eastbound HOV lane between Portola Avenue and Greenville Road. The widening included an additional 8 feet to accommodate the planned conversion of the HOV lane to an express lane.

- Phase II (EA 04-290834) opened to traffic in November 2010. The improvements included mainline widening and ramp modifications to allow the addition of an eastbound HOV lane between Hacienda Drive and Portola Avenue. As with Phase I, the widening included an additional 8 feet to accommodate the conversion of the HOV lane to an express lane.

- Phase III (EA 04-2908U1) will construct auxiliary lanes (lanes that extend from on-ramps to off-ramps) on eastbound I-580 between the Isabel Avenue interchange and the North Livermore Avenue interchange, and between the North Livermore Avenue interchange and the North First Street interchange. Phase III will also widen the freeway segments within the auxiliary lane limits, at the Hacienda Drive on-ramp to eastbound I-580, and between the Santa Rita Road and Fallon Road interchanges to accommodate the express lanes. Construction of Phase III is in progress and is anticipated to be completed in late 2014.

1.2 Purpose and Need

1.2.1 Purpose of the Project

The purpose of the project is to:

- Provide additional congestion relief;

- Provide enhanced operational and safety improvements;

- Expand the available capacity for HOVs;

- Expand the mobility options in this congested corridor; and

- Maintain consistency with provisions defined in Assembly Bill 2032 (2004) and Assembly Bill 574 (2007) to implement express lanes in an HOV system in Alameda County.

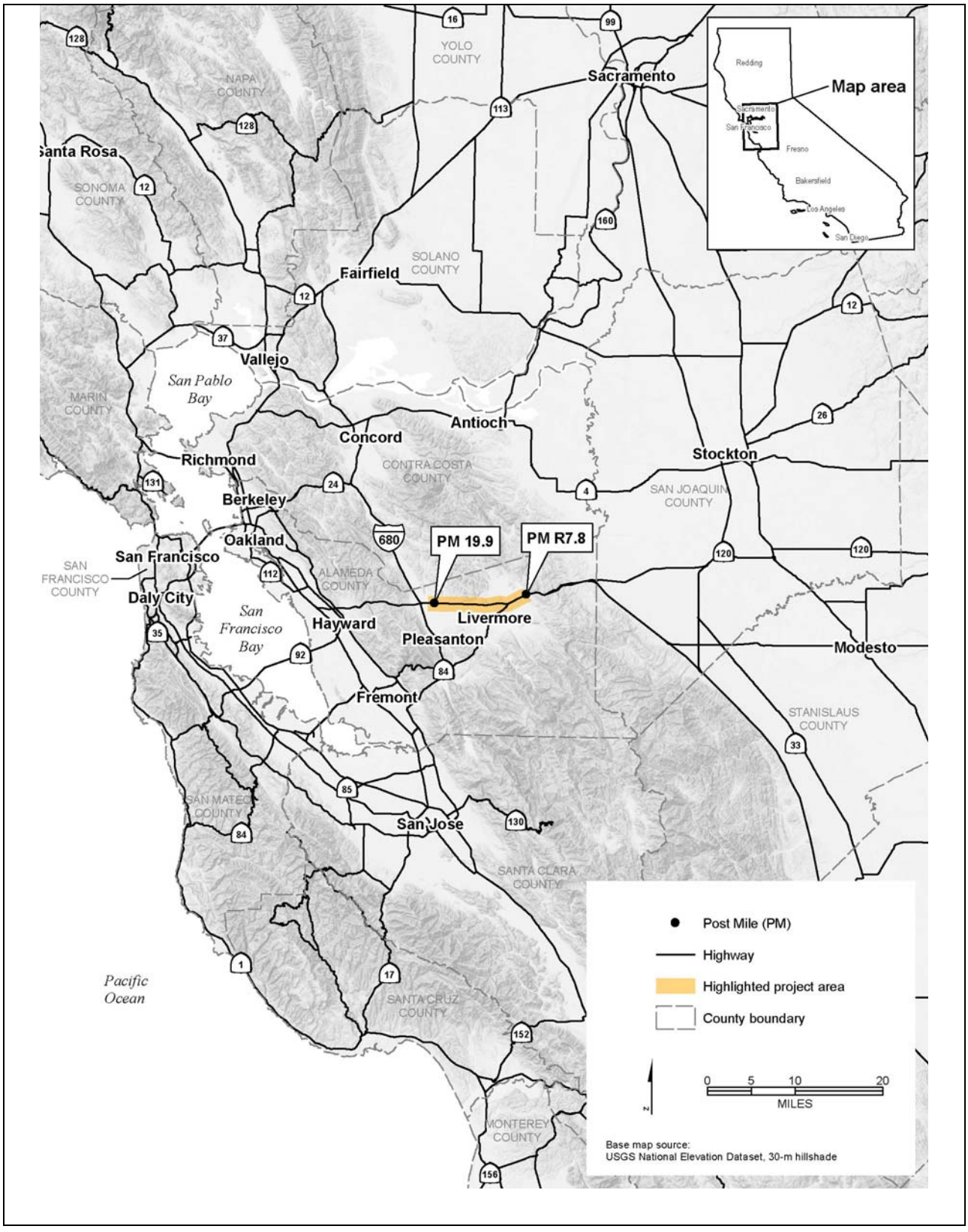

Figure 1.1-1. Project Location

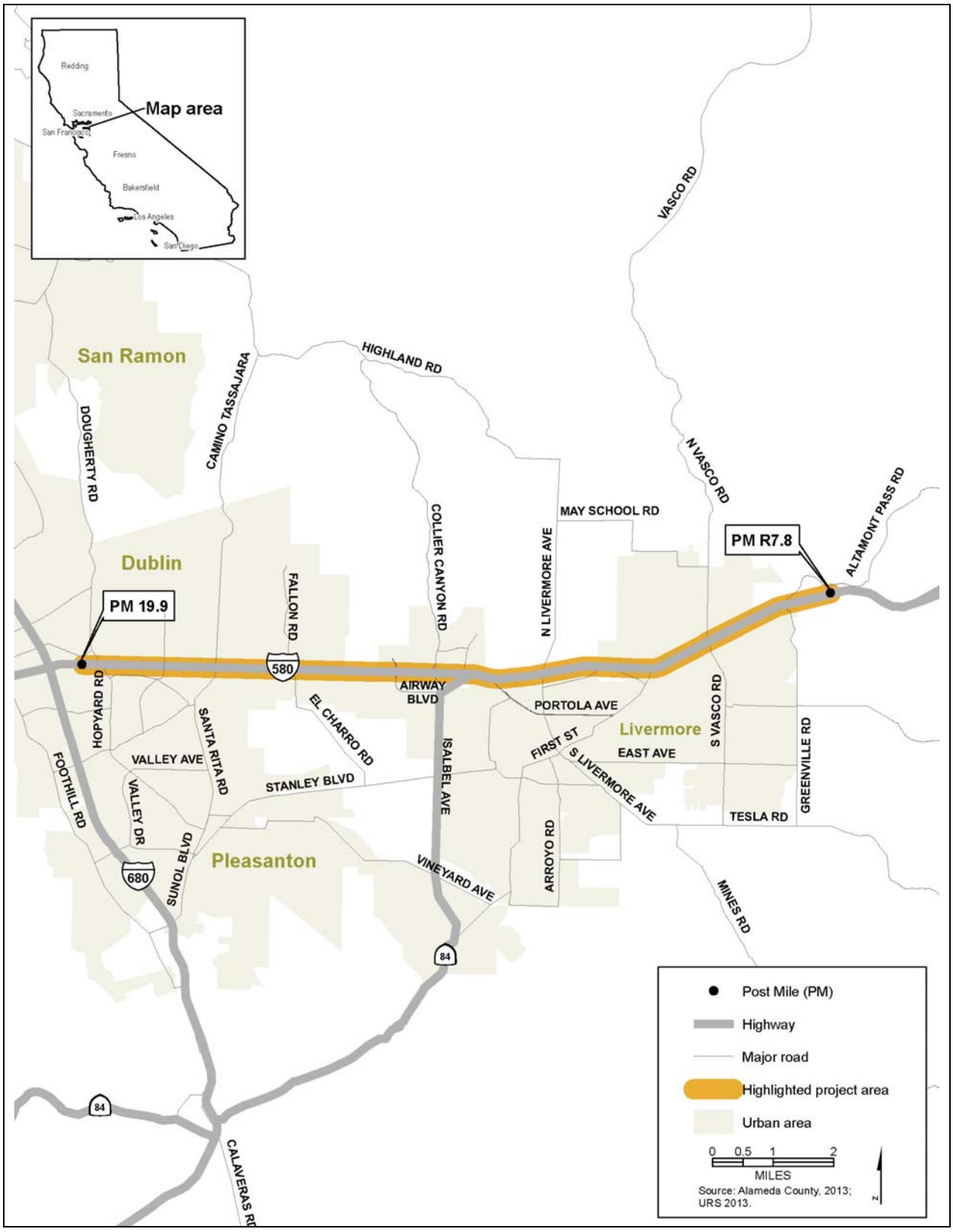

Figure 1.1-2. Project Vicinity

1.2.2 Project Need

1.2.2.1 Capacity and Transportation Demand

Alameda County has the most traffic congestion of the nine Bay Area counties (Department 2011b). More than 200,000 vehicles, including 13,000 trucks carrying goods to and from the Central Valley, use I-580 in the project area every day (Department 2009b, 2010). The I-580 corridor has the second-highest volume of truck traffic in the region (after I-880) and serves a growing number of regional distribution centers in the San Joaquin Valley (Department 2010). According to a 2008 regional congestion study from the Department and MTC, drivers on eastbound I-580 experience a combined 5,250 daily vehicle hours of delay, and the freeway is ranked the third most congested in the San Francisco Bay Area (MTC 2009).

The peak travel period in the eastbound direction of I-580 is the afternoon/evening. Since the HOV lane between Hacienda Drive and Greenville Road opened in 2009–2010, congestion during the PM peak has decreased (Department 2011b). An average of 752 vehicles per hour (vph) use the HOV lane, representing about 13.5 percent of all eastbound vehicles in that segment (Department 2012). Travelers in the HOV lane average PM peak speeds of 65 miles per hour (mph), compared with 47 mph in the general purpose lanes (Department 2012).

Although congestion in the HOV lane and other projects along eastbound I-580 has decreased, traffic conditions along the corridor are forecasted to deteriorate after 2015 if no additional capacity or traffic management improvements are implemented. Data from the Department's Performance Measurement System and other sources indicate that Bay Area congestion will increase by a minimum of about 50 percent in the next 20 to 25 years (Department 2011b). MTC travel projections show that commutes to and from the Bay Area will nearly double over the next 20 years, and one of the largest increases will be from the Central Valley via San Joaquin, Stanislaus, and Merced counties (Department 2010), for which I-580 is a primary travel route.

In the existing I-580 eastbound HOV lane, volumes are expected to increase to about 1,700 vph in 2035 (Department 2011b, p.22). As the capacity of an HOV lane is generally understood to be 1,600 vph (Department 2011b), the projected 2035 volume for the I-580 eastbound HOV lane indicates substantial congestion and delay. Overall, the 2035 demand is forecasted to exceed capacity for eastbound I-580 even with the HOV lane and ramp metering (Department 2010).

Traffic congestion on I-580 also causes spillover effects on adjacent arterials and surface streets as motorists seek to bypass the congested interstate. Daily vehicle hours of delay on surface streets that feed I-580 and adjacent parallel arterials (such as Hopyard Road and Owens Drive, Airway Boulevard and North Canyon Parkway, and North Livermore Avenue) are forecasted to increase marginally or even decrease in 2015 due to roadway network improvements; however, by 2035, severe congestion is forecasted to occur given no additional improvements (Department 2010).

Capital improvement projects that involve purchasing right-of-way and adding capacity to existing freeways have become difficult to deliver with the current economic and funding conditions. Expanding existing freeways can also have a wide range of adverse environmental

impacts, including to surrounding communities and land owners. Accordingly, the MTC has called for a regional network of express lanes, with the following goals:

- Connectivity – Use express lane toll revenue to close gaps within the HOV lane system and to increase travel-time savings for carpools and buses. Without express lane toll revenue, the region's HOV system will remain fragmented for the foreseeable future.
- Efficiency – Optimize throughput on freeway corridors to better meet current and future traffic demands, using excess capacity in the existing HOV system to reduce travel time for all travelers.
- Reliability – Provide a reliable, congestion-free transportation option (ABAG and MTC 2013a).

1.2.2.2 Safety

Data from the Department's Traffic Accident Surveillance and Analysis System (TASAS) show that the accident rate on I-580 eastbound from east of Greenville Road to west of Hacienda Drive is higher than the statewide average; from west of Hacienda Drive to San Ramon Road (which is west of the project limits), the accident rate is lower than the statewide average (Table 1.2.2-1). Most of the accidents along I-580 in the project limits are associated with congested conditions. Of the accidents reported, 30.0 percent involved stopped vehicles, 27.4 percent involved slowing or stopping vehicles, and 22.3 percent were associated with lane changes. More than half of the accidents (59.8 percent) were rear-end collisions, which are also associated with traffic congestion. Fifty-seven percent of the accidents occurred during the afternoon peak period, 3 PM to 6 PM.

Table 1.2.2-1 Eastbound I-580 Mainline and Ramp Accident Rates

Post Mile	Description	No. of Accidents			MVM	Actual Accident Rate (Accs/MVM)			Average Statewide Accident Rate (Accs/MVM)		
		Total	F	I		F	F+I	Total	F	F+I	Total
	Mainline										
R7.8 to 19.1	East of Greenville Road Overhead to West of Hacienda Drive	872	2	297	1055.78	0.002	0.28	**0.83**	0.004	0.25	0.81
19.1 to R21.4	West of Hacienda Drive to San Ramon Road Overhead	179	0	45	237.72	0	0.19	0.75	0.004	0.28	0.90
	Ramps										
8.5	EB on-ramp from Greenville Rd	0	0	0	3.89	0	0	0	0.001	0.13	0.46
8.7	EB off-ramp to Greenville Rd	2	0	0	3.47	0	0	0.58	0.003	0.24	0.84
9.0	EB on-ramp from truck scales	0	0	0	2.63	0	0	0	0.002	0.06	0.61
9.2	EB off-ramp to truck scales	0	0	0	2.41	0	0	0	0.002	0.05	0.49
9.5	EB on-ramp from Vasco Rd	5	0	2	5.40	0	0.37	**0.93**	0.002	0.22	0.63
9.8	EB off-ramp to NB Vasco Rd	3	0	1	12.81	0	0.08	0.23	0.003	0.30	1.06

Table 1.2.2-1 Eastbound I-580 Mainline and Ramp Accident Rates, continued

Post Mile	Description	No. of Accidents			MVM	Actual Accident Rate (Accs/MVM)			Average Statewide Accident Rate (Accs/MVM)		
		Total	F	I		F	F+I	Total	F	F+I	Total
9.8	EB off-ramp to SB Vasco Rd	2	0	2	8.03	0	0.25	0.25	0.004	0.24	0.75
9.9	EB off-ramp to NB/SB Vasco Rd	0	0	0	19.53	0	0	0	0.002	0.08	0.25
10.6	EB on-ramp from First St	8	0	2	10.11	0	0.20	**0.79**	0.002	0.22	0.63
10.7	EB off-ramp to NB First St	2	0	0	3.89	0	0	0.52	0.003	0.30	1.06
10.7	EB off-ramp to SB First St	7	0	1	2.46	0	0.41	**2.84**	0.004	0.24	0.75
10.9	EB off-ramp to NB/SB First St	1	0	0	7.37	0	0	0.14	0.002	0.08	0.25
12.4	EB on-ramp from N. Livermore Ave	2	0	0	6.53	0	0	0.31	0.002	0.22	0.63
12.7	EB off-ramp to N. Livermore Ave	13	0	5	10.22	0	0.49	**1.27**	0.003	0.35	1.01
13.3	EB off-ramp to Portola Ave	1	0	0	9.09	0	0	0.11	0.004	0.24	0.75
15.0	EB on-ramp from Airway Blvd	3	0	1	8.25	0	0.12	0.36	0.002	0.23	0.64
15.2	EB off-ramp to Airway Blvd	9	0	4	16.21	0	0.25	0.56	0.001	0.25	0.76
16.5	EB on-ramp from Fallon Rd	0	0	0	1.97	0	0	0	0.002	0.22	0.63
16.9	EB off-ramp to Fallon Rd	1	0	0	2.74	0	0	0.37	0.003	0.35	1.01
17.7	EB on-ramp from NB Santa Rita Rd	5	0	1	7.30	0	0.14	**0.69**	0.003	0.18	0.57
17.9	EB on-ramp from SB Santa Rita Rd	4	0	3	4.80	0	0.63	**0.83**	0.002	0.21	0.73
18.1	EB off-ramp to Santa Rita Rd	5	0	2	18.10	0	0.11	0.28	0.003	0.35	1.01
18.7	EB on-ramp from NB Hacienda Dr	4	0	3	3.98	0	0.75	**1.01**	0.003	0.18	0.57
18.9	EB on-ramp from SB Hacienda Dr	2	0	1	4.98	0	0.20	0.40	0.002	0.21	0.73
19.1	EB off-ramp to Hacienda Dr	15	0	8	19.46	0	0.41	0.77	0.003	0.35	1.01
19.7	EB on-ramp from NB Hopyard Rd	3	0	2	5.68	0	0.35	0.53	0.003	0.18	0.57
19.9	EB on-ramp from SB Hopyard Rd	5	0	0	5.95	0	0	**0.84**	0.002	0.21	0.73
20.2	EB on-ramp from NB I-680	2	0	1	27.05	0	0.04	0.07	0.003	0.14	0.41
20.3	EB on-ramp from SB I-680	0	0	0	23.43	0	0	0	0.003	0.14	0.41
20.6	EB off-ramp to Hopyard Rd	3	0	2	10.59	0	0.19	0.28	0.005	0.13	0.38
20.9	EB off-ramp to NB I-680	7	0	2	16.72	0	0.12	0.42	0.004	0.20	0.68
20.9	EB off-ramp to SB I-680	6	0	3	8.18	0	0.37	**0.73**	0.005	0.13	0.38
21.0	EB off-ramp to I-680	0	0	0	26.17	0	0	0	0.002	0.08	0.25

Note: **Bold underlined numbers** reflect actual accident rate that are higher than the statewide average.
Key: F = Fatal; I = Injury; MVM = Million Vehicles Miles
Source: Caltrans TASAS Data for I-580 from east of Greenville Road Overhead to San Ramon Road, Post Mile R7.9 to 21.4, January 1, 2009 through December 31, 2011.

1.2.2.3 Legislation

As described in Section 1.1, California Streets and Highways Code Section 149.5 allows for permanent implementation of a value pricing program within any two corridors in the Alameda County HOV lane system. The enabling legislation stipulates that revenue collected from the express lanes will support transportation improvements and transit projects within the corridor.

USC Title 23, Section 166(d)(2) set a minimum average operating speed of 45 miles per hour (mph) for HOV lanes with a speed limit of 50 mph or higher, which generally corresponds to a Level of Service (LOS) C or D.[1] LOS D operating conditions in the HOV lane are only allowed with written approval of the Department (California Streets and Highways Code Section 149.5[b]). These requirements are intended to provide HOVs with reliable travel times.

1.2.2.4 Modal Interrelationships and System Linkages

I-580 is the primary east-west route connecting the Bay Area with residential areas in the Tri-Valley[2] and San Joaquin County as well as commerce in the Central Valley and Southern California. In the project area, I-580 connects with I-680 and SR 84; outside of the project limits and to the east, I-580 connects with I-205 (approximately 8 miles east of Greenville Road) and I-5 (approximately 25 miles to the southeast of Greenville Road). With its connections to I-5, I-580 is a major gateway for goods movement into and out of the Bay Area's five seaports (including the Port of Oakland), three commercial airports, and four rail freight terminals, as well as one of the primary routes for eastbound travelers destined for the Sierra Nevadas and Southern California (Department 2010).

I-580 also serves as a significant regional and interregional commuter route. Both express commuter services connecting the Central Valley to the Bay Area (San Joaquin Regional Transit District, Modesto Area Express, and Amtrak Thruway Motorcoach) and local transit services providing connections within the Tri-Valley region (Tri-Delta Transit, Livermore Amador Valley Transit Authority, and Contra Costa County Connection) use I-580 as part of their routes. I-580 also provides access to the Bay Area Rapid Transit (BART) Dublin/Pleasanton Station, which is in the freeway median within the project limits; and Altamont Commuter Express (ACE), which has two stations in Livermore and one in Pleasanton, all outside of the project limits. Detailed environmental analysis is under way for a future eastward extension of BART.

Four Park and Ride lots along I-580 in the project vicinity allow solo drivers to transfer to a local or regional transit bus, carpool, or vanpool. Three lots are in Livermore (Livermore Transit Center, Portola Avenue near Alviso Place, and East Airway Boulevard near Rutan Drive), one is in Dublin (Koll Center Drive and Tassajara Road), and one is in Pleasanton (Johnson Drive and Stoneridge Drive) (Department 2010).

1.2.3 Independent Utility and Logical Termini

FHWA regulations (23 Code of Federal Regulations [CFR] 771.111[f]) require that the action evaluated:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made); and

[1] LOS is discussed further in Section 2.1.2. LOS C indicates traffic flow at or near free-flow speeds. LOS D indicates higher traffic density with slight declines in speed.
[2] The Tri-Valley area consists of Amador Valley, Livermore Valley, and San Ramon Valley, which include Pleasanton, Livermore, Dublin, Sunol, San Ramon, and Danville.

- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The western and eastern project termini fall within the limits of the I-580 Eastbound HOV Lane Project and are intended to use available pavement width constructed by Phases I, II, and III of that project. The proposed project would allow toll pricing to maintain a high level of service in the express lane facility, particularly during the congested afternoon peak period. In doing so, the project would provide an additional mobility option to address heavy traffic through Dublin, Pleasanton, and Livermore, without requiring the additional costs and environmental impacts that would be associated with acquiring property to widen I-580.

No subsequent transportation improvements would be needed within the project limits to optimize operations. The proposed project would not restrict consideration of alternatives for other reasonably foreseeable transportation improvements, including other roadway and interchange improvements on I-580 in the project vicinity and the proposed future extension of BART to Livermore (Section 2.4.2).

1.3 Project Description

This section describes the proposed action and the project alternatives that were developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts. Two alternatives are analyzed in this document: the Build Alternative and the No Build Alternative.

The proposed project would convert the existing I-580 eastbound HOV lane to an express lane facility. The conversion would allow SOVs to pay a toll to use the lanes. HOVs would continue to use the lanes for free. The existing general purpose lanes and planned auxiliary lanes would remain open and unchanged by the project, other than possible minor realignment of the striping.

The purpose of the proposed project is to provide additional congestion relief; provide enhanced operational and safety improvements; expand the available capacity for HOVs; expand the mobility options in this congested corridor; and maintain consistency with provisions defined in Assembly Bill 2032 (2004) and Assembly Bill 574 (2007) to implement express lanes in an HOV system in Alameda County.

1.3.1 Build Alternative

The Build Alternative would convert the existing HOV lane on eastbound I-580 from just west of the Hacienda Drive interchange to just west of the Greenville Road undercrossing to an express lane. A second express lane would be provided from the Fallon Road/El Charro Road interchange to the North First Street interchange, for approximately 6 miles of the 12.1-mile project corridor. Advance notification signs for the express lanes would be placed in the project limits starting west of the Hopyard Road/Dougherty Road overcrossing.

The hours of operation for the express lanes would be the same as for the HOV lane: 5 AM to 9 AM and 3 PM to 7 PM, Monday through Friday. Any changes to the hours of operations will be determined in cooperation with the California Highway Patrol (CHP), Department, FHWA, and MTC.

Net revenue generated from the use of the proposed express lane facility would be used in the I-580 corridor for highway improvements and transit.

1.3.1.1 Express Lane Configuration

Like the existing HOV lane, the express lanes would be adjacent to the center median. A single express lane would begin in the vicinity of the Hacienda Drive interchange (PM 18.95) and end just west of Greenville Road (PM 8.74). A second express lane would begin west of the El Charro Road/Fallon Road overcrossing (PM 16.70) and end east of the North First Street overcrossing (PM 10.13), as shown in Figure 1.3-1.

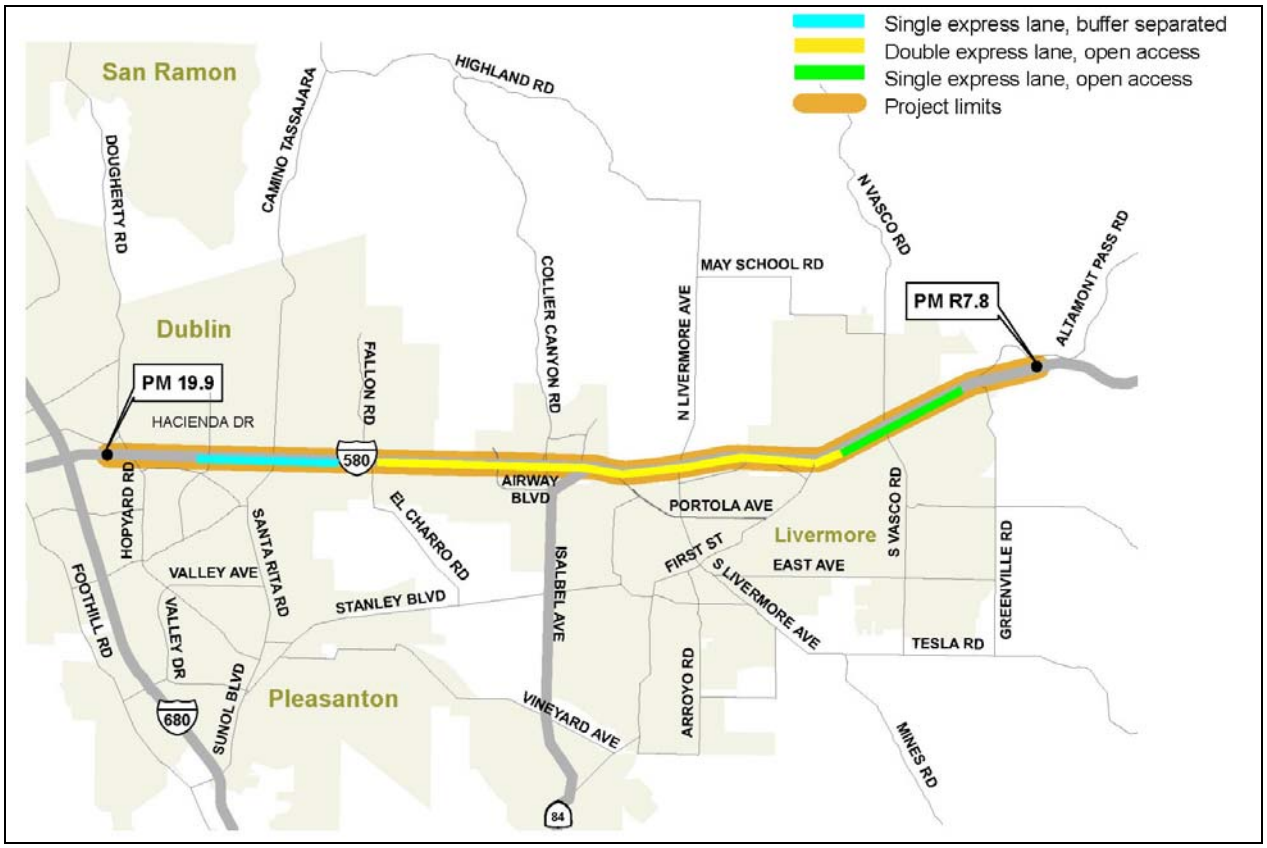

Figure 1.3-1. Express Lane Configuration

Figure 1.3-2 shows a dynamic message sign (DMS), a toll structure, and conceptual lane striping in the section of the project with two express lanes, between El Charro Road/Fallon Road and North First Street. The DMS shows the toll for upcoming destinations. The toll structure has electronic equipment that communicates with FasTrak toll tags to record trips and collect tolls. The toll tag is a small battery-powered radio toll collection device that can be mounted to the inside of a vehicle windshield. This figure does not represent the actual spacing of signs and toll structures. Representative views of the signs and toll structures are provided in Section 2.1.3.3.

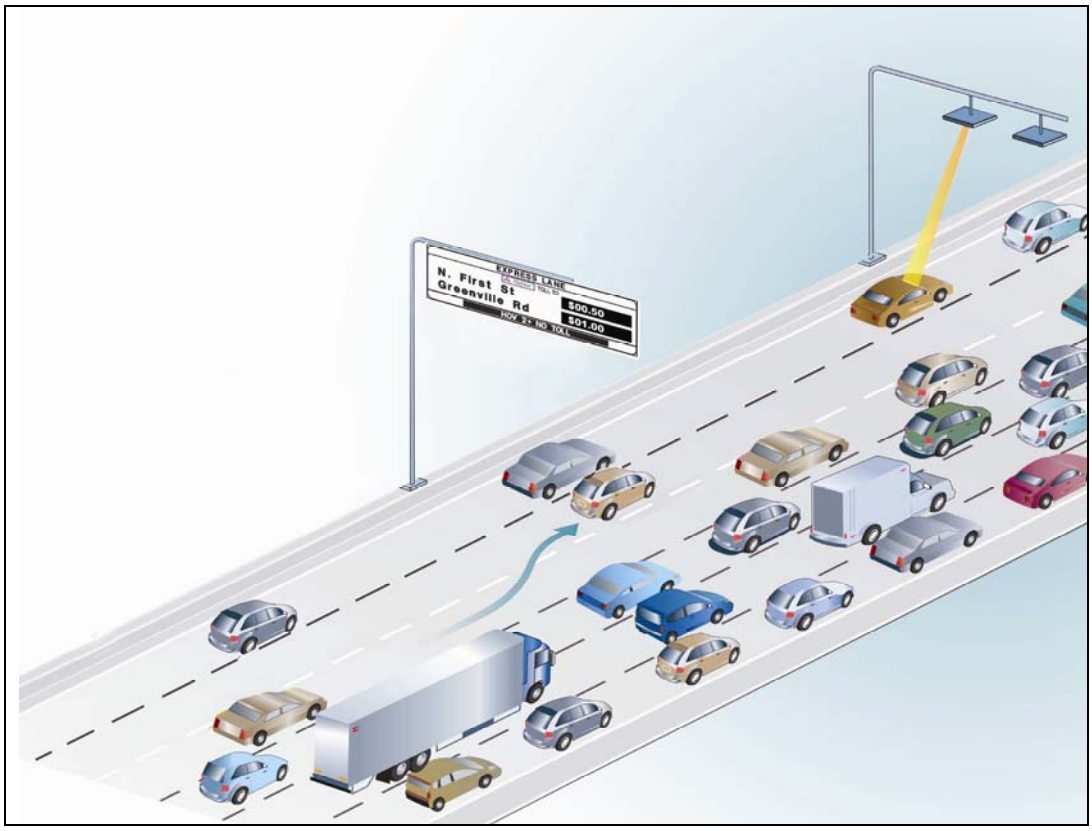

Figure 1.3-2. Express Lane Detail

In all but one location, the express lanes would have an "open access" configuration, meaning that they would be separated from the general purpose lanes by an 8-inch white dashed line to allow traffic to enter and exit anywhere along the corridor. In the segment from Hacienda Drive to El Charro Road/Fallon Road, the express lane would be separated from the general purpose lanes with a 2-foot to 4-foot buffer zone delineated by double solid white striped lines. A buffer separation is proposed in this area to limit vehicle weaving at the beginning of the express lane facility.

1.3.1.2 Express Lane Operations

The project would use a combination of signs, electronic toll collection equipment, and a traffic monitoring system to operate the express lanes.

Overhead signs would be installed to notify drivers as they approach the beginning of the express lanes. DMS placed in approximately eight locations throughout the corridor would display the current toll rates to upcoming interchanges and to the end of express lanes west of Greenville Road. The toll rates would be updated every few minutes to reflect changing speed and traffic density along the express lanes.

After entering the express lanes, vehicle would pass through one or more tolling zones. Tolling equipment would be mounted on overhead cantilever structures placed along I-580 approximately every mile within the project corridor. The tolling equipment would communicate with FasTrak toll tags mounted to the windshields of vehicles that pass through

the tolling zone. The tolling equipment would track the number of zones so that the correct toll is charged to the driver's FasTrak account.

Traffic in all lanes would be monitored, and toll rates would be adjusted based on the congestion in the express lanes and general purpose lanes. Equipment for traffic congestion monitoring would include vehicle detection stations, roadway sensors that can detect vehicles and transmit data to a roadside controller cabinet, and overhead radar vehicle sensors to measure traffic operations in each general purpose lane. New roadway surveillance closed-circuit television (CCTV) cameras for off-site observation of traffic would also be installed at 1-mile intervals in the project limits.

If the monitoring system finds that congestion is low and the express lanes can accommodate more vehicles, the toll rate would be low. If the express lanes have less capacity, the toll rate would be increased as needed, up to a maximum toll rate to be determined, to deter SOVs from entering. The toll increase for SOVs would be used to maintain the minimum average operating speed of 45 mph for HOVs (set by 23 USC 166[d][2]) and the target LOS of C or D for HOVs (California Streets and Highways Code Section 149.5[b]) (Section 1.2.2.3). If the express lanes reach capacity, the message on the DMS would change to read "HOV only." At that point, only HOVs would be allowed into the lanes. SOVs would not be allowed even if they have a FasTrak toll tag.

During off-peak hours, the DMS would display a $0 toll or a message such as "OPEN TO ALL," and the express lanes would function as general purpose lanes. If needed, the DMS would display other messages if the express lanes are closed for maintenance or incident response.

1.3.1.3 Customer Service and Account Management

SOVs will need to have FasTrak toll tags to use the express lanes. FasTrak toll tags are already used to automatically pay tolls on Bay Area bridges. Toll tags can be obtained online; by phone, mail, or fax; in person from the Bay Area Toll Authority (BATA) Regional Customer Service Center (RCSC); or from retail outlets such as Walgreens, Safeway, and Costco. Toll tags can also be obtained anonymously (without providing personal or vehicle information) from the RCSC. There is no charge to open a FasTrak account, but each account holder must keep a minimum balance in a prepaid account.

More information about obtaining a FasTrak toll tag is available at https://www.bayareafastrak.org/vector/dynamic/signup/index.shtml, or call 1-877-BAY-TOLL (1-877-229-8655).

1.3.1.4 Toll Processing

To use the express lanes as an SOV, the user would need to mount a FasTrak transponder to the vehicle windshield. Upon entering the express lanes and then after passing underneath the tolling equipment, transaction records would be sent from each toll zone controller to the Central Processing System (CPS) for processing and configuring trips in a specified format for communicating with the RCSC.

All existing eligible HOVs would continue to be exempt from paying a toll in the I-580 express lanes. Eligible HOVs consist of:

- Passenger cars with two or more occupants (also known as carpool vehicles);
- Transit or para-transit vehicles with no axle count limitation;
- Motorcycles; and
- Alternative fuel vehicles with a Department of Motor Vehicles (DMV)-issued white or green decal.

HOVs do not require a FasTrak toll tag to use the express lanes. Drivers who have a FasTrak toll tag in their vehicle but are carpooling with two or more people can still use the express lanes for free. FasTrak toll tags come with a Mylar bag. Placing the toll tag in the Mylar bag shields the tag from being "read" by the overhead tolling equipment and the toll from being collected.

1.3.1.5 Enforcement

The California Highway Patrol (CHP) is responsible for enforcing all laws that apply to the express lanes, including toll and HOV laws.

Vehicles with a valid FasTrak toll tag would trigger a transaction indicator beacon. CHP officers would monitor the indicator beacon and observe from a distance whether the identified vehicle is an HOV or SOV. If the CHP determines that an SOV in the express lane does not have a valid toll tag, the vehicle will be pulled over and cited.

1.3.1.6 Right-of-Way Requirements

The project does not require any roadway expansion, placement of additional pavement, bridge modifications, or acquisition of right-of-way. The project would use the pavement installed by the I-580 Eastbound HOV Lane Project phases (see Section 1.1).

1.3.1.7 Project Construction

The existing HOV lane would be converted to an express lane facility by eliminating existing striping, delineating travel lanes, and restriping the roadway. Signs, toll structures, lighting, and utility equipment would be installed, as described further below. Project activities east of the Greenville Road undercrossing would be limited to placement of temporary signage during construction.

The project would take approximately 1.5 years to construct.

Signage

The project would construct approximately 15 express lane signs: approximately eight DMS that would display the current toll rate and destination information, and approximately seven fixed-message signs.

Most of the DMS would be mounted on cantilever structures in the median. Three are anticipated to be mounted on the existing bridge structures at Hopyard Road and Hacienda Drive, and approximately one would be set on wooden posts on the shoulder.

Cantilever structures for the signs would be approximately 27 feet in height. Signs mounted on wooden posts would be approximately 17 to 26 feet in height. Smaller signs would also be mounted on the median barrier. The signs would be the same as or similar to existing HOV lane signage used along eastbound I-580 in the project corridor.

All sign structures would be installed within the existing I-580 median and within the footprint of the I-580 Eastbound HOV Lane Project phases.

Toll Structures

The project would construct approximately 14 cantilever structures mounted with toll collection equipment. Another toll collection device would be mounted on an overhead sign. The toll structures would be approximately 26 feet in height. FasTrak electronic tolling system equipment mounted on the cantilever arms would communicate with FasTrak toll tags in SOVs in the express lane to record and charge for trips.

Lighting

Lighting in the median is proposed on the project-related overhead signs and toll structures as well as on mast-arm luminaires. The maximum height of the luminaires would be 35 to 40 feet. The exact spacing and number of mast-arm luminaires in the project corridor would be determined during project design in coordination with the Department.

Utilities

Service and controller cabinets and their concrete pad foundations would be installed along the shoulders on both sides of I-580. Metal beam guard rails or concrete barriers may be installed to protect a limited number of cabinet locations.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The areas where trenching would take place are entirely within the footprint of disturbance for the I-580 Eastbound HOV Lane Project phases. Additionally, conduit may be laterally drilled across the freeway to the median where needed to provide power and communication feeds to the new overhead signs and toll structures.

1.3.1.8 Traffic Systems Management (TSM) and Traffic Demand Management (TDM) Alternatives

TSM strategies increase the efficiency of existing facilities by accommodating a greater number of vehicle trips without increasing the number of through lanes. TSM encourages transit use and ridesharing, which the proposed project would continue to facilitate. The project would increase the efficiency of the existing I-580 facility by allowing for more vehicles to travel within this corridor while minimizing expansion of the freeway. Although TSM measures alone could not satisfy the purpose and need of the project, the following TSM measures have been incorporated into the build alternative for this project: vehicle detection systems to monitor traffic speed and density, enforcement, incident management, and other subsystems to maintain acceptable LOS in the express lanes, which would benefit transit and other HOVs.

TDM focuses on regional means of reducing the number of vehicle trips and vehicle miles traveled (VMT) as well as increasing vehicle occupancy. The project's additional express lane from the Fallon Road/El Charro Road interchange to the North First Street interchange would increase capacity for HOV users.

1.3.1.9 Estimated Cost

The project is funded through federal American Reinvestment and Recovery Act funds, state Regional Measure 2 funds, Tri-Valley Transportation Council funds, and other local funds. The estimated total project cost is $31.6 million.

1.3.2 No Build Alternative

The No Build Alternative proposes no modifications to the I-580 corridor, other than routine maintenance and rehabilitation and currently planned and programmed projects. Eastbound I-580 would have four general purpose lanes, one HOV lane, and auxiliary lanes as described in Section 1.1.

1.3.3 Identification of a Preferred Alternative

The Project Development Team identified the Build Alternative as the preferred alternative on February 11, 2014, after considering comments received during the public comment period. The following summarizes the reasons for choosing the Build Alternative over the No Build Alternative:

- The Build Alternative would provide greater traffic congestion relief. The conversion of the HOV lane to an express lane and the addition of a second express lane from west of El Charro Road/Fallon Road to east of North First Street would increase average speed and reduce travel time and delay compared with the No Build Alternative. In 2015, average speed in the eastbound project corridor would increase by 17 percent, travel time would decrease by 14 percent, and delay would decrease by 71 percent as compared to the No Build Alternative. (Table 2.1.2-5). In 2035, average speed would increase by 60 percent, travel time would decrease by 31 percent, and delay would decrease by 80 percent as compared with the No Build Alternative (Table 2.1.2-8).

- The Build Alternative would provide enhanced operational and safety improvements. The project would add traffic monitoring equipment, cameras, and CHP observation areas in the project limits. These additional project components would allow for faster response to accidents, disabled vehicles, and other incidents than with No Build Alternative.

- The Build Alternative would expand the available capacity for HOVs. In the 2015 No Build condition, demand in the HOV lane would exceed capacity from El Charro Road/Fallon Road to Livermore Avenue, and the lane would operate at unacceptable levels of service (Table 2.1.2-3). With the Build Alternative, all express lane segments would operate at acceptable levels of service, and travel time in the express lanes would be about 6 minutes less than in the HOV lane with No Build (Table 2.1.2-4). In the 2035 No Build condition, substantial congestion in the HOV lane would continue from El Charro Road/Fallon Road to Livermore Avenue (Table 2.1.2-6). With the Build Alternative, all express lane segments would operate at acceptable levels of service, and travel time in the

express lanes would be almost 10 minutes less than in the HOV lane with No Build (Table 2.1.2-7).

- The Build Alternative would expand the mobility options in the congested I-580 corridor. With the Build Alternative, drivers of SOVs with active FasTrak accounts would have the option to use the express lane if they choose to do so. In addition, net revenue generated from the express lanes would be used to operate the lanes and for other transportation improvements in the I-580 corridor, including transit.
- The Build Alternative would be consistent with the provisions defined in Assembly Bill 2032 (2004) and Assembly Bill 574 (2007) to implement express lanes in an HOV system in Alameda County.

In conclusion, the Build Alternative would satisfy the purpose and need for the project described in Sections 1.2.1 and 1.2.2, and the No Build Alternative would not.

1.3.4 Alternatives Considered but Eliminated from Further Discussion

The following design variations on the Build Alternative were studied and ultimately rejected and withdrawn from further study for the reasons noted.

1.3.4.1 Eastbound I-580 Express Lanes With 4-Foot Buffer

A 4-foot-wide buffer between the general purpose lanes and the express lanes was considered, along with improvements at some locations along the corridor to provide wider travel lanes and shoulders than the Build Alternative. The wider lanes and shoulders would require additional right-of-way acquisition, new retaining walls, cut/fill slopes, construction staging, drainage, and landscaping. Including these features would affect areas adjacent to the existing freeway, lengthen the time of construction, and add cost to the project. These elements were considered and rejected because of the right-of-way acquisition needed outside of the mainline freeway and the additional construction and costs.

1.3.4.2 Other Improvements Considered

A barrier-separated facility would have a physical divider such as a concrete barrier in the buffer zone between the express lanes and the adjacent general purpose lanes. This option would deter lane crossing and toll evasion more effectively than a striped buffer zone. The freeway would have to be widened to accommodate a physical barrier in the buffer zone and maintain standard shoulders, which would require additional right-of-way acquisition and potentially new retaining walls, cut/fill slopes, construction staging, drainage, and landscaping. Construction of this facility would have higher capital costs and maintenance costs than the Build Alternative. This option was rejected because of the higher costs as well as the lack of flexibility to easily modify the express lanes' layout in the future, if needed.

Soft separation devices such as delineators were also considered but rejected because delineators can be easily dislodged, causing safety and operational problems for traffic as well as for the maintenance crews that have to replace the devices.

In addition, concrete barriers, delineators, and other forms of physical separation between the express lanes and general purpose lanes limit the ability of law enforcement officers to pull over express lane violators.

1.3.5 Permits and Approvals Needed

The following approval would be required for project construction:

Agency	Permit/Approval	Status
Federal Highway Administration	Concurrence with project's conformity to Clean Air Act and other requirements.	Air quality studies submitted for FHWA concurrence on February 11, 2014. FHWA conformity determination issued on March 12, 2014 (see Appendix D, Part D3).

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Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter addresses the environmental impacts of the proposed project. The environmental resource discussions presented in this chapter are based on the technical studies cited at the beginning of each discussion and listed in Appendix H. An evaluation of the proposed project consistent with CEQA checklist criteria is provided in Appendix B. Avoidance, minimization, and/or mitigation measures are discussed in the following sections and summarized in Appendix F.

For the proposed project, the CEQA baseline for all resource areas except traffic, air quality, and noise is 2010–2012, the period when environmental studies commenced. For traffic, the CEQA baseline is 2005, the most recent year for which complete 24-hour volumes and truck counts were available when the traffic studies began in 2010, supplemented with travel time runs conducted by Alameda CTC in 2006 and 2007. The air quality and noise studies began in 2011 and used the 2005 baseline year traffic data for existing conditions with the most current monitoring and measurement data for the study area.

As part of the scoping and environmental analysis carried out for the project, the following environmental issues were considered but no adverse impacts were identified. As a result, there is no further discussion about these issues in this document.

Land Use

All project activities would take place within the highway median, lanes and shoulders, and right-of-way. No land acquisition is necessary. The project would not influence or change land-use patterns. The project area is not within a coastal zone nor is it in proximity to any existing or proposed Wild and Scenic Rivers. The project would not acquire any parkland, change or inhibit access to any parkland, or result in a facility that would cause any proximity impacts to parkland or recreational areas. The *Noise Study Report* for the proposed project evaluated three parks near the project corridor for noise levels and potential noise impacts (a park on the northwest corner of Northfront Road and Herman Avenue, a park north of Saddleback Circle, and the Dublin Sports Complex along westbound I-580 east of I-680) and found that the project would not increase noise levels over existing conditions. The project would not result in a "use" of a Section 4(f) property, as described further in Appendix C.

Growth

Transportation projects can foster economic or population growth, or the construction of additional housing, either directly or indirectly. These effects can occur if a project removes obstacles to growth, particularly by creating new or additional access to areas not previously served by a transportation mode or facility; facilitates or accelerates growth beyond planned or projected developments; or induces growth elsewhere in the region.

While highway improvements in general have the ability to enhance accessibility within local communities, the proposed project would be constructed within the existing eastbound I-580 corridor and would not include the construction of new interchanges or modifications to existing interchanges. As a result, the project would not provide new access to areas previously

inaccessible or improve access in ways that would foster local development beyond that which is already planned.

The project would convert the existing HOV lane within the 12.1-mile project limits to accommodate both HOVs and toll-paying SOVs. The project would also introduce a second express lane between the Fallon Road/El Charro Road and North First Street interchanges, a distance of approximately 6 miles. During the express lane hours of operation, the additional capacity from the project would be limited to the 12.1-mile project corridor and restricted to HOVs and toll-paying SOVs. During other periods when the express lanes are open to all traffic, the only project-related change in capacity from the existing condition would be the new second lane between the Fallon Road/El Charro Road and North First Street interchanges (the other lane already exists as the HOV lane). The addition of one lane for approximately 6 miles of eastbound I-580 would not create substantial new capacity that could foster growth beyond that which is already planned.

The regional areas served by I-580 that have experienced the most growth in recent years are east of the project limits and east of the Altamont Pass in the Central Valley, such as Tracy, Modesto, and Stockton. The project would increase travel speeds[3] and subsequently reduce travel time through the project corridor, which would provide an incremental improvement in accessibility between the Central Valley and the Bay Area. The improvement would not be great enough to outweigh the overall travel time and distance between the Central Valley and the Bay Area, such that it would encourage significant numbers of people to move to Central Valley locations and commute to Bay Area jobs. Moreover, the project would not increase the capacity of I-580 in the Altamont Pass or points farther east. For these reasons, the project would not induce growth elsewhere in the region.

Farmlands/Timberlands

The project would not acquire any right-of-way; therefore, it would not convert or conflict with zoning for farmlands or timberlands or involve other changes that could result in conversion of farmlands or timberlands. No impacts would occur.

Community Impacts

The project would not result in impacts to the following:

- Community Character and Cohesion: The project would not displace or relocate any residents, change any existing community boundaries, physically divide an established community, or create a new barrier to movement within the project area. Access to and from I-580 and nearby streets would not change as a result of this project.
- Relocations and Real Property Acquisition: The project would not require acquisition or relocation of any residences, businesses, or other land uses.
- Environmental Justice: The proposed project would not cause disproportionately high and adverse effects on any minority or low-income populations. The project corridor has a generally consistent ethnic and income profile; the population is predominantly white (averaging 60.64 percent; U.S. Census Bureau 2010a), and the 2010 median household

[3] The project would increase average speeds by 17 percent in 2015 and 60 percent in 2035 for peak-period commuters that travel on eastbound I-580 through the project area (Section 2.1.2.2).

income averaged $105,000 (U.S. Census Bureau 2010b). The median household income is above the Department of Health and Human Service poverty guideline ($23,050 for a family of four in 2012; Federal Register, Vol. 77, No. 17, 4034–4035). Therefore, this project is not subject to the provisions of Executive Order 12898.

Hydrology and Floodplain

The proposed project would not add any impervious surface and would require minimal ground disturbance for installation of signs, toll structures, lighting, and utility connections. The project activities would not increase water surface elevation as currently defined on any Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), and would not result in any hydromodification impacts.

Water Quality and Storm Water Runoff

The project would not add impervious surface or result in any changes that would increase sediment or pollutant loads in storm water runoff, as described in the *Storm Water Data Report*. No impacts to water quality and storm water runoff would occur.

Geology/Soils/Seismic/Topography

The only structures that would be added by the project are signs, toll structures, lighting, and utility cabinets. Geotechnical considerations within the project area would be addressed with standard department design and construction techniques. No impacts to geology/soils/seismic/topography would occur.

2.1 Human Environment

2.1.1 Utilities/Emergency Services

2.1.1.1 Affected Environment

Utilities in the project vicinity were identified through site visits and reviews of utility plans obtained from the Department, the local jurisdictions, Pacific Gas & Electric (PG&E), and various communications providers. Utilities in the project area include:

- Overhead electric and communications;
- Underground electric, gas, sanitary sewer, water, reclaimed water, communications, and fiber optic; and
- Water, electric, and communications on existing structures.

PG&E is the primary provider of gas and electricity service in the project area. SBC, Sprint, and Comcast offer communications services (telephone, Internet, and cable). Water service is provided by the Dublin San Ramon Services District, City of Pleasanton Water Division, City of Livermore Municipal Water Department, and California Water Service Livermore District. Storm water and sanitary sewer systems are maintained locally.

Police protection and traffic enforcement in the project area are provided by the City of Dublin Police Department, City of Pleasanton Police Department, City of Livermore Police Department, Alameda County Sheriff's Department, and CHP.

Fire protection service for the City of Dublin is provided by the Alameda County Fire Department. The Cities of Livermore and Pleasanton have consolidated their fire protection services.

2.1.1.2 Environmental Consequences

No utility impacts are anticipated. Any needed utility connections for tolling equipment or sign lighting would be identified during the project design phase, and any required coordination with affected utility companies would take place.

The project would require full or partial lane and shoulder closures to allow for utility work such as installation of conduit or sensors in or under the roadway. These actions could result in short-term, temporary impacts to travelers on eastbound I-580 during project construction, including emergency service providers. The project includes preparation of a Transportation Management Plan (TMP) to minimize traffic disruptions from project construction. The TMP will provide for public outreach to inform local agencies and the public of the times and locations of upcoming construction, construction signage in and approaching the project area, and incident management for traffic control in the vicinity of construction activities. Access will be maintained for emergency response vehicles. No adverse impacts to emergency services are anticipated from project construction.

2.1.1.3 Avoidance, Minimization, and/or Mitigation Measures

None required.

2.1.2 Traffic and Transportation/Pedestrian and Bicycle Facilities

The information in this section is summarized from the *Traffic Operations Report* for the proposed project. This project would affect I-580 eastbound only. Traffic conditions are therefore described for the eastbound direction of the freeway only, focusing on the peak hour of congestion (5 PM to 6 PM), which represents the worst-case traffic scenario. Because the project is limited to the operation of the eastbound freeway lanes, pedestrian and bicycle facilities would not be affected and therefore are not discussed further.

2.1.2.1 Affected Environment

I-580 is an interregional corridor serving the Bay Area and the Central Valley. As a major urban corridor for the Tri-Valley area, which includes the cities of Pleasanton, Dublin, Livermore, as well as unincorporated Alameda County, I-580 serves a large number of commuters who work in the Bay Area and live in eastern Alameda and Contra Costa counties and the Central Valley. The corridor is also used for the movement of goods and freight between San Francisco Bay Area ports and Central California.

A traffic study to evaluate the effects of converting the HOV lane to a buffer-separated express lane facility was conducted in 2009–2010. The HOV lane opened between Portola Avenue and Greenville Road in October 2009 and between Hacienda Drive and Portola Avenue in November 2010 (Section 1.1). To account for the HOV lane that was under construction, the traffic study used projected demand data for future HOV lane use. Existing conditions were based on 24-hour volumes and truck counts collected by the Department in 2005 and travel time runs conducted by Alameda CTC in 2006 and 2007.

In 2013, the traffic study was updated to evaluate the "open access" configuration, in which traffic can enter and exit the express lanes anywhere along the corridor except for the segment from Hacienda Drive to El Charro Road/Fallon Road. The updated study projected HOV lane demands based on 2011 counts. Future year traffic demands for the No Build and Build alternatives were projected using the most current Alameda County Travel Demand Model (developed and maintained by Alameda CTC) and observed 2011 volumes. The most updated inputs from the Association of Bay Area Governments (ABAG) Projections 2009 were used for the Alameda County Travel Demand Model.

The baseline traffic conditions included in the No Build Alternative assumed one HOV lane from Hacienda Drive to Greenville Road; four general purpose lanes; and auxiliary lanes between Isabel Avenue and Livermore Avenue, and between Livermore Avenue and North First Street. The Build Alternative assumed one express lane from Hacienda Drive to Greenville Road and a second express lane from El Charro Road/Fallon Road to North First Street, and the same general purpose lanes and auxiliary lanes included in the No Build Alternative.

Transportation planners and engineers commonly use a grading system referred to as Level of Service (LOS) to measure and describe the operational status of the local roadway network. LOS is a description of the quality of a roadway facility's operation, ranging from LOS A (indication of free-flow traffic conditions with little or no delay) to LOS F (representing oversaturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). Vehicle density, calculated by vehicles per lane per mile, is used to determine the overall LOS that a roadway facility provides. A qualitative description of LOS conditions and the corresponding vehicle densities are shown in Table 2.1.2-1. The Department and Alameda CTC consider LOS E and F to be unacceptable levels of service.

Table 2.1.2-1: Level of Service Thresholds

Level of Service	Description	Density (vplpm)
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	≤11
B	Free-flow speeds are maintained. The ability to maneuver within the traffic stream is only slightly restricted.	> 11 to 18
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver with the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 to 26
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 to 35
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 to 45
F	Represents a breakdown in flow.	> 45

Note: Density is reported in vehicles per lane per mile (vplpm)
Source: Highway Capacity Manual (Transportation Research Board 2000).

The density and LOS of each study segment for existing conditions at the time the traffic study commenced (baseline year 2005) are shown in Table 2.1.2-2. During the PM peak, all study segments operate at LOS E or F.

Table 2.1.2-2: Peak Hour Travel Conditions, Existing Conditions

I-580 Eastbound Segment	Density[1]	LOS
San Ramon Road – I-680	46.74	F
I-680 – Hopyard Road/Dougherty Road	42.17	E
Hopyard Road/Dougherty Road – Hacienda Drive	52.27	F
Hacienda Drive – Santa Rita Road/Tassajara Road	51.74	F
Santa Rita Road/Tassajara Road – El Charro Road/Fallon Road	55.35	F
El Charro Road/Fallon Road – Airway Boulevard	59.29	F
Airway Boulevard – Portola Avenue[2]	54.47	F
Portola Avenue[2] – Livermore Avenue	50.40	F
Livermore Avenue – First Street	46.72	F
First Street – Vasco Road	58.04	F
Vasco Road – Greenville Road	39.23	E
East of Greenville Road	40.38	E

Notes:
1. Density is expressed in vehicles per lane per mile.
2. At the time the traffic study was conducted, the Portola Avenue interchange was still in operation. The interchange has since been removed and replaced with an overcrossing without connection to I-580. A new interchange at Isabel Avenue was completed between Airway Boulevard and Portola Avenue in 2011 and is included in the evaluation of 2015 and 2035 conditions.

Existing conditions normally serve as the CEQA baseline.[4] For this project, the existing conditions at the time the environmental studies began did not include the HOV lane that is now in operation, which contributes to the poor levels of service shown in Table 2.1.2-2. Therefore, a comparison of existing conditions to the No Build and Build alternatives does not reflect the same number of eastbound lanes or the change in traffic capacity from the HOV lane. The No Build conditions shown for the project opening year of 2015 include the HOV lane and are compared to Build Alternative conditions in Section 2.1.2.2.

2.1.2.2 Environmental Consequences

Opening Year Conditions

PM peak hour (5 PM to 6 PM) vehicle densities and levels of service for the No Build and Build Alternatives during the project opening year of 2015 are shown in Table 2.1.2-3. Travel times for the No Build and Build Alternatives for 2015 are shown in Table 2.1.2-4.

In the 2015 No Build condition, the general purpose lanes would all operate at acceptable levels of service (LOS D or better; Table 2.1.2-3). Demand in the HOV lane would exceed capacity from El Charro Road/Fallon Road to Livermore Avenue, and the lane would operate at unacceptable LOS E and F (Table 2.1.2-3). These levels of service would fail to meet the statutory requirement of LOS C or D for HOV lanes. In addition, travel times in the HOV lane would be higher than in the adjacent general purpose lanes for five of eight HOV lane segments

[4] Under CEQA, the baseline for an environmental impact analysis can consist of the existing conditions at the time the environmental studies began or at the time a Notice of Preparation for the environmental document is issued. The baseline is the condition against which project changes are compared.

(Table 2.1.2-4). Some corrective action, independent of the proposed project, would be needed to address the condition.

In the 2015 Build condition, the general purpose lanes would also have acceptable levels of service. Operations would improve slightly from Airway Boulevard to Livermore Avenue (from LOS D with No Build to LOS C with Build) and from North First Street to Vasco Road (LOS C with No Build; LOS B with Build; Table 2.1.2-3). Travel time in the general purpose lanes would decrease by almost a minute compared with No Build (17.67 minutes with No Build and 16.88 minutes with Build; Table 2.1.2-4).

The conversion of the HOV lane to an express lane and the addition of a second express lane from west of El Charro Road/Fallon Road to east of North First Street would improve levels of service in five of eight express lane segments compared with the No Build condition (Table 2.1.2-3). All express lane segments would operate at acceptable levels of service, and the three segments with unacceptable LOS E and F under No Build (El Charro Road/Fallon Road to Airway Boulevard, Airway Boulevard to Isabel Avenue, and Isabel Avenue to Livermore Avenue) would operate at LOS B with the project (Table 2.1.2-3). Travel time in the express lanes (Build Alternative, 16.53 minutes) would be about 6 minutes less than in the HOV lane (No Build Alternative, 22.68 minutes; Table 2.1.2-4).

Table 2.1.2-3: PM Peak Hour Travel Conditions, 2015

	No Build				**Build**			
	HOV		**General Purpose**		**Express**		**General Purpose**	
I-580 Eastbound Segment	**Density[1]**	**LOS**	**Density[1]**	**LOS**	**Density[1]**	**LOS[2]**	**Density[1]**	**LOS**
West of San Ramon Road	–	–	25.1	C	–	–	25.1	C
San Ramon Road – I-680	–	–	25.8	C	–	–	25.9	C
I-680 – Hopyard Road/Dougherty Road	–	–	22.3	C	–	–	22.1	C
Hopyard Road/Dougherty Road – Hacienda Drive	–	–	18.9	C	–	–	19.4	C
Hacienda Drive – Santa Rita Road/Tassajara Road	8.8	A	19.4	C	19.7	C	19.0	C
Santa Rita Road/Tassajara Road – El Charro Road/Fallon Road	18.5	C	20.7	C	9.1	**A**	19.3	C
El Charro Road/Fallon Road – Airway Boulevard	35.6	E	22.2	C	14.3	**B**	19.7	C
Airway Boulevard – Isabel Avenue	69.6	F	28.8	D	13.7	**B**	19.3	**C**
Isabel Avenue – Livermore Avenue	107.0	F	32.8	D	14.0	**B**	19.8	**C**
Livermore Avenue – First Street	21.0	C	18.2	C	9.3	**A**	19.3	C
First Street – Vasco Road	16.6	B	19.3	C	13.6	B	17.4	**B**
Vasco Road – Greenville Road	14.9	B	20.1	C	12.8	B	20.8	C
East of Greenville Road	–	–	18.0	B	–	–	17.7	B

Notes:
1. Density is expressed in vehicles per lane per mile.
2. Toll rates for single-occupant vehicles will be adjusted based on the level of congestion. Vehicle detection systems will automatically adjust tolls to maintain free-flowing conditions (LOS C/D) in the express lanes.
The dash (–) indicates that the segment would not have an HOV or express lane.
Boldfaced LOS letters indicate improvement in Level of Service compared with the No Build Alternative.

Table 2.1.2-4: PM Peak Hour Travel Times (in Minutes), 2015

I-580 Eastbound Segment	No Build		Build	
	HOV	General Purpose	Express	General Purpose
West of San Ramon Road	–	1.70	–	1.70
San Ramon Road – I-680	–	0.81	–	0.81
I-680 – Hopyard Road/Dougherty Road	–	1.42	–	1.42
Hopyard Road/Dougherty Road – Hacienda Drive	–	1.14	–	1.16
Hacienda Drive – Santa Rita Road/Tassajara Road	0.58	0.62	0.62	0.63
Santa Rita Road/Tassajara Road – El Charro Road/Fallon Road	1.65	1.69	1.60	1.67
El Charro Road/Fallon Road – Airway Boulevard	1.88	1.63	1.50	1.56
Airway Boulevard – Isabel Avenue	1.42	0.90	0.74	0.77
Isabel Avenue – Livermore Avenue	6.78	2.53	1.81	1.88
Livermore Avenue – First Street	2.05	1.98	1.93	2.00
First Street – Vasco Road	1.08	1.06	1.05	1.06
Vasco Road – Greenville Road	1.30	1.32	1.32	1.35
East of Greenville Road	–	0.87	–	0.87
Total	*22.68*[1]	*17.67*	*16.53*[1]	*16.88*

Notes:

1. For segments without HOV/express lanes, general purpose lane travel times are included in the total travel time for the project corridor.
The dash (–) indicates that the segment would not have an HOV or express lane.

The conversion of the HOV lane to an express lane and the addition of a second express lane from west of El Charro Road/Fallon Road to east of North First Street would provide additional capacity and slightly increase the vehicle miles traveled within the project corridor (Table 2.1.2-5). The project would increase average speed and reduce travel time and delay, thus improving the operational efficiency of the overall corridor (Table 2.1.2-5).

Table 2.1.2-5: 2015 PM Peak Hour Measures of Effectiveness

Measure of Effectiveness	Units	Year 2015 Conditions		Difference in Measure of Effectiveness for Build Alternative	
		No Build	Build	Amount	Percent
Vehicle Miles Traveled	Vehicle Miles	143,750.30	145,636.61	1,886.31	1
Total Travel Time	Vehicle Hours	2,727.85	2,350.59	377.26	-14
Average Speed	Miles Per Hour	53.01	61.96	8.95	17
Total Delay Time	Vehicle Hours	569.17	163.01	406.16	-71

The Build Alternative is not expected to result in impacts to local arterials, roads, or intersections.

Horizon Year Conditions

PM peak hour (5 PM to 6 PM) vehicle densities and levels of service for the No Build and Build Alternatives for 2035 are shown in Table 2.1.2-6, and travel times are shown in Table 2.1.2-7.

With the No Build Alternative, the general purpose lanes from west of San Ramon Road to I-680 and from El Charro Road/Fallon Road to Isabel Avenue are projected to operate at unacceptable

levels of service (LOS E or F) during the PM peak hour, when demand is projected to exceed capacity (Table 2.1.2-6). Heavy on- and off-ramp demand within relatively short distances between interchanges is projected to cause delays in the general purpose lanes. As with the 2015 scenario, the HOV lane would operate at unacceptable LOS F from El Charro Road/Fallon Road to Livermore Avenue (Table 2.1.2-6). This level of service would fail to meet the statutory requirement of LOS C or D for HOV lanes, and some corrective action would be needed. Travel times in the HOV lane would also be higher than in the adjacent general purpose lanes for six of eight HOV lane segments (Table 2.1.2-7).

The Build Alternative would improve levels of service in six of the 12 general purpose lane segments (Table 2.1.2-6). Only one segment, San Ramon Road to I-680, would operate at unacceptable LOS E. Travel time in the general purpose lanes would decrease by 4 minutes compared with No Build (21.44 minutes with No Build and 17.43 minutes with Build; Table 2.1.2-7). All express lane segments would operate at acceptable levels of service, and the three segments with unacceptable LOS F under No Build would operate at acceptable LOS B or C with the project (Table 2.1.2-6). Travel time in the express lanes would be almost 10 minutes less than in the HOV lane (26.94 minutes for No Build and 17.00 minutes for Build; Table 2.1.2-7).

Table 2.1.2-6: PM Peak Hour Travel Conditions, 2035

	No Build				**Build**			
	HOV		**General Purpose**		**Express**		**General Purpose**	
I-580 Eastbound Segment	**Density[1]**	**LOS**	**Density[1]**	**LOS**	**Density[1]**	**LOS[2]**	**Density[1]**	**LOS**
West of San Ramon Road	–	–	59.7	F	–	–	30.5	**D**
San Ramon Road – I-680	–	–	55.1	F	–	–	37.5	**E**
I-680 – Hopyard Road/Dougherty Road	–	–	23.1	C	–	–	27.7	D
Hopyard Road/Dougherty Road – Hacienda Drive	–	–	19.5	C	–	–	23.1	C
Hacienda Drive – Santa Rita Road/Tassajara Road	9.9	A	22.1	C	23.6	C	25.7	C
Santa Rita Road/Tassajara Road – El Charro Road/Fallon Road	32.2	D	34.8	D	11.1	**B**	23.6	**C**
El Charro Road/Fallon Road – Airway Boulevard	94.5	F	44.6	E	16.8	**B**	23.1	**C**
Airway Boulevard – Isabel Avenue	121.7	F	47.6	F	18.9	**C**	22.8	**C**
Isabel Avenue – Livermore Avenue	88.1	F	33.3	D	20.4	**C**	23.8	**C**
Livermore Avenue – First Street	23.1	C	18.3	C	13.2	**B**	22.9	C
First Street – Vasco Road	18.3	C	21.7	C	17.8	**B**	24.0	C
Vasco Road – Greenville Road	12.7	B	21.0	C	11.2	B	23.5	C
East of Greenville Road	–	–	18.6	C	–	–	20.1	C

Notes:

1. Density is expressed in vehicles per lane per mile.

2. Toll rates for single-occupant vehicles will be adjusted based on the level of congestion. Vehicle detection systems will automatically adjust tolls to maintain free-flowing conditions (LOS C/D) in the express lanes.

The dash (–) indicates that the segment would not have an HOV or express lane.
Boldfaced LOS letters indicate improvement in Level of Service compared with the No Build Alternative.

Table 2.1.2-7: PM Peak Hour Travel Times (in Minutes), 2035

I-580 Eastbound Segment	No Build		Build	
	HOV	General Purpose	Express	General Purpose
West of San Ramon Road	–	3.55	–	1.75
San Ramon Road – I-680	–	1.42	–	0.96
I-680 – Hopyard Road/Dougherty Road	–	1.47	–	1.52
Hopyard Road/Dougherty Road – Hacienda Drive	–	1.14	–	1.20
Hacienda Drive – Santa Rita Road/Tassajara Road	0.60	0.64	0.64	0.70
Santa Rita Road/Tassajara Road – El Charro Road/Fallon Road	1.99	2.02	1.61	1.70
El Charro Road/Fallon Road – Airway Boulevard	3.77	2.27	1.52	1.59
Airway Boulevard – Isabel Avenue	3.26	1.35	0.76	0.78
Isabel Avenue – Livermore Avenue	4.50	2.43	1.86	1.95
Livermore Avenue – First Street	2.06	1.99	1.96	2.02
First Street – Vasco Road	1.08	1.07	1.07	1.13
Vasco Road – Greenville Road	1.24	1.23	1.29	1.27
East of Greenville Road	–	0.86	–	0.86
Total	*26.94*[1]	*21.44*	*17.00*[1]	*17.43*

Notes:

1. For segments without HOV/express lanes, general purpose lane travel times are included in the total travel time for the project corridor.
The dash (–) indicates that the segment would not have an HOV or express lane.

The express lanes would increase the vehicle miles traveled within the project corridor by approximately 11 percent in the 2035 PM peak hour compared with the No Build condition (Table 2.1.2-8). The project would also improve operations by increasing average speeds by 60 percent and reducing total delay by 80 percent (Table 2.1.2-8).

Table 2.1.2-8: 2035 PM Peak Hour Measures of Effectiveness

Measure of Effectiveness	Units	Year 2035 Conditions		Difference in Measure of Effectiveness for Build Alternative	
		No Build	Build	Amount	Percent
Vehicle Miles Traveled	Vehicle Miles	154,250.46	173,683.91	19,433.45	11
Total Travel Time	Vehicle Hours	4,359.66	3,023.96	1,335.70	-31
Average Speed	Miles Per Hour	35.93	57.44	21.51	60
Total Delay Time	Vehicle Hours	2,043.96	414.58	1,629.38	-80

Construction Impacts

The project would require full or partial closures of the eastbound lanes and shoulders and the westbound left (inside) shoulder to allow for restriping, utility trenching, and installation of overhead signage. The closures could result in short-term, temporary impacts during project construction.

All of the improvements that will be constructed by the project will comply with the applicable provisions of the ADA.

2.1.2.3 Avoidance, Minimization, and/or Mitigation Measures

The project includes preparation of a TMP to minimize traffic disruptions from project construction. The TMP will provide for public outreach to inform the public of the times and locations of upcoming construction, construction signage in and approaching the project area, and incident management for traffic control in the vicinity of construction activities. With the TMP, no adverse construction impacts are anticipated.

Because the project is not expected to result in adverse traffic impacts, no further avoidance, minimization, and/or mitigation measures are proposed.

2.1.3 Visual/Aesthetics

This section describes the visual setting of the project area as described in the *Visual Impact Assessment* completed for the proposed project in August 2013.

2.1.3.1 Regulatory Setting

The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically (emphasis added) and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109[h]) directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

2.1.3.2 Affected Environment

Scenic Vistas and Scenic Resources

While the Department's California Scenic Highway Mapping System identifies I-580 in the project corridor as eligible for designation as a state scenic highway, it is not designated as such (Department 2007b). As a result of vegetation loss and development along the corridor, I-580 within the project limits likely would not meet the criteria for designation as a state scenic highway (Walker 2011).

Alameda County designated I-580 as a scenic route in 1966 (City of Dublin 2010). The Eastern Dublin Scenic Corridor Policy includes I-580 and applies to development visible from the freeway (City of Dublin 2010). The City of Livermore General Plan identifies I-580 as a scenic corridor and limits certain types of development and commercial signage within 3,500 feet of the freeway centerline that is visible from the roadway (City of Livermore 2009).

The Department has also classified portions of the project corridor as Landscaped Freeway, a designation that is used to control the placement of outdoor advertising displays in landscaped areas adjacent to freeways (California Business and Professions Code Section 5440; Department 2011c). The five portions classified as Landscaped Freeway total approximately 3 miles of the 12.1-mile project limits.

The existing median of eastbound I-580 in the project limits is either paved with a concrete median barrier or contains BART tracks and the Dublin/Pleasanton BART station. No landscaping is present in the median. Shoulder vegetation consists of ornamental landscaping, ruderal/disturbed species (with a high proportion of exotic species such as sweet fennel [*Foeniculum vulgare*], black mustard [*Brassica nigra*], and a variety of thistles), and nonnative annual grassland.

Sound walls are present along eastbound I-580 between the eastbound on-ramp at Santa Rita Road/Tassajara Road and the El Charro Road/Fallon Road exit, and between the eastbound on-ramp to I-580 at Vasco Road and the North Greenville Road/Altamont Pass Road exit. Concrete barriers are also present in several locations along the shoulder.

No scenic resources as defined by CEQA or Chapter 27 of the Department's Standard Environmental Reference exist along the project corridor. The City of Livermore General Plan's Community Character Element, Objective CC-1.3, Policy P1 identifies "views of the nighttime sky unimpaired by inappropriate intensities of light and glare … as a significant scenic resource" (City of Livermore 2009).

Visual Quality

The majority of the existing median of eastbound I-580 in the project limits is either paved with a concrete median barrier or contains BART tracks and the Dublin/Pleasanton BART station. Unpaved median areas are present in the vicinity of the Greenville Road interchanges and in a short segment east of the Dublin/Pleasanton BART station. Unpaved median areas contain a mosaic of ruderal roadside and landscaped vegetation that is subject to routine Department highway maintenance. These areas are dominated by nonnative species such as bristly ox-tongue (*Picris echioidies*), black mustard, and sweet fennel.

Shoulder vegetation consists of ornamental landscaping, ruderal/disturbed species (with a high proportion of exotic species such as sweet fennel, black mustard, and a variety of thistles), and nonnative annual grassland. Concrete barriers are also present in several locations along the shoulder.

Sound walls are present along eastbound I-580 between the eastbound on-ramp at Santa Rita Road/Tassajara Road and the El Charro Road/Fallon Road exit, and between the eastbound on-ramp to I-580 at Vasco Road and the North Greenville Road/Altamont Pass Road exit. A new sound wall will be built along eastbound I-580 between East Airway Boulevard and Portola Road by Phase III of the I-580 Eastbound HOV Lane Project in late 2013. In the westbound direction, sound walls are present between Vasco Road and First Street, and an existing sound wall along Northfront Road/Sunflower Court will be extended eastward by the I-580 Westbound HOV Lane Project (EA 29082_) in late 2013.

The project corridor contains existing overhead and shoulder signage. Approximately 45 large-panel signs (approximately 4 by 8 feet or larger) are present along eastbound I-580 in the median, on the shoulder, and on bridge structures. Approximately three changeable message signs are also present along the shoulder.

Mast-arm lighting standards are present along the shoulder and at interchanges in several locations of the project corridor. Approximately 58 lighting standards (Type 21 or similar) are

along the eastbound I-580 mainline or along off-ramps and on-ramps within two lane widths of the mainline. Approximately 70 other lighting standards (Type 21 or similar) are on freeway overcrossings, ramp areas that are more than two lane widths from the mainline, or roads that directly parallel eastbound I-580 such as Kitty Hawk Road. Other local street or parking lot lights are present along eastbound I-580 on Rosewood Drive, Pimlico Drive, East Airway Boulevard, and Las Positas Road; at businesses between the Hacienda Drive and Santa Rita Road/Tassajara Road interchanges, between the Airway Boulevard interchange and Portola Avenue, at the Vintage Square shopping center and other commercial and industrial parcels east of North Livermore Avenue, at the Plaza 580 shopping center west of the North First Street interchange, and at businesses along Southfront Road. The Dublin-Pleasanton BART station in the median has platform lighting, and the Dublin Sports Grounds complex along westbound I-580 between the I-680 and Hopyard Road/Dougherty Road interchange has several large light structures for evening sporting events.

Areas of dense development (including commercial and residential multistory buildings, some with small setbacks), parking lots of auto dealerships and other businesses, off-site advertising structures, power lines and other utility lines are visible throughout the majority of the corridor. The least developed portions of the project corridor are from west of the El Charro Road/Fallon Road interchange to the Airway Boulevard interchange, and from the Portola Avenue exit to the North First Street interchange, where views of open space or agricultural land border the freeway. Large portions of the corridor have distant views to the east, northeast, and southeast of rolling hills and ridgelines with few built structures, Mount Diablo, and Brushy Peak.

The corridor as a whole has moderate visual quality.

2.1.3.3 Environmental Consequences

Project Changes to the Visual Environment

The project would change the appearance of I-580 through lane striping and installation of roadside equipment, signs, toll structures, and lighting. No new sound walls or changes to existing sound walls are proposed as part of the project. Project activities and the level of change to the visual environment are described further below.

Lane Striping and Roadside Equipment

The proposed project would convert the single HOV lane to an express lane facility. In all but one location, the express lanes would have an "open access" configuration, meaning that they would be separated from the mixed flow lanes by an 8-inch white dashed line to allow traffic to enter and exit anywhere along the corridor. In the segment from Hacienda Drive to El Charro Road/Fallon Road, the express lane would be separated from the mixed flow lanes with a 2-foot to 4-foot buffer zone delineated by double solid white striped lines.

Service and controller cabinets and their concrete pad foundations would be installed along the shoulders on both sides of I-580. The service cabinets would be approximately 4 feet tall, 1.5 feet wide and 1.5 feet deep. The controller cabinets would be approximately 3.8 to 4.7 feet tall, 1.6 feet wide, and 2 to 2.5 feet deep. Metal beam guard rails or concrete barriers may be installed to protect a limited number of cabinet locations.

When completed, the lane striping, cabinets, and metal beam guard rails or concrete barriers would be visually compatible with the existing freeway corridor. These items would represent a low level of change to the existing visual environment.

Signs

The project would construct approximately 15 express lane signs, which would consist of the following:

- Approximately eight dynamic message signs (DMS) would be installed to display the current toll rate and destination information so SOVs can decide whether to enter the express lanes. The DMS would indicate that HOVs are allowed to use the express lanes facility free of charge (see Exhibit A, below); and
- Approximately seven dedicated express lane entrance or exit signs (see Exhibit B, below).

Exhibit A.
Representative view of a DMS with mast-arm luminaire (from I-680 southbound express lanes)

Exhibit B.
Representative view of a dedicated express lane entrance sign (from I-680 southbound express lanes)

Most of the signs would be mounted on cantilever structures in the median. Three are anticipated to be mounted on the existing bridge structures at Hopyard Road/Dougherty Road and Hacienda Drive, and approximately one would be set on wooden posts on the shoulder.

Cantilever structures for the signs would be approximately 27 feet in height. Signs mounted on wooden posts would be approximately 17 to 26 feet in height.

Smaller signs would also be mounted on the median barrier (see Exhibit C, below). The signs would be the same as or similar to existing HOV lane signage.

Exhibit C. Representative examples of median-mounted signs

Eastbound I-580 in the project corridor contains overhead signs including cantilever-mounted signs and cantilever-arm structures with multiple signs, as well as other infrastructure such as utility poles, towers, and overhead lines. Project signage would introduce a low to moderate level of change to the existing environment.

Toll Structures

The project would construct approximately 14 cantilever structures mounted with toll collection equipment (see Exhibit C, below). Another toll collection device would be mounted on an overhead sign. The toll structures would also be approximately 26 feet in height. As described in Section 1.3.1.2, FasTrak electronic tolling system equipment mounted on the cantilever arms would communicate with the FasTrak transponders in SOVs in the express lanes to record and charge for trips. The toll structures would have a slender profile and represent a low level of change to the existing environment.

Exhibit C. Representative view of a toll structure (from I-680 southbound express lanes)

All toll structures would be installed within the existing I-580 median.

Lighting

Lighting in the median is proposed on the project-related overhead signs and toll structures as well as on mast-arm lighting standards. Type 10 luminaires would be installed on approximately 15 overhead signs and 14 toll structures. A Type 10 luminaire on an overhead sign is shown in Exhibit A. Type 21D mast-arm luminaires would be mounted on the concrete median barrier. In both cases, the maximum height of the luminaires would be 35 to 40 feet. In some locations, the luminaires would be double mast-arm to provide illumination to both directions of I-580.

Both types of luminaires would have light-emitting diodes (LEDs) configured at the minimum necessary number of bulbs, optimal mounting height, mast arm length, and angle to restrict light to the paved freeway. If needed, the luminaires would be outfitted with shields to prevent light trespass to adjacent properties and special-status species habitat along the freeway.

The spacing and number of Type 21D mast-arm luminaires in the project corridor would be determined during detailed project design in coordination with Caltrans Traffic Safety.

The proposed luminaires would have a slender profile and would be visually compatible with those in the existing freeway corridor. I-580 in the project limits already contains lighting along and just outside of the freeway, and adjacent commercial and other land uses have nighttime illumination. Project lighting would introduce a moderate level of change to the existing environment.

Project Impacts

This section evaluates how the project-related changes described above would affect viewers in the project vicinity: motorists on I-580, viewers adjacent to I-580 (including at residences), and viewers in more distant areas.

Scenic Vistas, Scenic Resources, and Visual Quality

The project would not have a substantial adverse effect on a state scenic highway or scenic resources as defined by CEQA. Effects on views of hills, ridgelines, and mountains are described below by project component. Views of the nighttime sky, identified in the Livermore General Plan as a significant scenic resource, and the effects of project illumination are addressed under "Light and Glare," below.

Lane Restriping and Roadside Equipment

Motorists on I-580. Lane restriping and roadside equipment would be primarily noticeable to motorists during the construction period only. The cabinets and any associated guard rail or barrier protection would be small in scale in the context of the existing viewshed and would not block views of surrounding areas.

Viewers adjacent to I-580 and in more distant areas. Lane restriping and addition of roadside equipment is not expected to affect viewers outside of the freeway corridor.

Impact summary. As these project components would represent a low level of change to the existing visual setting and would be minimally visible to viewers, no effects to scenic vistas, scenic resources, or visual quality in or around the project corridor would occur.

Signs, Toll Structures, and Lighting

Overhead signs, toll structures, and luminaires are considered together in this discussion because they represent similar structures in the freeway corridor in terms of height, and in the case of overhead signs, visual mass. The effects of project illumination are addressed under "Light and Glare," below.

Median barrier-mounted signs would be small in scale and consistent with the corridor's existing visual character. These types of signs are expected to have little, if any, effect on visual quality for all viewer groups.

Motorists on I-580. During the day, the cantilever-mounted overhead signs, toll structures, and luminaires would be visible in the foreground of motorists' distant views of hills and undeveloped areas adjacent to the freeway. Approximately 58 large-panel overhead and shoulder signs and 70 mast-arm luminaires are already present along eastbound I-580 within the project corridor. Views of the project signage, toll structures, and luminaires would be consistent with existing freeway apparatus in the corridor and short in duration for motorists moving at freeway speeds.

Viewers adjacent to I-580. During day and nighttime hours, the signs, toll structures and luminaires would be visible to viewers at various land uses adjacent to both sides of I-580 in locations where the freeway corridor is not shielded by sound walls, trees, tall embankments, or development. Views of the additional signage, toll structures, and luminaires would be generally compatible with this highly trafficked corridor and its segments of urbanization. In areas where I-580 is bordered by undeveloped land, such as between El Charro Road/Fallon Road and Isabel Avenue, the scale of the signs would be relatively small in the context of the existing viewshed and would not block long-range views of the hills and ridgelines to the west, northwest, and southwest. The toll structures and median-mounted luminaires would have slender profiles that would not obstruct views.

Viewers in more distant areas. The I-580 corridor is also visible to viewers in more distant areas such as the Altamont Pass and the East Bay hills to the west of Dublin and Pleasanton. Project signage would be visible in some long-range views, depending on viewer location, and would be consistent with the corridor's existing visual character. The toll structures and luminaires would be minimally visible from a distance.

Impact summary. These project components represent a low to moderate level of change to the existing visual setting and would be visible to motorists and to some viewers outside of the project corridor. Views of the project signage, toll structures, and luminaires would be consistent with the existing freeway setting. No substantial adverse effects on scenic vistas, scenic resources, or visual quality in or around the project corridor would occur.

Light and Glare

The DMS components of the overhead signage will have sensors that automatically adjust the brightness of the toll cost numbers to ambient light conditions, so that the LED components are no brighter than needed for motorist visibility (ETC 2011). Lighting for non-DMS signage would be activated by photocell sensors and would have a fixed level of brightness (Y&C Transportation Consultants 2011). Signs listing upcoming exits and distances, as well as other roadway signs that do not direct motorist actions, are not required to be illuminated unless the signs are illegible without fixed lighting.

As noted previously, the proposed luminaires would have LEDs configured at the minimum necessary illumination level and optimal angle to restrict light to the paved freeway. If needed, the luminaires would be outfitted with shields to prevent light trespass to surrounding properties. The proposed luminaires would be the same or similar to those used on Dumbarton Bridge and approved for use on other roadways. LED luminaires minimize light trespass, direct uplighting (i.e., sky glow), and reflected light from the roadway compared with high-pressure sodium luminaires (Leotek 2013). The distance of the light spread by an LED luminaire similar to the type proposed for this project ranges from 50 to 80 feet in front of the fixture and from 20 to 50 feet behind the fixture, depending on configuration and shielding (ALR 2013). The distance from the eastbound I-580 median to the edge of pavement would be an average of 100 feet, after completion of Phase 3 of the I-580 Eastbound HOV Lane Project. The extent of the light spread by LED luminaires would therefore remain well within the paved freeway corridor. In addition, the distance and pattern of the light distribution would be controlled by the number of LED bulbs, mounting height, mast arm length, shielding, and angle of the fixture as part of project design.

Motorists on I-580. The DMS and project lighting would not adversely affect motorists on I-580. Additional lighting would increase visibility of roadway and traffic conditions, which would benefit motorists by improving safety conditions.

Viewers adjacent to I-580. The DMS and project lighting would be visible to viewers at the various land uses adjacent to both sides of I-580 in locations where the freeway corridor is not shielded by sound walls, trees, tall embankments, or development. Viewers at commercial, industrial, and community land uses (such as schools, hospitals, and civic buildings) are not expected to be sensitive to changes in nighttime lighting on I-580 because activities at these land uses occur primarily during daytime hours. At night, impacts to viewers will be minimal as the proposed lighting will be confined to the paved surface of I-580, with minimal glare or trespass affecting surrounding properties.

Viewers at residential lands uses could be sensitive to changes in nighttime lighting on I-580. Residential development adjacent to I-580 is limited to the following four segments of the project corridor:

- Between the Santa Rita Road/Tassajara Road and El Charro Road/Fallon Road interchanges, approximately 0.60 mile of a residential area borders the south side of I-580. A perimeter road (Pimlico Drive) separates the western half of the development from I-580, and the development receives visual shielding from sound walls and mature trees.
- Between Isabel Avenue and Portola Avenue, approximately 0.25 mile of a residential area borders the south side of I-580. East Airway Boulevard serves as a perimeter road between residences and I-580, and mature trees provide visual shielding.
- Between the First Street and Vasco Road interchanges, approximately 0.60 mile of a residential area borders the north side of I-580. Sound walls and mature trees provide visual shielding.
- Just east of the Vasco Road exit, less than 0.10 mile of a residential area borders the north side of I-580. It is separated from the freeway by Northfront Road, and a small park lies between Northfront Road and the nearest houses. Intermittent trees block views of some freeway features.

In each of these areas, light from project signage or luminaires would either be shielded by sound walls or trees, or at a sufficient distance that daytime or nighttime glare or light intrusion is not anticipated outside of the freeway corridor. Additionally, the light from luminaires would be confined to the paved surface of I-580, with minimal glare or trespass to surrounding residential properties.

Viewers in more distant areas. Open space land uses in the form of parks, resource management land, or large parcel agriculture exist in some areas adjacent to both sides of I-580, particularly in Livermore east and west of North Livermore Avenue, and east of Greenville Road. In addition, the hills that lie north and south of I-580 provide more distant views the freeway corridor. Viewers at these types of locations could be sensitive to changes in nighttime lighting in and along the freeway corridor. As the lighting would be designed to avoid trespass beyond the freeway, adverse impacts to viewers in open space land uses and in the hills north and south of I-580 are not anticipated. Moreover, viewers at these land uses are unlikely to be exposed to nighttime lighting, as the activities at these uses occur primarily during daytime hours.

Impact summary. The DMS signage and the roadway of I-580 would be illuminated as needed for motorist visibility and safety and would not result in inappropriate intensities of light and glare. The signs, toll structures, and luminaires would have nonreflective surfaces. LED luminaires minimize direct uplighting and reflected light from the roadway compared with high-pressure sodium luminaires, and would not contribute appreciably to urban sky glow. Therefore, the project would be consistent with the City of Livermore policy to preserve views of the nighttime sky (Community Character Element, Objective CC-1.3, Policy P1).

Project lighting would represent a moderate level of change to the existing visual setting and would be visible to motorists and to some viewers outside of the project corridor. Lighting associated with the overhead signage and luminaires is not expected to result in light trespass, surface brightness, or glare to motorists on I-580 or to residents or other viewers along the freeway. Substantial adverse changes to the visual environment from light trespass, glare, or surface brightness would not occur.

2.1.3.4 Avoidance, Minimization, and/or Mitigation Measures

If construction operations or staging causes the death or removal of existing vegetation, replacement may be required in accordance with Caltrans policy. As the project is not expected to result in visual impacts, no further avoidance, minimization, and/or mitigation measures are proposed.

2.1.4 Cultural Resources

This section summarizes the *Historic Property Survey Report* for the proposed project, which was completed in August 2013.

2.1.4.1 Regulatory Setting

The term "cultural resources" as used in this document refers to all "built environment" resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic), regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act (NHPA) of 1966, as amended sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation [36 CFR 800]. On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, the Federal Highway Administration (FHWA), State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

The Archaeological Resources Protection Act (ARPA) applies when a project may involve archaeological resources located on federal or tribal land. The ARPA requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties.

Historical resources are considered under the California Environmental Quality Act (CEQA), as well as CA Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet the National Register of Historic Places listing criteria. It further specifically requires the Department to inventory state-owned structures in its rights-of-way.

2.1.4.2 Affected Environment

The study areas for cultural resources investigations are referred to as Areas of Potential Effects (APEs). The archaeological APE consists of a narrow corridor along both sides of I-580 within the project limits and includes locations for construction staging and access. The architectural APE, which typically includes any adjacent parcels with buildings or structures that could be affected by a project, is the same as the archaeological APE because the proposed project would not affect buildings or structures, and no new sound walls are proposed. Both the archaeological and architectural APEs are entirely within the Department's right-of-way.

The vertical APE extends to a maximum of 25 feet below ground surface for the overhead signs; 12 feet below ground surface for the toll structures; 8 feet below ground surface for the roadside sign and new lighting standards; 3.5 feet below ground surface for metal beam guard rails/concrete barriers; and 3 feet below ground surface for installation of conduits and service/controller cabinets.

Records and Archival Review

The cultural resource setting of the proposed project corridor has been studied as part of previous projects on I-580. The proposed project is almost entirely within the archaeological and architectural APEs that were evaluated for the I-580 Eastbound HOV Lane Project phases (described in Section 1.1; Rosenthal and Byrd 2006; Byrd 2011). The APE for the proposed project differs from the I-580 Eastbound HOV Lane Project APE in two locations: it extends approximately 0.8 mile to the west, to accommodate express lane signage in the median; and it encompasses the Isabel Avenue interchange. These areas were covered by the background research, literature review, and record search for the I-580 Eastbound HOV Lane Project (Rosenthal and Byrd 2006; Byrd 2008). The 0.8-mile western extension was surveyed in 1989 for the I-580/I-680 Interchange Improvements Project (S-10762; Rosenthal and Byrd 2006; Byrd 2008). The Isabel Avenue interchange was surveyed in 2001 for the Isabel Avenue/I-580 Interchange Project (S-33432; Byrd 2008).

No previously recorded archaeological resources were identified in the APE during the studies for the I-580 Eastbound HOV Lane Project. One previously observed but unrecorded cultural resource that might extend into the APE (Holman and Associates 1985 in Rosenthal and Byrd 2006) was revisited, and no cultural materials were noted.

The studies for the I-580 Eastbound HOV Lane Project included background research on the archaeology and geomorphology of the study area to evaluate the potential for buried cultural deposits at depths below highway and related facilities. A buried sites sensitivity model was developed, which indicated that only a small portion (approximately 10 percent) of the current APE has potential for buried archaeological resources, particularly in the western half of the Livermore-Amador valley where Late Holocene alluvial fan, floodplain, or basin deposits dominate.

In August 2006, the SHPO concurred with the Department's finding that no historic resources in the APE for the 2007 Negative Declaration/Finding of No Significant Impact (ND/FONSI) for the I-580 Eastbound HOV Lane Project appear to meet the criteria for eligibility for inclusion in the National Register of Historic Places. In April 2011, the Department confirmed that additional

roadway widening for Phase III of the I-580 Eastbound HOV Lane Project would have no impact on historical resources (Byrd 2011).

A new archival records search was conducted for the proposed project at the California Historic Resources Inventory System, Northwest Information Center at California State University, Sonoma. The records search identified only one previously undocumented resource that was not addressed in the studies for the I-580 Eastbound HOV Lane Project. The resource is the Contra Costa-Las Positas 230 kV transmission line, which crosses above I-580 east of Springtown Boulevard. The transmission line dates to 1972 and is not eligible for listing in the National Register of Historic Places.

Native American Consultation

The Native American Heritage Commission (NAHC) was contacted to request a search of the Sacred Lands File for sacred lands or other cultural properties of significance to Native Americans within or near the APE. No sacred lands were identified in the project APE. The NAHC provided a list of Native Americans who may have concerns about the project or knowledge of cultural resources in the APE. E-mails requesting comments and concerns about the project were sent to each individual on the list in July and August 2013, and follow-up phone calls were made in July 2013.

A representative of the Northern Valley Yokut/Ohlone/Miwuk asked that project construction be monitored by both a qualified archaeological firm and Native Americans as the area has a high potential for discoveries. A representative of the Indian Canyon Mutsun Band of Costanoan asked for more information regarding project impacts and sites within 0.25 mile of the APE. This information was provided in August 2013. No further inquiries were received.

2.1.4.3 Environmental Consequences

No cultural resources were identified in the APE in the previous studies of the proposed project corridor. The majority of project construction would take place in areas that have been previously disturbed by the original freeway construction and the I-580 Eastbound HOV Lane Project. Ground disturbance in native soils would occur for the installation of signs, toll structures, and lighting. The areas of proposed disturbance would be approximately 5 to 6 feet in diameter and 25 feet below ground surface for the overhead signs; approximately 3 to 4 feet in diameter and 12 feet below ground surface for the toll structures; approximately 2 feet in diameter and 8 feet below ground surface for the roadside sign; and approximately 2.5 feet in diameter and 8 feet below ground surface for new lighting standards. Given the absence of identified cultural resources within the APE and the small sizes of the areas of subsurface disturbance in native soils, the potential for encountering cultural resources during project construction is extremely low.

No historic built environment resources are present in or adjacent to the APE; therefore, project-related lighting would have no impact on historic resources. Caltrans' determination for the project, in the terminology of Section 106 of the NHPA, is "No Historic Properties Affected."

2.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

2.2 Physical Environment

2.2.1 Paleontology

This section summarizes the *Paleontological Identification Report (PIR)/Paleontological Evaluation Report (PER)* prepared for the proposed project, which was completed in August 2013.

2.2.1.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life in as it is persevered in the geologic record as fossils. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects. 23 United States Code (USC) 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state. Under California law, paleontological resources are protected by CEQA.

2.2.1.2 Affected Environment

The proposed project corridor crosses six different geologic units: three Holocene (basin deposits, floodplain deposits, and alluvial fan deposits); two Pleistocene (alluvial fan and fluvial deposits, and alluvial terrace deposits, first level); and one Pleistocene/Pliocene (Livermore Gravels). The Holocene units are primarily between the western project limit at the Hopyard Road/Dougherty Road overcrossing and the Airway Boulevard overcrossing. The Pleistocene and Pleistocene/Pliocene units primarily extend east of Airway Boulevard to the project limit east of Greenville Road.

The geologic units vary in paleontological sensitivity, as defined by Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines (SVP 1995). The three Holocene units are considered low in sensitivity because of their recent geologic age. The other three units (Pleistocene and Pliocene/Pleistocene) have been documented to yield invertebrate and vertebrate fossil finds in the Bay Area, including in the project vicinity. These units are considered to have high potential to contain sensitive paleontological resources. The literature reviewed indicate that Cenozoic-age vertebrate fossils were identified in Pleistocene deposits in 11 locations in Alameda County, where bison, camel, duck, horse, mammoth, mastodon, mole,

rodent, sloth, turtle, and wolf fossil remains were found. Four locations were specifically noted to be in the Livermore Gravels and to contain bird, horse, mammoth, squirrel, and turtle fossil remains.

An archival search conducted by the University of California Museum of Paleontology indicated that no fossils have been recorded within the project corridor; however, fossils have been collected from Pleistocene and Pleistocene/Pliocene units adjacent to the project corridor as well as within 1 mile.

Although surficial geology along the western portion of the project corridor is identified as Holocene age (where sensitivity is considered low), the depth of the Holocene sediments is unknown (CGS 2008a, b). These more recent sediments have some potential to be underlain by older Pleistocene and Pliocene/Pleistocene age sediments at depths of 25 feet or less.

2.2.1.3 Environmental Consequences

Previous studies of I-580 concluded that excavations within the modern soil depth of approximately 4 feet are not expected to affect paleontological resources. Accordingly, trenching for conduits and installation of service and/or controller cabinets, their concrete pad foundations, and any associated metal beam guard rails and/or concrete barriers would not affect sensitive paleontological resources since these activities would have a depth of less than 4 feet.

Although no fossils are known to directly underlie the project corridor, both signage and toll structures have the potential to be installed in locations with high paleontological sensitivity. For both pile-supported signs and toll structures, piles would consist of driven or cast-in-drilled-hole (CIDH) piles. The installation of driven piles would not result in the exposure of sensitive paleontological resources. Therefore, driven piles would not affect paleontological resources.

Drilling to advance CIDH piles could have the potential to encounter paleontological resources. Drilling would be conducted using truck-mounted rotary drills. This type of drill may rotate out fossil bones or other materials, but the specimens may lack context, depth/elevation, formation identification and other elements that are needed to establish scientific significance. Although unprovenienced fossils may be scientifically useful, they are typically only significant if they result in identification of new species that are currently not known in the county.

Drilling in areas that are mapped as high-sensitivity units at the surface would have the greatest potential to encounter previously undisturbed paleontological resources. As noted in Section 2.2.1.2, the depth of Holocene sediments in the project corridor is unknown, and could be underlain by older Pleistocene and Pliocene/Pleistocene age sediments at depths of 25 feet or less. Therefore, drilling in areas of low sensitivity has an unknown potential to encounter high-sensitivity formations at the depths required for CIDH pile installation.

Excavations for the roadside sign and the mast-arm lighting standards would be at shallower depths and narrower diameters than for the overhead signs and toll structures. However, excavations for the roadside sign and lighting standards in the Pleistocene and Pleistocene/Pliocene geologic units could have the potential to encounter previously undisturbed paleontological resources.

Because the presence or absence of paleontological resources cannot be known until construction is under way, it is unknown whether sensitive paleontological resources could be encountered.

No other project components have the potential to affect paleontological resources.

2.2.1.4 Avoidance, Minimization, and/or Mitigation Measures

Scientifically valuable paleontological resources could be affected by activities such as installation of CIDH piles. The affected area would not be large enough for the impact to be considered significant; however, a potential exists for valuable scientific data to be discarded and lost. As a result, response measures will be taken to reduce effects to sensitive paleontological resources, if encountered.

Preparation of a Paleontological Mitigation Plan (PMP) is recommended to address potential discoveries during project construction. The PIR/PER contains detailed recommendations for measures to be included in the PMP. In addition, the paleontological study conducted for the I-580 Westbound HOV Lane Project (EA 29082_), which addressed the majority of the project corridor, contained a Preliminary PMP (PaleoResource Consultants and F & F GeoResource Associates, Inc. 2008).

Implementation of the following resource stewardship measures would reduce potential impacts to sensitive paleontological resources, if present.

- The Department's standard construction contract specifications regarding paleontological resources will apply. They state:

  If paleontological resources are discovered at the job site, do not disturb the material and immediately:

  1. Stop all work within a 60-foot radius of the discovery
  2. Protect the area
  3. Notify the Engineer

  The Department investigates and modifies the dimensions of the protected area if necessary. Do not move paleontological resources or take them from the job site. Do not resume work within the specified radius of the discovery until authorized.

- Include one or more provisions in the construction contract that address paleontological monitoring during activities that have the potential to disturb high-sensitivity geologic units.

- Once the project design is near completion, prepare a Final PMP based on the recommendations presented in the PIR/PER and/or the 2008 Preliminary PMP (PaleoResource Consultants and F & F GeoResource Associates, Inc. 2008). Implement the PMP at the time of construction.

The above measures would reduce potential impacts to paleontological resources by allowing for the recovery of fossil remains and associated specimen data and corresponding geologic and geographic site data that otherwise might be lost.

No permits are anticipated to be needed for monitoring or fossil recovery.

2.2.2 Hazardous Waste/Materials

2.2.2.1 Regulatory Setting

Hazardous materials, including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use. The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires clean-up of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and clean up contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

2.2.2.2 Affected Environment

An Initial Site Assessment Update was prepared for the project area as part of the 2007 ND/FONSI for the I-580 Eastbound HOV Lane Project. The Initial Site Assessment Update identified hazardous waste and materials sites within 1 mile of the project area; however, no sites were identified within the I-580 right-of-way or close enough to the I-580 right-of-way to pose an environmental concern.

Lead oxide and lead chromate commonly were used in paints until 1978, when regulations limited the allowable lead content in paint. Lead is a suspected carcinogen, has potential to cause birth defects, and is a reproductive toxin. Any yellow traffic paint, yellow thermoplastic paint/tape, or markings placed prior to 1990 contain lead chromate as the pigment, which, when removed, might generate airborne heavy metal debris in excess of the threshold established by Title 22 California Code of Regulations.

Various studies have been performed in the Bay Area that have identified aerially deposited lead (ADL) in soils near roadways, attributed to the use of lead in gasoline, a practice that was phased out beginning in the mid 1970s. Typically, ADL exists in the top 6 inches of soil in unpaved shoulder and median areas of many freeway corridors. The lead levels in surface soils along highways can reach concentrations in excess of the hazardous waste threshold, requiring disposal at either a Class I landfill or onsite stabilization.

2.2.2.3 Environmental Consequences

The proposed project would not involve the acquisition of any new right-of-way and therefore would not affect any hazardous materials sites. Roadway striping would be removed as part of the project. Exposure to airborne contaminants from lead-based paint that could be present in the roadway striping could affect safety and health if not properly handled and disposed during striping removal. As the striping throughout the corridor has been replaced in recent years by the I-580 Eastbound HOV Lane Project and other projects, the striping to be removed would not predate 1990, and therefore no release of airborne contaminants from lead-based paint is anticipated.

A Site Investigation Report for the I-580 Eastbound HOV Lane Project (March 2007) screened the site for ADL. The site investigation indicated that soil generated from excavations up to 2.5 feet in depth would be classified as California hazardous waste due to lead content. The project includes installation of CIDH piles to a maximum depth of approximately 25 feet to support cantilever structures for overhead signage. CIDH piles would also be installed at shallower depths for toll structures and lighting. Trenching of up to 3 feet in depth would be conducted along the outside edge of pavement for installation of conduits. Exposure to airborne contaminants from ADL and other heavy metals, if present in soils disturbed by construction, could affect worker safety and health.

Gasoline, diesel fuel, oil, and lubricants for operation of construction equipment are typically used, handled, and stored by contractors on all roadway construction projects. In all construction projects, there is a potential for the accidental release of fuels or lubricants from construction equipment or vehicles. No specific risks related to such a release have been identified for the proposed project. Contractors are required to handle hazardous materials in accordance with

applicable laws, including health and safety requirements. No acutely hazardous materials would be used or stored on-site during project construction.

2.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

Relatively minor volumes of excavated soil that cannot be used as fill material would be dispersed on site as directed in the Standard Specifications and Special Provisions; otherwise, the material can be removed by the contractor. During construction, unknown hazardous materials could be encountered, or materials could be accidentally spilled. Best Management Practices would be required to minimize or avoid these risks.

2.2.3 Air Quality

This section summarizes the *Air Quality Impact Assessment* and *Mobile Source Air Toxics* technical reports completed for the project in October 2013.

2.2.3.1 Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (USEPA) and California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}), and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (PB) and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional—or, planning and programming—level and the project level. The proposed project must conform at both levels to be approved. Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. USEPA regulations at 40 CFR 93 govern the conformity process. Conformity

requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California) sulfur dioxide (SO_2). California has attainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO_2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years for the RTP) and 4 years (for the TIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open to traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Conformity analysis at the project-level includes verification that the project is included in the regional conformity analysis and "hot-spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide (CO) and/or particulate matter (PM_{10} or $PM_{2.5}$). A region is "nonattainment" if one or more of the monitoring stations in the region measures a violation of the relevant standard and the USEPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by USEPA and are then called "maintenance" areas. "Hot-spot" analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a hot spot analysis. In general, projects must not cause the "hot-spot" related standard to be violated, and must not cause any increase in the number and severity of violations in nonattainment areas. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

2.2.3.2 Affected Environment

The project area is in the San Francisco Bay Area Air Basin (SFBAAB), which does not attain the federal standards for ozone and is unclassified for fine particulate matter ($PM_{2.5}$). For the state standards, which are more stringent than the federal, the region does not attain the ozone, $PM_{2.5}$, or inhalable particulate matter (PM_{10}) standards. Table 2.2.3-1 shows the applicable standards and attainment status of criteria pollutants in the project area.

Due to its topographic diversity, the meteorology and climate of the Bay Area is often described in terms of different subregions and their microclimates. The proposed project is located in the Livermore Valley subregion, as defined by the Bay Area Air Quality Management District (BAAQMD).

The Livermore Valley is a sheltered inland valley near the eastern border of the SFBAAB. The western side of the valley is bordered by 1,000- to 1,500-foot hills with two gaps connecting the valley to the central SFBAAB, the Hayward Pass, and Niles Canyon. The eastern side of the valley also is bordered by 1,000- to 1,500-foot hills with one major passage to the San Joaquin Valley called the Altamont Pass and several secondary passages. To the north lie the Black Hills and Mount Diablo. A northwest-to-southeast channel connects the Diablo Valley to the Livermore Valley. The south side of the Livermore Valley is bordered by mountains approximately 3,000 to 3,500 feet high.

During the summer months, when there is a strong inversion with a low ceiling, air movement is weak and pollutants become trapped and concentrated. Maximum summer temperatures in the Livermore Valley range from the high 80s to the low 90s, with extremes in the 100s. Average winter maximum temperatures range from the high 50s to the low 60s, while minimum temperatures are from the mid to high 30s, with extremes in the high teens and low 20s.

Table 2.2.3-1: State and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards[2]	
		Concentration	Attainment Status	Concentration[3]	Attainment Status
Ozone (O_3)	8 Hour	0.070 ppm (137 µg/m^3)	N[9]	0.075 ppm (157 µg/m^3)	N[4]
	1 Hour	0.09 ppm (180 µg/m^3)	N		See Footnote 5
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m^3)	A	9 ppm (10 mg/m^3)	A[6]
	1 Hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	A
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	A	0.100 ppm (see Footnote 11)	U
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	NA	0.053 ppm (100 µg/m^3)	A
Sulfur Dioxide (SO_2) (see Footnote 12)	24 Hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	A
	1 Hour	0.25 ppm (655 µg/m^3)	A	0.075 ppm (196 µg/m^3)	A
	Annual Arithmetic Mean	NA	NA	0.030 ppm (80 µg/m^3)	A
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N[7]	NA	NA
	24 Hour	50 µg/m^3	N	150 µg/m^3	U
Particulate Matter - Fine ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N[7]	12 µg/m^3	A[15]
	24 Hour	NA	NA	35 µg/m^3 (see Footnote 10)	N
Sulfates	24 Hour	25 µg/m^3	A	NA	NA
Lead (see Footnote 13)	Calendar Quarter	NA	NA	1.5 µg/m^3	A
	30 Day Average	1.5 µg/m^3	A	NA	A
	Rolling 3 Month Average	NA	NA	0.15 µg/m^3	See Footnote 14
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	U	NA	NA
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 µg/m^3)	NIA	NA	NA
Visibility Reducing particles	8 Hour (10:00 to 18:00 PST)	See Footnote 8	U	NA	NA

Notes: A=Attainment, N=Nonattainment, NIA= No Information Available, U=Unclassified; mg/m^3=milligrams per cubic meter; ppm=parts per million; µg/m^3=micrograms per cubic meter, NA=Not Applicable, PST=Pacific Standard Time

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.
2. National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th-highest daily concentrations is 0.075 ppm or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m^3. Except for the National particulate standards, annual standards are met if the annual average falls below the standard at every site. The National annual standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.
3. National air quality standards are set by USEPA at levels determined to be protective of public health with an adequate margin of safety.
4. In June 2004, the Bay Area was designated as a marginal nonattainment area of the National 8-hour ozone standard. USEPA lowered the national 8-hour ozone standard from 0.080 to 0.075 ppm (i.e., 75 ppb) effective May 27, 2008.
5. The National 1-hour ozone standard was revoked by USEPA on June 15, 2005.
6. In April 1998, the Bay Area was redesignated to attainment for the National 8-hour carbon monoxide standard.
7. In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.
8. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.
9. The 8-hour State ozone standard was approved by CARB on April 28, 2005, and became effective on May 17, 2006.
10. USEPA lowered the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3 in 2006. USEPA designated the Bay Area as nonattainment of the PM2.5 standard on October 8, 2009. The effective date of the designation is December 14, 2009 and the Air District was given 3 years to develop a plan, called a State Implementation Plan (SIP), that demonstrates the Bay Area will achieve the revised standard by December 14, 2014. On November 7, 2012, the Air District adopted a $PM_{2.5}$ emissions inventory to fulfill federal

Table 2.2.3-1: State and National Ambient Air Quality Standards

air quality planning requirements, and transmitted the inventory to CARB for inclusion in the SIP. On January 9, 2013, the USEPA issued a final rule to determine that the San Francisco Bay Area has attained the 24-hour $PM_{2.5}$ NAAQS.11. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).
12. On June 2, 2010, the USEPA established a new 1-hour SO2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO2 NAAQS however must continue to be used until 1 year following USEPA initial designations of the new 1-hour SO2 NAAQS. USEPA expects to designate areas by June 2012.
13. CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure below which there are no adverse health effects determined.
14. National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.
15. USEPA lowered the annual $PM_{2.5}$ standard from 15 $\mu g/m^3$ to 12 $\mu g/m^3$ in 2012, and plans to designate areas as attainment or nonattainment by December 12, 2014.
Sources: BAAQMD 2013a, b; USEPA 2013.

Air pollution potential is high in the Livermore Valley, especially for photochemical pollutants such as ozone in the summer and fall. High temperatures increase the potential for ozone to build up. The valley not only traps locally generated pollutants but can be the receptor of ozone and ozone precursors from San Francisco, Alameda, Contra Costa and Santa Clara counties. On northeasterly wind flow days, most common in the early fall, ozone may be carried west from the San Joaquin Valley to the Livermore Valley.

During the winter, the sheltering effect of the valley, its distance from moderating water bodies, and the presence of a strong high pressure system contribute to the development of strong, surface-based temperature inversions. Pollutants such as carbon monoxide and particulate matter generated by motor vehicles, fireplaces, and agricultural burning can become concentrated. Air pollution problems could intensify because of population growth and increased commuting to and through the subregion (BAAQMD 2010a).

2.2.3.3 Environmental Consequences

Air quality issues relate to a range of different pollutants for which individual regulatory standards exist. The evaluation of air quality impacts addressed in this section focuses on the project's conformity with the regional air quality framework and the project's potential to result in an adverse impact to the region's compliance with the relevant standards.

Regional Air Quality Conformity

The proposed project is listed in the *Plan Bay Area* financially constrained Regional Transportation Plan (ABAG and MTC 2013, RTP ID 240050), which was found to conform by MTC on July 18, 2013, and FHWA and FTA made a regional conformity determination on August 12, 2013. The project is also included in MTC's financially constrained 2013 Transportation Improvement Program (MTC 2013, page S3-100, TIP ID ALA070020). The MTC's 2013 Transportation Improvement Program was found to conform by FHWA and FTA on August 12, 2013. The design concept and scope of the proposed project is consistent with the project description in the 2013 RTP, the 2013 TIP, and the open to traffic assumptions of the MTC's regional emissions analysis.

The project is in conformity with the SIP and will not otherwise interfere with timely implementation of any Transportation Control Measures (TCM) in the applicable SIP.

Permanent Impacts

Evaluation of Potential for Traffic-Related CO Impacts

Traffic-related CO effects were evaluated to determine whether the project would cause or contribute to any new localized CO violations. The CO impacts analysis followed the procedures in *Transportation Project-Level Carbon Monoxide Protocol* (CO Protocol; Garza, Graney, and Sperling 1997), using screening criteria for projects in attainment or unclassified areas. The analysis consisted of two steps: a screening step to determine whether the project would affect CO levels at nearby intersections based on changes in levels of service, and a more detailed analysis to determine whether project-related increases in traffic volumes would affect local CO levels.

According to the CO Protocol, projects with traffic volumes that exceed 1,000 vehicles per hour should undergo analysis to determine CO impacts. The project area exceeds this traffic volume, so CO modeling was performed as described in the following section.

Evaluation of the CO Analysis

A modeling analysis for CO impacts was completed for locations along the I-580 corridor for both the Build and No Build Alternatives using traffic volumes obtained from the traffic analysis (URS 2013a). The maximum traffic flows within the project area were assumed to occur throughout the project area as a conservative scenario, including the most congested portions of the project area representing the maximum CO contribution. The CALINE4 model was used for the analysis, following the guidelines contained in Appendix B of the CO Protocol.

The No Build and Build Alternatives were modeled at two segments along the mainline of I-580. Receptors were placed at potential receptor locations along the I-580 corridor at the outside edge of traveled way of the westbound and eastbound lanes, in order to represent the worst-case possible exposure to project-related CO emissions. The highest, most conservative PM peak traffic volume at these locations was used in the model. Other locations that would be potentially affected by the proposed project are not expected to experience CO concentrations higher than the highest predicted among these locations. The assumptions used in the hot-spot analysis are consistent with those used in the regional emissions analysis.

A project is considered to have significant impacts if it results in CO concentrations that exceed the 1 hour average State standard of 20 parts per million (ppm), the 1 hour average Federal standard of 35 ppm and/or the 8 hour average standard of 9.0 ppm. As shown in Table 2.2.3-2, the maximum predicted concentrations (including background) at the selected segments are below these standards for the No Build and Build Alternatives for both opening year 2015 and horizon year 2035. These results support the conclusion that the proposed project will not cause or contribute to any new localized CO violations through at least the project study year of 2035.

Table 2.2.3-2: CO Modeling Results

Scenario	Maximum CO 1-hour Concentration (ppm)	Maximum CO 8-hour Concentration (ppm)
No Build 2015	2.70	1.64
Build 2015	2.70	1.64
No Build 2035	2.60	1.57
Build 2035	2.50	1.50

Notes:
1. NAAQS for 1-hour CO is 35 ppm and CAAQS for 1-hour CO is 20 ppm. NAAQS and CAAQS for 8-hour CO is 9 ppm.
2. 1-hour and 8-hour background concentrations were obtained from the Livermore station (793 Rincon Ave., Livermore, CA 94551).
3. 1-hour background concentration was found to be 2.4 ppm (USEPA 2013).
4. 8-hour background concentration was found to be 1.43 ppm (CARB 2013).
5. A persistence factor of 0.7 was used to convert 1-hour CO concentration to 8-hour CO concentration.
ppm = parts per million

Particulate Matter "Hot-Spot" Analysis

A quantitative particulate matter hot-spot analysis is required for transportation projects that are determined to be a Project of Air Quality Concern (POAQC) as defined in Title 40 CFR Part 93, funded or approved by the FHWA or the FTA, and in Federal nonattainment or maintenance areas for particulate matter less than 10 micrometers in diameter (PM_{10}) or particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$). This project is unclassified for the Federal PM_{10} standards, so a PM_{10} hot-spot analysis is not required for project-level conformity purposes.

The USEPA designated the SFBAAB as a Federal nonattainment area for the 35 $\mu g/m^3$ $PM_{2.5}$ standard, effective December 14, 2009. The BAAQMD submitted an implementation plan for the new Federal standard to CARB on November 7, 2012, for inclusion in the SIP. Even though there is no implementation plan for $PM_{2.5}$, a $PM_{2.5}$ hot-spot analysis is required for any project that is determined to be a POAQC as defined in Title 40 CFR Part 93, because the air basin has been classified as nonattainment under the Federal $PM_{2.5}$ standard. After December 22, 2012, projects requiring detailed PM_{10} or $PM_{2.5}$ analysis must follow the December 20, 2010, Quantitative Analysis Guidance. The USEPA issued a final rule in 2013 stating that the SFBAAB has attained the standard and proposing to suspend implementation plan requirements for the Bay Area. Regardless, for the time being, a $PM_{2.5}$ hot spot analysis is required for any project that is determined to be a POAQC as defined in Title 40 CFR Part 93.

In May 2011, Alameda CTC, as the project sponsor, initiated consultation with the Air Quality Conformity Task Force regarding the project's potential to be a POAQC. In July 2011, the project team provided the Task Force with a qualitative $PM_{2.5}$ hot-spot analysis to document potential project effects on $PM_{2.5}$ emissions (included in Appendix D, Part D1). As project construction would not last more than five years at any individual location, the hot spot analysis did not include estimates for construction-related $PM_{2.5}$ emissions. The Air Quality Conformity Task Force reviewed the methods, assumptions, and analysis used in the hot-spot analysis and on July 28, 2011, determined that the project is not anticipated to result in future or worsened violations of $PM_{2.5}$ standards.[5]

[5] After the Task Force consultation was concluded, the project limit was shifted by 0.8 mile to the west (from west of the Hacienda Drive interchange [PM 19.1] to west of the Hopyard Road/Dougherty Road

During the public review and comment period for the Initial Study/Environmental Assessment (IS/EA), public comment was requested regarding the hot-spot analysis (Appendix D, Part D1) and the Task Force's determination. No comments were received on the air quality conformity determination. The FHWA issued a project-level conformity determination on March 12, 2014 (Appendix D, Part D3).

Ozone

The BAAQMD adopted the 2010 Clean Air Plan to plan for and achieve compliance with the Federal and State ozone standards (BAAQMD 2010b). This project will not interfere with the Clean Air Plan and will provide transportation benefits that reduce pollutant emissions, including precursors to the formation of ozone, by improving traffic operations and efficiency. This project is included in the Bay Area region's RTP (ABAG and MTC 2013), which has undergone regional evaluation for conformity with Federal air quality standards, including ozone.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which standards exist, the USEPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources. Mobile source air toxics (MSATs) are a subset of the air toxics defined by the Clean Air Act. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or impurities in oil or gasoline.

This section includes a basic quantitative analysis of the likely MSAT emission impacts of the proposed project. Available technical tools do not enable prediction of the project-specific health impacts of the emission changes associated with the No Build and Build alternatives. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of the proposed project.

I-580 already has traffic volumes exceeding 150,000 Annual Average Daily Traffic (AADT). The project would add express lanes to part of the project corridor. Therefore, a quantitative analysis was performed using the Department's program CT-EMFAC to identify and compare the potential differences among the priority MSAT emissions from the project alternatives.

For the Build and No Build alternatives, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, if other variables such as fleet mix remain the same. The estimated VMT in the local area for the Build Alternative would be higher than the No Build

overcrossing [PM 19.9]) to accommodate advance notification signs for the express lane facility. On November 16, 2011, Alameda CTC received concurrence from the Task Force that the change in project limit does not alter the conformity analysis (MTC 2011b). On December 5, 2013, Alameda CTC notified the Task Force of changes in the project access configuration, and confirmed that the changes do not alter the conformity analysis (see Appendix D, Part D1).

because the express lane would allow for toll-paying SOVs to use the lane in addition to HOVs, and a second express lane would be added for part of the project corridor. The shift of some vehicles into the express lane would allow for a nominal increase in vehicles in the general purpose lanes. The increase in VMT would lead to slightly higher MSAT emissions for certain pollutants for the Build Alternative than for the No Build Alternative.

The CT-EMFAC model shows that the Build Alternative would decrease acetaldehyde emissions by 1 percent and increase all other priority MSAT emissions (acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter) by 1 percent or less over the No Build Alternative in the project opening year (2015). For the Build Alternative in the design year (2035), emissions for diesel particulate matter would increase by 4 percent, and all other priority MSAT emissions would decrease from 8 to 30 percent compared with the No Build Alternative.

Emissions would be lower for both alternatives in the design year (2035) as compared to the opening year (2015) as a result of USEPA's national control programs, which are projected to reduce MSAT emissions by 72 percent by 2020. The magnitude of the USEPA-projected reductions from its national control programs is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

In conclusion, overall MSAT emissions for the Build Alternative would be slightly higher than for the No Build Alternative in the project opening year (2015). In the design year (2035), most MSAT emissions would decrease with the Build Alternative. The decreased emissions are expected to result from increased speeds on the highway with the Build Alternative in 2035. The results from the model runs show that the project would not have an adverse impact on, or a substantial increase in, MSAT emissions.

Naturally Occurring Asbestos and Structural Asbestos

The proposed project is not within a mapped area of naturally occurring asbestos (California Geological Survey 2000). No project activities would disturb structures that potentially contain asbestos.

Construction Impacts

Construction would be limited to restriping and installation of signs, toll structures, lighting, and utility equipment. Construction is scheduled to begin in fall 2014 and be completed by late 2015.

The Department's Special Provisions and Standard Specifications will include the requirement to minimize or eliminate dust through the application of water or dust palliatives. Implementation of additional measures will be considered during development of the project's Plans, Specifications, and Estimates. The BAAQMD considers any project's construction-related impacts to be less than significant if the appropriate measures for dust and combustion control are implemented. Due to the limited nature of construction activities for the proposed project, construction emissions are not quantified and are expected to be less than significant.

Climate Change

Climate change is analyzed at the end of this chapter. Neither the United States Environmental Protection Agency (USEPA) nor Federal Highway Administration (FHWA) has issued explicit

guidance or methods to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will aid decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders on climate change, the issue is addressed in a separate California Environmental Quality Act (CEQA) discussion at the end of this chapter and may be used to inform the National Environmental Policy Act (NEPA) decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

The Department's Special Provisions and Standard Specifications will include the requirement to minimize or eliminate dust during project construction through the application of water or dust palliatives. Implementation of the measures below could further minimize air quality emissions during construction. Control measures will be implemented as specified in Standard Specifications Section 14-9.01 "Air Pollution Control" and Section 14-9.02 "Dust Control." Appropriate measures from among the following will be considered during development of Plans, Specifications, and Estimates (PS&E) for the project construction contract:

- Water all active construction areas daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
- Enclose, cover, water twice daily or apply (nontoxic) soil binders to exposed stockpiles (dirt, sand, etc.)
- Limit traffic speeds on unpaved roads to 15 mph.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

In addition, pollutant emissions in construction equipment exhaust can be mitigated by the following:

- Keeping engines properly tuned;
- Limiting idling; and
- Avoiding unnecessary concurrent use of equipment.

2.2.4 Noise

The following summarizes the *Noise Study Report*, completed in November 2011, and the *Noise Abatement Decision Report*, completed in April 2012.

2.2.4.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The CEQA noise analysis is included at the end of this section.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA (and the Department, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 A-Weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). Table 2.2.4-1 lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2.2.4-1: Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, $L_{eq}(h)$	Description of Activities
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

[1] Includes undeveloped lands permitted for this activity category.

Figure 2.2.4-1 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with common activities.

According to the Department's *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011* (TNAP), a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Department's TNAP sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 7 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance and the cost per benefited residence.

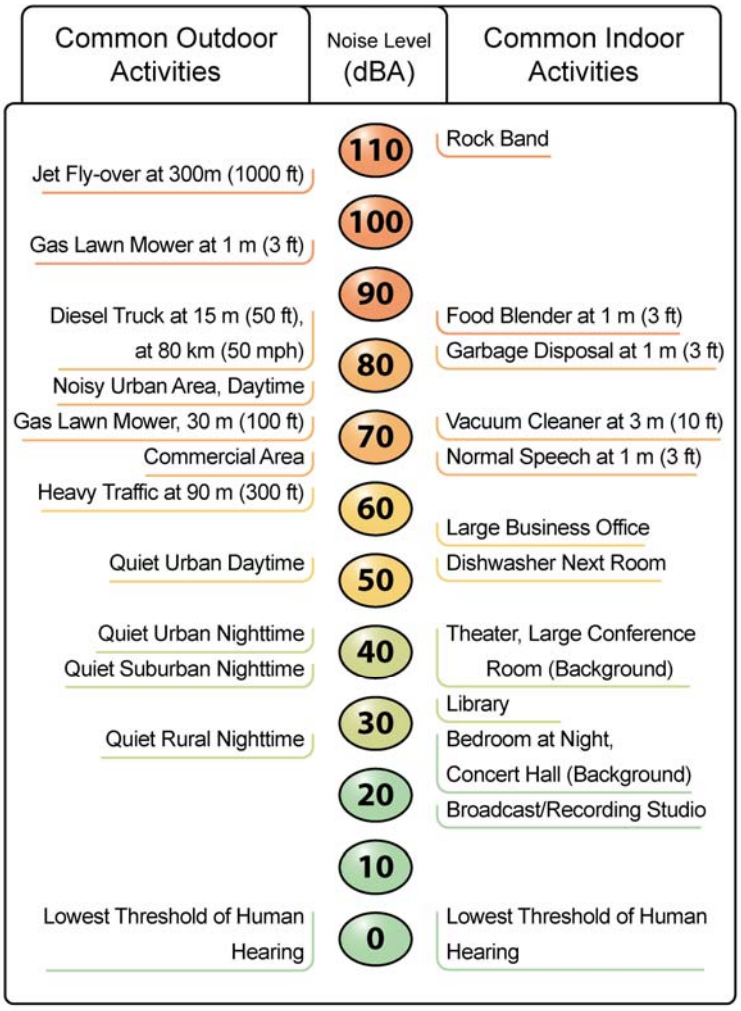

Figure 2.2.4-1. Noise Levels of Common Activities

2.2.4.2 Affected Environment

The existing noise environment throughout the project corridor varies by location, depending on site characteristics such as proximity to I-580 and other noise sources, the relative highway and local elevations and terrain, and any intervening structures or barriers. The project area has a mix of single-family and multi-family residential, commercial, industrial, and agricultural land uses. Category B land uses include single-family and multi-family residences. Recreational areas (Category C) include parks, golf courses, and public areas. Category D activity areas include the interiors of noise-sensitive land uses such as churches and schools. Hotels and motels are Category E land uses.

Existing Sound Walls

The study area has eight existing barriers in the form of sound walls or berms constructed to reduce I-580 traffic noise. Barrier characteristics were compiled through observations made during the noise measurement survey, as well as plan sheets provided. These barriers are summarized in Table 2.2.4-2, which indicates the barrier identification, location, construction material, and height.

Table 2.2.4-2: Existing Barriers

Barrier ID	Location	Sheet No. (Appendix A)	Construction Material	Height (feet)
A	Along Almaden and Berryessa Road	22,23	Masonry	12
B	Along Sunflower Court	21,22	Masonry	12
C	Along Sundance Road	20,21	Masonry	16
D	Along Saddleback Circle	15	Earthen Berm	10-12
E	Along Annis Circle	9	Masonry	12
F	Along Pimlico Drive and Kirkcaldy Street	8,9	Masonry	Varies
SW2	North of Southfront Road	22, 23	Masonry	12
SW3	North of the westbound First Street off-ramp	20, 21	Masonry	16

The following additional noise barriers were not in place at the time the noise study was conducted but were treated as existing barriers:

- Sound Wall (SW) 1: This 12-foot, approximately 1,900-foot-long noise barrier will be built between East Airway Boulevard and Portola Avenue in early to mid 2014 by Phase III of the I-580 Eastbound HOV Lane Project (04-2908U1).
- SW2 and SW3: SW2 is a 12-foot, approximately 950-foot-long noise barrier just north of Southfront Road. SW3 is a 16-foot, approximately 825 foot-long noise barrier located north of the westbound First Street off-ramp.
- SW4: The I-580 Westbound HOV Lane Project would extend existing noise barrier B (Table 2.2.4-2), located along Northfront Road/Sunflower Court, eastward along the right-of-way by approximately 310 feet to provide shielding for Category B land uses east of Central Avenue. The extension, known as SW4, will be 14 feet high.

The maps in Appendix A show the location of each barrier.

Noise measurements were conducted in November 2007 for the I-580 Westbound HOV Lane Project (EA 04-29082K) to document the noise environment at sensitive uses along the project corridor. These measurements were in addition to other measurements made for the I-580 Eastbound HOV Lane Project (May 2005) and Pleasanton General Plan update (September 2006). In September 2011, repeat measurements were taken at selected locations to verify that current noise levels were consistent with those measured previously. The measurement locations for each study were chosen to accurately represent areas of Category B land uses that would potentially benefit from lower future noise levels. The sites were also selected to minimize interference from non-traffic related noise sources. Noise measurement sites are depicted in Appendix A.

Following established methods for a traffic noise study, the short-term and long-term measurements, together with the measured traffic conditions, vehicle mix, and site-specific geographical information, were then used to determine future noise levels in the project area.

Calculated and measured noise levels were compared to assess any differences, to calibrate or validate the FHWA's Traffic Noise Model (TNM) for use in determining noise levels with and without the project, and to consider any applicable noise abatement measures.

Existing noise levels were estimated to approach or exceed the NAC at 76 receptor locations. The locations that may exceed the NAC with the project are discussed in Section 2.2.4.3.

2.2.4.3 Environmental Consequences

By providing a second express lane on eastbound I-580 between the Fallon Road/El Charro Road interchange and the North First Street interchange, the proposed project would essentially add a through lane to part of the project corridor. Therefore, it would qualify as a Type I project as defined in 23 CFR 772.7. Noise abatement must be considered for Type I projects if the project is predicted to result in a traffic noise impact. This section describes the results of the noise impact assessment that was performed for the proposed project.

A noise impact assessment is performed for the peak noise period. The noisiest hour is not necessarily the hour with peak traffic volumes. Congestion results in slower speeds, which substantially reduces traffic noise levels. The loudest hour is typically an hour where traffic flows freely at or near-capacity conditions.

Traffic Noise Modeling

I-580 currently operates at free-flowing capacity in both directions during at least some part of the day. This condition is predicted to persist in the future, therefore, free-flowing capacity traffic conditions were assumed for evaluation of existing and future noise levels. Under this assumption, LOS C traffic volumes are used, which correspond with the following traffic volumes:

- 1,800 vehicles per hour per lane for mixed through freeway lanes
- 1,500 vehicles per hour per lane for HOV lanes
- 1,400 vehicles per hour per lane for express lanes
- 1,000 vehicles per hour per lane for auxiliary lanes

Ramp volumes for the I-580 Eastbound HOV Project Noise Study were used. Where volumes exceed free-flowing capacity, a volume of 1,000 vehicles per hour per exiting or entering lane was used. The future No Build alternative includes the construction of the I-580 Eastbound and Westbound HOV Lane Projects (including Phase III of the I-580 Eastbound HOV Lane Project) and the Isabel Avenue/I-580 Interchange project. The future Build Alternative considered these projects in addition to the I-580 Eastbound Express Lanes Project. All freeway traffic was modeled at 65 mph for autos and light trucks, medium trucks and heavy trucks, and 45 mph for all on and off-ramps except loop ramps, which were modeled at 25 mph.

Noise Level Predictions

Noise levels were predicted for the four segments described below. Noise impacts were identified for outdoor use areas as well by the number of affected units, or receptors.[6] For all four segments described below, the project would result in a 0 to 2 dBA increase in noise levels from the slight shifting of lanes and the addition of a second express lane in part of the project corridor. The noise level increase would not be considered substantial (meaning a 12 dBA or more increase, as described in Section 2.2.4.1). Some locations are predicted to experience noise levels that approach or exceed the NAC. Noise abatement for those locations is described in Section 2.2.4.4.

Foothill Boulevard/San Ramon to Santa Rita Road. This segment has no sound walls and no nearby residential (Category B) receptors. Category C and Category E uses along this segment consist of hotels and outdoor recreational areas. The loudest-hour ($L_{eq(h)}$) existing (baseline) noise levels in this segment range from 45 to 78 dBA, with four of the 11 receptors approaching or exceeding the NAC. The future No Build and Build conditions would be the same as the existing (baseline) condition throughout this segment because the project would not change the roadway alignment. As a result, the noise level increase would be 0 dBA.

The four receptor locations that approach or exceed the NAC in this segment are all at the Dublin Sports Complex northeast of the I-580/I-680 interchange, along the westbound lanes of I-580 (R15, R16, R17, and P-ST01, a duplicate of R16; shown in Appendix A).

Santa Rita Road to Airway Boulevard. This segment has two existing noise barriers: Barrier E shields the residences along Annis Circle, and Barrier F shields the residences along Kirkcaldy Street and Pimlico Drive. The loudest-hour existing noise levels ($L_{eq(h)}$) in this segment range from 64 to 78 dBA. Under both future No Build and Build conditions, noise levels at the 17 receptor locations analyzed are expected to continue to range from 64 to 78 dBA $L_{eq(h)}$. The Build Alternative would not increase noise levels at any of the 17 locations. However, most first- and second-tier[7] residences along the eastbound lanes of I-580 are predicted to experience noise levels that approach or exceed the NAC. The locations that approach or exceed the NAC are described below and depicted in Appendix A:

- Multi-family residences (P-ST03, R1, R2, R3, and LT-3, a duplicate of R1) and single-family residences (R4, R5, R6, and R13) on Pimlico Drive;
- Single-family residences (P-LT01, R7, and Pleasanton GP LT37, a duplicate of P-LT01) on Kircaldy Court; and
- Single-family residences on Stacy Court (R8).

There are two golf courses along the south side of I-580 that experience high noise levels; however, golf is generally transitory in nature, and golf courses do not experience prolonged periods of human use that would benefit from a lowered noise level.

[6] For residential (Category B) land uses, each single-family or multi-family dwelling unit counts as one receptor. Category C, D, and E land uses are assigned numbers of receptors based on site-specific criteria that are described in the TNAP.

[7] The first and second rows of structures from the noise source being studied, in this case, I-580. The first tier is closest to I-580, and the second tier is behind the first tier and therefore farther from I-580.

Airway Boulevard to First Street. This segment has no sound walls and one noise barrier, a berm (Barrier D) that varies in varies in height between 12 and 15 feet and that shields the residences along Saddleback Circle. A 12-foot barrier (SW1) is to be constructed as part of the Isabel Avenue/I-580 Interchange project. SW1 will follow East Airway Boulevard from west of Barrier D to just east of the Portola overcrossing on the eastbound side of I-580. Predicted noise levels for No Build and Build conditions include the construction of SW1.

Land uses along this segment include residential (Category B), outdoor recreation areas (Category C), and hotels (Category E). The loudest-hour existing noise levels in this segment range from 51 to 79 dBA $L_{eq(h)}$. Under the future No Build condition, noise levels would continue to range from 51 to 79 dBA $L_{eq(h)}$. The future Build condition is anticipated to increase the loudest-hour noise levels at the 42 receptor locations in this segment by 0 to 2 dBA $L_{eq(h)}$ over future No Build conditions due to the shifting of the eastbound lanes and the addition of a second express lane. This increase is not considered substantial. However, most first- and second-tier receptors are predicted to experience noise levels that approach or exceed the NAC. In some areas, future noise levels will decrease due to construction of SW1, but some locations will still experience noise levels that approach or exceed the NAC. The locations that approach or exceed the NAC are described below and depicted in Appendix A:

- A hotel on Constitution Drive, north of I-580 (Comfort Inn, P-ST07);
- An outdoor recreation area on Kitty Hawk Drive, south of I-580 (Boomer's, R24 and R25);
- A single-family residential area southeast of the I-580/Isabel Avenue interchange (R23);
- Mobile homes (R30, R31, R32, R33, R35, R75, a duplicate of R30, ST-15, a duplicate of R32, and ST-16, a duplicate of R31), a park area (calibration points[8] ST-18 and ST-19, and P-ST08, a duplicate of ST-19), and single-family residences (calibration point LT-2, R26B, R29, R72, R73, calibration points ST-17 and ST-20, R26A, a duplicate of R26B, and R26, a duplicate of R72) in the area south of I-580 that is bordered on the north and east by East Airway Boulevard and on the west by Sutter Street;
- Multi-family residences on Paseo Laguna Seco, east of Portola Avenue and south of I-580 (R36, ST-14, and P-ST09, a duplicate of ST-14);
- Single-family residences on Las Colinas Road, north of I-580 (R39 and calibration points P-LT03 and ST-10); and
- Single-family residences on Las Positas Road, south of I-580 (R40 and R41).

First Street to Greenville Road. This segment has five existing noise barriers: Barrier A, which shields the residences along Almaden Way and Berryessa Street north of I-580; Barrier B, which shields the residences along Sunflower Court; Barrier C, which shields the residences along Sundance Road, north of I-580; SW2, which shields a mobile home park along Southfront Road east of Vasco Road; and SW3, a new wall north of the westbound First Street off-ramp. There is also a commitment to construct SW4 (EA 29082K), a 14-foot extension of noise barrier B, to

[8] Calibration points are locations used to check for consistency between measured existing noise levels and the levels generated by the traffic noise model that is used to predict future No Build and Build conditions.

provide shielding for residences to the east of Central Avenue. Future noise levels were predicted for No Build and Build conditions assuming the construction of SW4.

Land uses along this segment include residential (Category B), outdoor recreation areas and a school (Category C), and hotels (Category E). The loudest-hour existing noise levels in this segment range from 54 to 78 dBA $L_{eq(h)}$. Under the future No Build conditions, noise levels would continue to range from 54 to 78 dBA $L_{eq(h)}$. The future Build condition is anticipated to increase the worst noise-hour $L_{eq(h)}$ noise levels in this segment by 1 dBA or less over future No Build conditions. This minor increase would result from the slight shifting of lanes and the addition of the second express lane. The noise level increase is not considered substantial. However, most first- and second-tier receptors are predicted to experience noise levels that approach or exceed the NAC. The locations that approach or exceed the NAC are described below and depicted in Appendix A:

- A school west of Springtown Boulevard and north of I-580 (R42);
- A multi-family residence on Sunburst Lane, north of I-580 (R45);
- A mobile home park west of Sunflower Court and north of I-580 (R46, R50, ST-8, and P-LT05, a duplicate of ST-8);
- Single-family residences along Sunflower Court, west of Springtown Boulevard and north of I-580 (P-LT06, R52, R53, R54, R66, R67, and ST-6);
- Single-family residences along Southfront Road, between First Street and Vasco Road, south of I-580 (P-ST12, R47, R48, R65, and calibration point ST-13);
- Single-family residences along Northfront Road, west of Vasco Road and north of I-580 (R55 and R56).
- Single-family residences along Northfront Road, east of Vasco Road and north of I-580 (R58, calibration point ST-12, ST-11, a duplicate of R58, and P-ST13, a duplicate of ST-11); and
- A park on Northfront Road, west of Herman Avenue and north of I-580 (calibration point LT-1 and R60); and
- Mobile homes along Southfront Road, east of Vasco Road and south of I-580 (R62, calibration point P-ST14, R63, ST-4, and ST-5).

2.2.4.4 Avoidance, Minimization, and Abatement Measures

Traffic Noise Abatement Evaluation

Potential abatement measures were considered for receptors with noise levels that exceed state or federal thresholds and areas of frequent human use where a lowered noise level would be of benefit. According to the TNAP, noise abatement must be predicted to provide at least a 5 dB minimum reduction to be considered feasible. Additionally, the TNAP acoustical design goal states that the noise barrier must provide at least 7 dB of noise reduction at one or more benefited receptors. Noise abatement measures that provide noise reduction of more than 5 dB are encouraged as long as they meet the reasonableness guidelines. Reasonableness is determined

based on whether a proposed noise abatement measure is acceptable to the benefited receptors and the cost per benefited receptor. The cost is based on an allowance per benefited receptor of $55,000.

Potential noise abatement measures identified in the TNAP include:

- Avoiding the project impact by using design alternatives, such as altering the horizontal and vertical alignment of the project;
- Constructing noise barriers;
- Using traffic management measures to regulate types of vehicles and speeds;
- Acquiring property to serve as a buffer zone; and/or
- Acoustically insulating Activity Category D land uses (such as auditoriums, day care centers, hospitals, and libraries; Table 2.2.4-1).

The chosen abatement type for this project would be the construction of noise barriers in the form of sound walls. A preliminary noise abatement analysis was conducted that identified the feasibility of constructing new sound walls or replacing or modifying existing sound walls to reduce traffic noise levels.

Table 2.2.4-3 summarizes the results of the noise abatement analysis by segment (described in Section 2.2.4.3). For representative receptors where future noise levels would approach or exceed the NAC (described in Section 2.2.4.3), noise levels with and without the project are listed. Table 2.2.4-3 also lists the corresponding sound walls that were studied to provide noise abatement for those receptors, the wall heights analyzed, and the predicted noise levels at each receptor if the walls were constructed. The potential sound wall locations are depicted in Appendix A. For each sound wall that met the TNAP acoustical design goal (at least 7 dB of noise reduction at one or more benefited receptors), Table 2.2.4-3 also identifies the total reasonableness allowance for each sound wall and the estimated construction cost.

Of the 15 new and 5 modified sound walls analyzed, 12 had at least one wall height that would meet the noise reduction design goal of a 7 dB noise reduction at a minimum of one receptor location. The total reasonableness allowance for each feasible sound wall ranged from $55,000 to $825,000, depending on the wall height and number of benefited receptors. In all cases, the estimated construction costs of the walls well exceeded the combined reasonableness allowance for the benefited receptors. None of the sound walls evaluated meet both the feasibility and reasonableness criteria described at the beginning of Section 2.2.4.4; therefore, no sound walls will be built as part of this project.

Table 2.2.4-3: Noise Abatement Analysis Results

Foothill Blvd./San Ramon to Santa Rita Rd. Segment

***Sound Wall ID*:** **Receptor ID and Location**	**Noise Level (dBA)**			**Predicted Noise Level (dBA) w/Abatement (by wall height [ft])**				**Total Reasonable-ness Allowance**	**Construction Cost**	**Reasonable and Feasible?**
	Existing	**Predicted without Project**	**Predicted with Project**	**10**	**12**	**14**	**16**			
SWWB1 (new wall):										
R15 – Dublin Sports Complex	70	70	70	66	63	62	62	$385,000-$660,000	$1,900,000-$3,040,000	No
R16 – Dublin Sports Complex	74	74	74	67	66	65	64			
R17 – Dublin Sports Complex	78	78	78	69	67	67	66			

Santa Rita Rd. to Airway Blvd. Segment

***Sound Wall ID*:** **Receptor ID and Location**	**Noise Level (dBA)**			**Predicted Noise Level (dBA) w/Abatement (by wall height [ft])**				**Total Reasonable-ness Allowance**	**Construction Cost**	**Reasonable and Feasible?**
	Existing	**Predicted without Project**	**Predicted with Project**	**10**	**12**	**14**	**16**			
SWEB3 (increase height of existing wall):										
P-ST03 – Pimlico Dr.	72	72	72	[a]	70	68	67	NA	NA	No
P-LT01 – Kircaldy Ct.	70	70	70	[a]	69	68	67	NA	NA	No
R1 – Pimlico Dr.	70	70	70	[a]	69	67	66	NA	NA	No
R2 – Pimlico Dr.	70	70	70	[a]	69	67	66	NA	NA	No
R3 – Pimlico Dr.	72	72	72	[a]	70	70	67	NA	NA	No
R4 – Pimlico Dr.	71	71	71	[a]	69	67	66	NA	NA	No
R5 – Pimlico Dr.	71	71	71	[a]	69	67	66	NA	NA	No
R6 – Pimlico Dr.	71	71	71	[a]	69	68	67	NA	NA	No
R7 – Kircaldy Ct.	71	71	71	[a]	69	68	67	NA	NA	No
SWEB4 (new wall):										
R8 – Stacy Ct.	75	75	75	70	70	69	69	NA	NA	No
SWWB2 (new wall):										
R13– Pimlico Dr.	78	78	78	71	69	68	67	$55,000	$850,000-$1,360,000	No

Notes:
Shaded cells indicate that wall height does not meet the 7dB noise reduction goal and is therefore not considered reasonable.
Receptors listed in Section 2.2.4.3 that are not included in this table are duplicates of receptors in the table or sites used for model calibration.
[a] – Already protected by 10- to 12-foot sound wall
NA – Not applicable; noise reduction goal not met, so construction cost not estimated

Table 2.2.4-3: Noise Abatement Analysis Results

Airway Blvd. to First St. Segment

Sound Wall ID: **Receptor ID and Location**	**Noise Level (dBA)**			**Predicted Noise Level (dBA) w/Abatement (by wall height [ft])**				**Total Reasonable-ness Allowance**	**Construction Cost**	**Reasonable and Feasible?**
	Existing	**Predicted without Project**	**Predicted with Project**	**10**	**12**	**14**	**16**			
SWEB5 (new wall):										
R24 – Kitty Hawk Dr.	76	76	77	71	69	68	67	$220,000	$1,140,000-$1,520,000	No
R25 – Kitty Hawk Dr.	75	75	76	71	69	68	67			
SWEB6 (new wall):										
R23 – Southeast of Isabel IC	67	67	67	64	62	62	61	$605,000	$4,160,000	No
R26B – E. Airway/Sutter St.	67	67	67	63	62	61	60			
R29 – E. Airway/Sutter St.	68	68	69	66	65	64	64			
R30 – E. Airway/Sutter St.	71	71	71	68	68	67	67			
R31 – E. Airway/Sutter St.	71	71	70	69	68	68	68			
R32 – E. Airway/Sutter St.	69	69	69	69	69	69	69			
R33 – E. Airway/Sutter St.	65	65	66	65	65	65	65			
R35 – E. Airway/Sutter St.	68	68	69	66	66	66	65			
R72 – E. Airway/Sutter St.	66	66	67	64	63	62	62			
R73 – E. Airway/Sutter St.	66	66	66	65	64	63	62			
SWEB7 (new wall):										
ST-14 – Paseo Laguna Seco	67	67	68	64	63	62	61	$825,000	$1,925,000-$2,200,000	No
R36 – Paseo Laguna Seco	68	68	68	64	62	61	61			
SWEB8 (new wall):										
R40 – Las Positas Rd.	72	72	74	69	66	66	65	$110,000	$1,440,000-$1,920,000	No
R41 – Las Positas Rd.	73	73	74	68	65	64	64			
SWWB3 (new wall):										
P-ST07 – Constitution Dr.	73	73	73	70	69	67	66	$55,000	$1,120,000	No
SWWB4 (new wall):										
R39 – Las Colinas Rd.	69	69	69	65	64	64	63	NA	NA	No

Notes:
Shaded cells indicate that wall height does not meet the 7dB noise reduction goal and is therefore not considered reasonable.
Receptors listed in Section 2.2.4.3 that are not included in this table are duplicates of receptors in the table or sites used for model calibration.
NA – Not applicable; noise reduction goal not met, so construction cost not estimated

Table 2.2.4-3: Noise Abatement Analysis Results

First St. to Greenville Rd. Segment

***Sound Wall ID*: Receptor ID and Location**	**Noise Level (dBA)**			**Predicted Noise Level (dBA) w/Abatement (by wall height [ft])**				**Total Reasonable-ness Allowance**	**Construction Cost**	**Reasonable and Feasible?**
	Existing	**Predicted without Project**	**Predicted with Project**	**10**	**12**	**14**	**16**			
SWEB9 (new wall):										
R65 – Southfront Rd.	75	75	76	72	70	69	69	$55,000-$110,000	$800,000-$1,280,000	No
P-ST12 – Southfront Rd.	78	78	79	71	70	69	68			
SWEB10 (new wall):										
R47 – Southfront Rd.	72	72	73	66	66	65	65	$110,000	$1,100,000-$1,760,000	No
R48 – Southfront Rd.	73	73	73	67	66	65	65			
SWEB11 (increase height of existing wall):										
ST-4 – Southfront Rd.	65	65	66	[b]	[b]	65	65	NA	NA	No
ST-5 – Southfront Rd.	68	68	68	[b]	[b]	68	67	NA	NA	No
R62 – Southfront Rd.	69	69	69	[b]	[b]	69	68	NA	NA	No
R63 – Southfront Rd.	68	68	67	[b]	[b]	66	66	NA	NA	No
SWWB5 (new wall):										
R42 – W. of Springtown Blvd.	68	68	68	62	62	62	61	$55,000	$480,000	No
SWWB6 (increase height of existing wall):										
R45 – Sunburst Ln.	66	66	66	[c]	[c]	[c]	65[d]	NA	NA	No
SWWB7 (increase height of existing wall):										
ST-8 – W. of Sunflower Ct.	66	66	66	[c]	[c]	[c]	64[d]	NA	NA	No
R45 – Sunburst Ln.	66	66	66	[c]	[c]	[c]	66[d]	NA	NA	No
R46 – W. of Sunflower Ct.	66	66	66	[c]	[c]	[c]	65[d]	NA	NA	No
R50 – W. of Sunflower Ct.	66	66	66	[c]	[c]	[c]	66[d]	NA	NA	No
SWWB8 (increase height of existing wall):										
ST-6 – Sunflower Ct.	68	68	68	[b]	[b]	68	67	NA	NA	No
P-LT06 – Sunflower Ct.	68	68	68	[b]	[b]	68	68	NA	NA	No
R52 – Sunflower Ct.	67	67	67	[b]	[b]	66	65	NA	NA	No
R53 – Sunflower Ct.	69	69	69	[b]	[b]	68	67	NA	NA	No
R54 – Sunflower Ct.	69	69	69	[b]	[b]	68	68	NA	NA	No
R55 – Northfront Rd.	70	70	70	[b]	[b]	69	68	NA	NA	No
R66 – Sunflower Ct.	66	66	66	[b]	[b]	65	65	NA	NA	No
R67 – Sunflower Ct.	68	68	68	[b]	[b]	67	66	NA	NA	No
SWWB9 (new wall):										

Table 2.2.4-3: Noise Abatement Analysis Results

First St. to Greenville Rd. Segment

***Sound Wall ID*: Receptor ID and Location**	**Noise Level (dBA)**			**Predicted Noise Level (dBA) w/Abatement (by wall height [ft])**				**Total Reasonable-ness Allowance**	**Construction Cost**	**Reasonable and Feasible?**
	Existing	**Predicted without Project**	**Predicted with Project**	**10**	**12**	**14**	**16**			
R56 – Northfront Rd.	66	66	66	61	61	61	60	NA	NA	No
SWWB10 (new wall):										
R58 – Northfront Rd.	74	74	74	68	67	67	66	$165,000	$960,000-$1,280,000	No
SWWB11 (new wall):										
R60 – Northfront Rd.	76	76	76	71	69	69	69	$165,000	$1,080,000-$1,440,000	No

Notes:
Shaded cells indicate that wall height does not meet the 7dB noise reduction goal and is therefore not considered reasonable.
Receptors listed in Section 2.2.4.3 that are not included in this table are duplicates of receptors in the table or sites used for model calibration.
[a] – Already protected by 10- to 12-foot sound wall
[b] – Already protected by 12-foot sound wall
[c] – Already protected by 16-foot sound wall
[d] – A 16-foot sound wall is already in place in this location; noise level shown is for 18-foot sound wall
NA – Not applicable; noise reduction goal not met, so construction cost not estimated

Construction Noise Measures

Typically, work taking place within the Department right-of-way is not subject to local noise ordinances; however, the Department will work with the contractor to meet local requirements where feasible. The cities of Dublin, Livermore, and Pleasanton and Alameda County have either ordinances or General Plan polices that define construction activities and noise during specified daytime hours and on weekends.

Construction activities for the proposed project would be limited to restriping and installation of signs, toll structures, lighting, and utility equipment. Noise generated by project-related construction activities would be temporary, concentrated in specific areas over a period of several days to a few weeks. Construction noise would not exceed the existing hourly average traffic noise levels on I-580 (76 to 77 dBA $L_{eq(h)}$ day or night). Construction noise also would not exceed the quantitative noise limits established by the City of Pleasanton.

The following measures would minimize or reduce the potential for noise impacts resulting from project construction:

- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Locate stationary noise generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.
- Use “quiet” air compressors and other “quiet” equipment where such technology exists.
- Prohibit unnecessary idling of internal combustion engines within 100 feet of residences.
- Avoid staging of construction equipment within 200 feet of residences and locate all stationary noise-generating construction equipment, such as air compressors, portable power generators, or self-powered lighting systems as far practical from noise sensitive residences.
- Require all construction equipment to conform to Section 14-8.02, Noise Control, of the latest Department Standard Specifications.

2.2.4.5 CEQA Noise Analysis

The significance of a noise impact under CEQA is evaluated based on the difference between the baseline noise level and Build noise level. This assessment entails looking at the setting of the noise impact and how large or perceptible any noise increase would be in the given area.

The noise analysis described in Section 2.2.4.3 considered the noise setting of several receptor locations along the project corridor, which are identified by development type in Section 2.2.4.3 and by specific location in Appendix A. The analysis found that the differences between the baseline noise level and Build noise level ranged from 0 to 2 dBA. An increase of 2 dBA is considered to be barely perceptible to the human ear. Therefore, under CEQA, changes in traffic noise from the project would not result in a significant impact. (As described in Section 2.2.4.4, however, noise abatement has been considered under NEPA and 23 CFR 772.)

2.3 Biological Environment

All project activities would take place within existing pavement, in the median, or in areas previously disturbed by the I-580 Eastbound HOV Lane Project phases (EAs 29083_, 29084_ and 2908V_). The biological impacts of the I-580 Eastbound HOV Lane Project phases are described in the 2006 *Natural Environment Study,* 2006 *Biological Evaluation,* 2007 *Biological Assessment,* 2007 *Biological Opinion,* 2007 *Amendment to the Biological Opinion,* 2011 *Amendment to the Biological Opinion,* and 2012 *Amendment to the Biological Opinion.* The proposed project would not contribute additional impacts to biological resources.

To avoid additional impacts to designated habitat for listed species, the following construction activities will take place concurrently with construction of the I-580 Eastbound HOV Lane Project phases (EAs 29083_, 29084_ and 2908V_) through implementation of a Construction Change Order (CCO; hereafter referred as CCO work). The CCO work will be restricted to either the permanent impact footprint of the I-580 Eastbound HOV Lane Project phases or existing pavement or sidewalks. The CCO work will include the following project elements and construction activities:

- Trenching to allow for the placement of conduit, or placement of additional conduit in already-open trenches.
- Installation of service and controller cabinets and their concrete pad foundations. The footprint of the cabinets will be either 11.25 by 16 inches or 26 by 34 inches, depending on type. Based on the numbers and footprints identified, the total area of permanent disturbance from the cabinets is estimated to be less than 200 square feet.
- Installation of metal beam guard rails or concrete barriers to protect a small number of cabinet locations.

No maintenance vehicle pullouts or California Highway Patrol enforcement areas for the I-580 Eastbound Express Lanes Project are proposed in the biological impact areas identified for the I-580 Eastbound HOV Lane Project phases. If comments or recommendations from the Office of Traffic Safety result in the addition of pullouts in these areas, those features would also be constructed as part of the CCO work and would constitute additional structures within the project footprint of the I-580 Eastbound HOV Lane Project phases.

Conservation measures set forth in the United States Fish and Wildlife Service (USFWS) 2011 and 2012 amended Biological Opinions for the I-580 Eastbound HOV Lane Project (USFWS File No. 81420-2008-F-0495-R001-3, October 26, 2011; and USFWS File No. 81420-2008-F-0495-R002-1, July 2, 2012) will continue to be implemented during the CCO work. The amended Biological Opinions are included in Appendix D, Part D2.

In addition to the CCO work, construction of the I-580 Eastbound Express Lanes Project will include installation of overhead signs, toll structures, and lighting. The overhead signs and toll structures will be installed in already paved areas or in the median of I-580. The lighting will be installed on the overhead signs, toll structures, and lighting standards in the median. Staging and access associated with sign, toll structure, and lighting installation will be confined to the median. Work between the outer edge of pavement and the Department's right-of-way will not occur during the installation of the overhead signs, toll structures, and lighting.

Type 10 and/or Type 21D luminaires will be installed as part of the project, as discussed in Section 2.1.3.3. Shades and deflectors will be used on project-related lighting to avoid casting light past the outside edge of pavement. Special-status species habitat, riparian, aquatic or wetland features and crossing structures that could potentially provide habitat connectivity under I-580 will not be illuminated as part of the project.

As described in the *No Effect Determination for the I-580 Eastbound Express Lanes Project* (July 5, 2013) included in Appendix D, Part D2, the proposed project would contribute no impacts to the following resources:

- Natural Communities: Although natural communities are present within the right-of-way, project activities in these communities will be completed as part of the CCO work. The remaining construction activities will take place within paved and median areas that do not support natural communities. No impacts to natural communities would occur.
- Wetlands and Other Waters: No project work will occur within wetlands or other waters.
- Special-Status Plant Species: Although habitat for special-status plant species is present within the right-of-way, project activities in these areas will be completed as part of the CCO work. The remaining construction activities will take place within the paved and median areas that do not support habitat for these species. No impacts to special-status plants would occur.
- Special-Status Animal Species: Although habitat for special-status animal species is present within the right-of-way, project activities in these areas will be completed as part of the CCO work. A Caltrans biologist will conduct nesting bird surveys for work occurring between February 15 and September 1 to comply with the Migratory Bird Treaty Act.[9] The remaining construction activities will take place within the paved and median areas that do not support habitat for animal species. No impacts to special-status animals would occur.
- Federal and State Threatened and Endangered Species: Although habitat for federal and state threatened and endangered species is present within the right-of-way, project activities in these areas will be completed as part of the CCO work. The remaining construction activities will take place within the paved and median areas that do not support habitat for these species. In the terminology of the Federal Endangered Species Act, the project would have "No Effect" on threatened or endangered species.
- Invasive Species: All project activities would be restricted to the paved roadway surface or areas immediately adjacent to the roadway that have been previously disturbed by construction. No landscaping or importation of soil would occur.

[9] Preconstruction surveys will be conducted no more than three days before the start of ground disturbing activities. If the surveys indicate the presence of migratory bird nests where activities would directly result in bird injury or death, a buffer zone will be placed around the nest. The size of the buffer may vary for different species and will be determined in coordination with the California Department of Fish and Wildlife. A qualified biologist will delineate the buffer using ESA fencing, pin flags, and/or yellow caution tape. The buffer zone will be maintained around all active nest sites until the young have fledged and are foraging independently. In the event that an active nest is found after the completion of preconstruction surveys and after construction begins, all construction activities within a 50-foot radius will be stopped until a qualified biologist has evaluated the nest and erected the appropriate buffer around it.

2.4 Cumulative Impacts

2.4.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

California Environmental Quality Act (CEQA) Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under the National Environmental Policy Act (NEPA) can be found in 40 CFR, Section 1508.7 of the Council on Environmental Quality (CEQ) Regulations.

2.4.2 Affected Environment

The environmental analysis for the I-580 Eastbound Express Lanes Project was developed using accepted regional growth projections, land use forecasts, and programmed transportation improvements to forecast future conditions. The future conditions data provided the basis for the analyses for transportation (including traffic and transit), air quality, and noise. Therefore, those analyses already account for regional cumulative effects to transportation, air quality, and noise, including those from specific development and transportation improvement projects.

As cumulative effects are not always regional in scope, the I-580 Eastbound Express Lanes Project was analyzed to determine whether less-than-significant environmental effects that would be experienced locally could become significant when considered in combination with other reasonably foreseeable future projects in the project area. Large-scale transportation projects and other actions requiring federal approval are subject to laws and permit processes requiring consideration of and mitigation for impacts to publicly owned parkland, cultural resources, water quality, wetlands and waters of the U.S., and special-status species and their habitats. These laws and requirements are designed to assure that the impacts of such undertakings are fully mitigated and do not contribute to cumulative impacts.

Some types of local development projects are not subject to the same types of laws and permit requirements as federal actions. Therefore, the projects evaluated for cumulative impacts include local development projects that could contribute to the cumulative loss of resources in the project

corridor. The transportation and transit projects, private development projects, and other nontransportation projects considered for cumulative impacts are described in Table 2.4.2-1.

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
Transportation and Transit Projects				
I-580 Freeway Performance Initiative	230091/2014012002	From Patterson Pass in San Joaquin County to Greenville Road in Livermore, and from San Ramon Road in Dublin to Strobridge Avenue in Castro Valley	Install and implement ramp metering and traffic operations system; convert I-580/I-205 2-lane westbound connector to 1 HOV and 1 general purpose lane; widen Grant Line Road on-ramp to include 1 HOV and 1 general purpose lane.	Construction scheduled for 7/16 through 10/18
I-580 Roadway Rehabilitation Project	--/2014012001	I-580 mainline and ramps from 1 mile east of North Flynn Road to the San Joaquin County line in the eastbound direction and from the San Joaquin County line to 0.2 mile east of Greenville Road in the westbound direction	Replace roadway pavement and install rumble strips, metal beam guard rails, concrete barriers, overhead signage and lighting, flashing beacons, barrier markers, roadside delineators, and guard rail delineators.	Construction scheduled for 7/16 through 10/18
I-580 Isabel Avenue Interchange Project	230132/2005062129	At Isabel Avenue and I-580, between Jack London Boulevard and Portola Avenue, directly north of the SR 84 Expressway Widening Project.	Construct modified partial cloverleaf interchange, including a new bridge crossing I-580, roadway improvements on Isabel Avenue to Jack London Boulevard and local street improvements.	Under construction. Completed in 2011
Improve I-580 Isabel Avenue/SR 84 Interchange	230132/--	I-580/Isabel Avenue/SR 84	Complete improvements to provide six lanes over I-580 at the Isabel Avenue/SR 84 interchange and four lanes over I-580 at the Portola Avenue flyover.	Construction completed in 2013
SR 84 Pigeon Pass Safety Project	--/2004062018	On SR 84 between Ruby Hill Drive intersection and the Vallecitos Hills/Pigeon Pass area, directly south of the SR 84 Expressway Widening Project.	Upgrade SR 84 within the project limits to expressway design standards, roadway realignment, and addition of climbing lanes in the Pigeon Pass area.	Construction completed 2011

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
I-580 Eastbound HOV Lane Project	21116/2006092023	Along eastbound I-580 between Santa Rita Road and Greenville Road.	New eastbound High Occupancy Vehicle (HOV) lane from west of Santa Rita Road to east of Greenville Road; create eastbound auxiliary lanes between El Charro Road and Airway Boulevard and between First Street and Vasco Road; make median barrier and drainage improvements.	Construction completed November 2010
Phase III (EA 04-2908U1) of the I-580 Eastbound HOV Lane Project	240076/--	I-580/Isabel Avenue/North Livermore Avenue/First Street	Construct eastbound auxiliary lanes between Isabel Avenue and North Livermore Avenue and North Livermore Avenue and First Street and widen the Los Positas bridge.	Construction scheduled for 2012 to 2014
I-580 Westbound HOV Lane	22664,21116/2009032084	Along westbound I-580 between Greenville Road and San Ramon Road/Foothill Road.	New westbound HOV lane from Greenville Road to San Ramon Road/Foothill Road; new westbound auxiliary lanes between First Street and Isabel Avenue interchanges.	Construction scheduled for 2012 to 2014
I-580 Westbound Express Lane	22664/--	From Greenville Road to San Ramon Road/Foothill Road	Convert the proposed westbound HOV lane (described above) from peak period HOV-only use to express lane (HOV and toll) use.	Construction scheduled for 2013 to 2014
Widen I-580/I-680 interchange	230684/--	I-580/I-680 interchange	Widen the I-580/I-680 interchange in each direction to allow for express lanes.	Construction scheduled for 2029 to 2034
I-580/I-680 HOV Direct Connector	22765/--	I-580/I-680 interchange	Construct HOV direct connectors at I-580/I-680 interchange.	Proposed project
I-580/I-680 Improvements	230099/--	I-580/I-680 interchange (northbound I-680 to westbound I-580)	Provide a northbound I-680 to westbound I-580 connector and widen the existing westbound I-580 to southbound I-680 loop ramp.	Construction scheduled for 2017 to 2020
I-580 and Santa Rita Interchange Improvements	240144/--	I-580/Pimlico Drive	Reconstruct the southbound approach of Santa Rita at Pimlico/I-580 eastbound ramp to add a second southbound left turn loop.	Construction scheduled for 2018 to 2019

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
I-580 Eastbound Truck Climbing Lane Project	22013/--2009082067	I-580 from Greenville Road interchange to 1 mile east of North Flynn Road interchange	Widen I-580 to provide a truck climbing lane in the eastbound direction over the Altamont Pass from the Greenville Road interchange to ~1 mile east of the North Flynn Road interchange. The proposed project includes constructing three upslope retaining walls and addressing rock fall areas adjacent to the Altamont Sidehill Viaduct.	Construction scheduled for 2012 to 2014
I-580 and Fallon Road Interchange Improvements	--/2000082099	Fallon Road/El Charro Road	Reconfigure and improve the existing Interstate 580/Fallon Road-El Charro Road Interchange to increase capacity of the ramps and intersections.	Completed 2010
I-580 and Tassajara Road Interchange Improvements	--/2000032101	Fallon Road/El Charro Road	Reconfigure and improve the existing Fallon Road/El Charro Road interchange to increase capacity of the ramps and intersections.	Completed 2010
I-580 and Vasco Road Interchange	21100/2004082015	I-580/Vasco Road/ Northfront Road/ Preston Avenue	Widen I-580 overpass to provide 8 traffic lanes and bike lanes/shoulders; construct auxiliary lanes on I-580 between Vasco and First Street; add new loop ramp in southwest quadrant; widen Vasco Road to 8 lanes between Northfront Road and Las Positas Road; and other local roadway improvements.	Construction scheduled for 2022 to 2025
4-lane major arterial in Dublin	21473/--	Between Dublin Boulevard and North Canyon Parkway	Construct a 4-lane arterial connection between the future easterly end of Dublin Boulevard and the westerly end of North Canyons Parkway. A 2-lane connection could be constructed as an initial phase.	Construction scheduled for 2029 to 2031
Isabel Avenue/Vallecitos Road Intersection Realignment	--/2005042084	SR 84 at Vallecitos Road	Realign the existing Isabel Avenue/Vallecitos Road intersection by shifting the intersection to the northwestern quadrant of the existing intersection.	Completed 2006
State Route 84 Expressway Widening Project	22776/2007102077	SR 84 between Jack London Blvd. and Ruby Hill Drive	Widen State Route 84 and upgrade to expressway standards between approximately Jack London Boulevard and Ruby Hill Drive.	Construction scheduled for 2012 to 2014

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
Extend BART from the Dublin/Pleasanton Station to Livermore	240196/--2008062026	I-580 and Camino Tassajara, Isabel Avenue. Alignment east of Isabel Avenue not yet determined.	Extension of the existing alignment in the median of I-580 at the Dublin/Pleasanton BART Station eastward to Livermore.	EIR commenced Aug. 2012. Technical studies in support of EIR under way
Reconstruct I-580/First Street interchange	21475/--	I-580/First Street interchange	Reconstruct and modify interchange to improve safety and reduce congestion on and near the I-580/First Street interchange.	Construction scheduled for 2030 to 2035
Reconstruct I-580/Greenville Road interchange	21477/--	I-580/Greenville Road interchange	Reconstruct and modify interchange to improve safety and reduce congestion on and near the I-580/Greenville Road interchange	Construction scheduled for 2025 to 2035
Improve I-580/San Ramon Road/Foothill Road interchange	21489/--	I-580/San Ramon Road/Foothill Road interchange	Improve the I-580/San Ramon Road/Foothill Road interchange by the elimination of eastbound diagonal off ramp and eastbound loop off ramp. Construction of new signalized intersection for off ramp vehicles.	Expected construction 2012-2014
Tri-Valley Transit Access Project	230083/--	I-580 from Hacienda Drive to Greenville Road interchange	Identify and acquire right-of-way along the I-580 corridor from Hacienda Drive to Greenville Road interchange to accommodate a transit corridor in the median of I-580.	Construction scheduled for 2015 to 2040
Widen Greenville Road between I-580 and Patterson Pass	240254/--	Greenville Road between I-580 and Patterson Pass	Widen Greenville Road from 2-lanes to 4-lanes between I-580 and Patterson Pass Road.	Construction scheduled for 2018 to 2020

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
Nontransportation Projects				
Dublin				
Fallon Village Project	--/2005062010	Fallon Road and Croak Road	Construction of 1,078 residential units, a neighborhood square, neighborhood parks, an elementary school, and day care facilities. In addition, this project includes the following sub-projects: **Jordan Ranch**: Construction of 780 housing units, 12,000 square feet of commercial development, a community and neighborhood park, a school site, a water quality pond, and public trails. **Fallon Crossing**: Construction of 106 single-family residential units, interior streets, utilities, open space, a storm water detention basin and two water quality basins on 66.9 acres.	Construction began in 2011 Construction began in 2011; estimated completion of 2014 Construction began in 2011
Grafton Plaza	--/1991103064	Central Parkway between Tassajara Road and Fallon Road	Development of a mixed-use area (residential and commercial).	Approved June 2010; Construction completed in 2012
Nielsen Development Project	--/2008052117	Tassajara Road/Dublin Blvd.	Development of up to 34 lots with up to 36 single family and duplex dwellings along with an access road, on-site roads, grading and infrastructure extension on a 10.9 acre site.	Approved by City Council in May 2010
Emerald Vista Project (formerly Arroyo Vista Project)	--/2007122066	Dougherty Road, Amador Valley Blvd.	Demolition of the existing 150 public housing units and construction of a mixed-income complex of up to 378 dwellings, including a mix of ownership and apartment units. The project would also include an on-site day care facility, community center, parking and private recreation facilities.	Construction completed May 2013
East Dublin Properties	--/2001052114	Kohnen Way and Brannigan Street	Construction of a Springfield Montessori School, composed of a 16,002-square-foot building, parking lot, playground, landscaping and related improvements.	Project completed April 2010

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
Dublin Ranch	--/2009102025	Intersection of Fallon Road and Tassajara	Residential development of the following complexes: **The Groves**: 930 total units (587 affordable units, 322 senior apartments, 304 multi-family apartments) **Sorrento:** Medium density units, park and school site **Sonata:** Single-family detached homes	Senior and family apartments complete Construction began on western portion in 2011; Near completion as of November 2012 Complete
The Green at Park Place Retail Center		Southwest corner of Hacienda Drive and Martinelli Way	Construction of a 305,000-square-foot retail commercial shopping center on 27.5 acres.	Proposed, Tentative map and site development review approved August 2008
Promenade Parcel Map/Club Sport		Northeast corner of Grafton Drive and Dublin Drive	Club Sport/Mercantile building and parking structure on 3.5 acres.	Approved as of November 2012.
West Dublin BART Hotel and Retail		6600 Golden Gate Drive	Construction of 150-room hotel and 7,500 square foot retail center.	Approved in 2004. Currently on hold.
Kia Vehicle Sales and Service Dealership		4300 John Monego Court	13,720 square foot automobile dealership and related improvements	Construction completed
Tralee	--/2004079062	Dublin Blvd & Dougherty Road	33,500 commercial neighborhood: 103 townhouse units; 130 condominiums	Mixed use complete, townhouses under construction
Dublin Gateway Medical Center	--/2007069036	4000 – 4050 Dublin Boulevard	Phase I: 120,000 square foot medical center. Phase II: 58,000 square foot medical office and parking garage OR 100 bed hospital and parking garage.	Phase I complete, Phase II amendment approved June, 2007.
Fallon Gateway	--/1991103064	SW Corner of Fallon Road & Dublin Boulevard	370,000 square foot retail commercial center.	Approved September, 2010. Construction in progress.

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
Dublin Security Storage		6005/6015 Scarlett Court	Mini-storage expansion and zoning ordinance amendment to allow mini storage in the M-1 zoning district.	Approved December, 2010. In building plan check.
Valley Christian Center Sanctuary		7500 Inspiration Drive	15,700 square foot sanctuary	Under construction
580 Executive Center	--/2013032026	11501 Dublin Boulevard	Parking lot expansion and future pad building.	In planning review.
Fountainhead Montessori		6665, 6670, 6690 Amador Plaza Road	Expansion of existing preschool including a new elementary school.	In planning review.
Schaefer Ranch		North side of I-580 adjacent to western city limits boundary	406 single-family detached homes.	Site development review approved for 140 homes.
Espirit @ Dublin Station	--/2010088365	SE corner of Dublin Boulevard and Iron Horse Parkway	300 condominium units and 15,000 square feet of retail commercial or 105 townhomes	Approved November, 2010
Avalon II at Dublin Station		North of I-580 between DeMarcus Boulevard and Iron Horse Parkway	486 apartment units and 10,000 square feet of retail commercial use	255 units under construction
Essex Apartments		6600 Golden Gate Drive	309 condominium units	Approved December, 2007. Under construction.
The Summit at Schaefer Ranch		Kelly Canyon Court	66 single family dwelling units	Under construction
Kingsmill Group Residential Project		6707 Golden Gate Drive	76 affordable residential units	Pre-application
Livermore				
Oaks Business Park Development	--/2001032069	West side of SR 84, between Jack London Boulevard and Isabel Avenue	178-acre site graded and subdivided into 35 parcels zoned for technical/light industrial development. New access on Discovery Drive will connect to SR 84 at a signalized intersection.	Under construction; Phase 1 (including Discovery Drive) completed late 2007

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
Los Positas College Development Plan	--/2006012123	Collier Canyon Road	Modernize the campus, upgrade existing facilities and construct new facilities in response to projected enrollment growth. The Plan is designed to accommodate an enrollment capacity of 9,700 students and 515 staff by 2020.	Construction of the Student Services and Administration Buildings began in August 2011. Completed in 2013
Arroyo Vista Neighborhood Plan	--/2007052028	Southeast corner of intersection of Arroyo Vista and Las Positas roads	Residential development on a vacant 28-acre infill site on the southeast side of Arroyo Vista and Las Positas roads.	Construction began in 2011
El Charro Specific Plan for development of regional commercial use	--/2006052112	El Charro Road/ I-580	Development of regional commercial uses on approximately 150 acres of the project area. The project also includes a specific commercial retail development on approximately 42 acres of the Specific Plan Area directly adjacent to and east of El Charro Road.	Construction of the first development began in August 2011. Expected completion in November 2012.
Vineyard Memorial Cemetery	--/2006072064	North Livermore Avenue, I-580, Hartman Road, Hartford Road	Development of a phased cemetery, mortuary, mausoleum, caretaker's residence, main residence, and manager's residence on a 44-acre portion of a 110-acre site.	Proposed
Pleasanton				
Stoneridge Creek (Stoneridge Drive Specific Plan Amendment/Staples Ranch)	--/2006062053	I-580 and El Charro Road	Development of 124 acres of undeveloped land. Development includes a 46-acre senior continuing care community, a 37-acre auto mall, an 11-acre retail/commercial center, a 5-acre neighborhood park and a 17-acre community park.	Grading Permit issued August 2011. Phase I proposed completion by the end of 2012
Ponderosa Homes	--/2006062080	3157 Trenery Drive and 2313 Martin Avenue	Development of 19.83 acres into 25 one- and two-story residential units south of I-580.	Approved in 2011. Construction began in August 2012.
Kolb Ranch Estates		11393 Dublin Canyon Rd	12 large lot single family units	Development plan approved in 2000. Growth management plan approved.
Windstar Communities		6110 Stoneridge Mall Road	350 apartment units	Development plan approved in 2007. Growth management plan approved.

Table 2.4.2-1: Other Nearby Improvements Considered for Cumulative Impacts, continued

Project	RTP/SCH Number	Location	Description	Anticipated Schedule
BRE Properties		Gibralter & Hacienda Drive	255 Apartment unit development	Development plan approved in 2012. Growth Management Program approval.

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2.4.3 Environmental Consequences

2.4.3.1 Land Use, Community Resources, and Growth

Several of the recently completed and proposed development projects listed in Table 2.4.2-1 added or will add residential units or commercial, retail, industrial, and institutional land uses along the I-580 corridor. As the I-580 Eastbound Express Lanes Project is limited to the existing freeway right-of-way, it would not overlap geographically or combine with the other projects to create adverse cumulative impacts to land use or community resources.

As discussed at the beginning of Chapter 2, the proposed project would not substantially change roadway capacity or serve any new areas not already accessible by existing interchanges; therefore, it would not combine with other projects to result in cumulative impacts related to growth.

2.4.3.2 Utilities and Emergency Services

Installation of conduits for the I-580 Eastbound Express Lanes Project could overlap in time and proximity with utility work for Phase III of the I-580 Eastbound HOV Lane Project (RTP No. 240076, EA 04-2908U1). Construction and utility work for the two projects will be coordinated, and neither project will disrupt utility services. Emergency services access will be maintained during construction for both projects. None of the other projects listed in Table 2.4.2-1 would overlap in time and proximity with the proposed projects; therefore, no cumulative impacts would occur.

2.4.3.3 Traffic and Transportation/Pedestrian and Bicycle Facilities

The traffic analysis for the I-580 Eastbound Express Lanes Project included growth projections from ABAG forecasts and was validated for updated projections through 2035 (see Section 2.1.2.1). The development projects listed in Table 2.4.2-1 have the potential to increase local traffic. The additional traffic from these developments has been accounted for in the growth forecasts used for the traffic analysis and would not change the conclusions of the transportation analysis.

Construction of the I-580 Eastbound Express Lanes Project could overlap in time and proximity with Phase III of the I-580 Eastbound HOV Lane Project (RTP No. 240076, EA 04-2908U1) and the I-580 Westbound Express Lane from Greenville Road to Foothill Road (RTP No. 22664). Construction of each project would require full or partial lane and shoulder closures. These

closures could result in short-term, temporary impacts during project construction. In accordance with Departmental standard practice, construction of the projects will be coordinated to avoid traffic disruptions, and each project will include preparation of a TMP to minimize traffic disruptions from project construction. The TMPs will provide for public outreach to inform the public of the times and locations of upcoming construction, construction signage in and approaching the project area, and incident management for traffic control in the vicinity of construction activities. With implementation of the TMPs, no substantial adverse cumulative impacts are anticipated.

2.4.3.4 Visual/Aesthetics

The recently completed and proposed development projects listed in Table 2.4.2-1 have added or will add residential, commercial, retail, industrial, and institutional land uses along the I-580 corridor. The development will result in changes to the visual quality of the area along I-580, which is currently moderate. As the developments are subject to the community character and aesthetic standards set forth in the Dublin, Pleasanton, and Livermore general plans, major adverse visual effects are not expected. However, the developments as a whole, which are either directly adjacent to I-580 or within less than 0.25 mile, would add to the urbanized character of the freeway corridor.

The I-580 Eastbound Express Lanes Project would not affect any vegetated areas, change the appearance of eastbound I-580 other than restriping lanes and adding overhead signs, toll structures, and lighting, or affect a scenic highway or corridor designation or eligibility. Views of the proposed roadway signage and other apparatus would be consistent with existing signage as well as views of the recently completed and proposed development along the freeway corridor. Although the proposed project would be in the same general viewshed as the development projects listed in Table 2.4.2-1, no substantial cumulative effects would occur.

Construction of the I-580 Eastbound Express Lanes Project could overlap in time and proximity with Phase III of the I-580 Eastbound HOV Lane Project (RTP No. 240076, EA 04-2908U1) and the I-580 Westbound Express Lane from Greenville Road to Foothill Road (RTP No. 22664). Visual effects from construction of the three projects would be minor and short-term, as the estimated construction duration for each project is 1.5 years.

The overhead signage, toll structures, and lighting for the I-580 Eastbound Express Lanes Project combined with that of the I-580 Westbound Express Lane from Greenville Road to Foothill Road (RTP No. 22664) would permanently increase the amount of overhead roadway apparatus in the study corridor. Section 2.1.3.3 describes the overhead features associated with the eastbound express lanes project. The I-580 Westbound Express Lane Project would add a slightly greater number of overhead structures in the median than the I-580 Eastbound Express Lanes Project, because the project length of the westbound express lane is longer than the proposed eastbound project (the western terminus is near Foothill Road instead of Hopyard Road/Dougherty Road). The lighting is not expected to result in light intrusion or glare (Section 2.1.3.3), and the proposed signage and toll structures would be consistent with the existing roadway apparatus, urbanization, and proposed development throughout the corridor. In addition, during the design phase for the I-580 Westbound Express Lane Project, the Department and Alameda CTC can explore opportunities for consolidating signage for the eastbound and westbound direction to

reduce the overall number of signs in the corridor. No substantial adverse cumulative impacts would occur.

2.4.3.5 Air Quality

As noted in Section 2.1.2.1, traffic changes through 2035 were accounted for in the traffic study for the I-580 Eastbound Express Lanes Project, which was the basis for the modeling and analysis of air quality impacts. Therefore, regional and local increases in traffic have already been used to evaluate these impacts, and the local development projects listed in Table 2.4.2-1 fall well within the growth projections used in these studies. In addition, the I-580 Eastbound Express Lanes Project is considered to meet regional air quality conformity requirements because it is included in a current TIP and RTP. The TIP and RTP undergo a cumulative transportation project, land use growth, and air quality evaluation. No long-term cumulative impacts related to air quality anticipated.

Each of the cumulative projects identified in Table 2.4.2-1 would have temporary air quality and noise impacts, including dust and diesel emissions from construction equipment and activities. Construction of the I-580 Eastbound Express Lanes Project could overlap in time and proximity with Phase III of the I-580 Eastbound HOV Lane Project (RTP No. 240076, EA 04-2908U1) and the I-580 Westbound Express Lane from Greenville Road to Foothill Road (RTP No. 22664). None of the projects would take more than 1.5 years to construct, and no cumulative construction-related particulate emissions would occur. Due to the limited nature of construction activities for the I-580 Eastbound Express Lanes Project, construction emissions would be less than significant and would not contribute appreciably to cumulative air quality impacts.

2.4.3.6 Noise

The noise analysis described in Section 2.2.4.4 found that the differences between the baseline noise level and Build noise level ranged from 0 to 2 dBA, due to the slight shifting of lanes and the addition of a second express lane. An increase of 3 dBA is considered to be barely detectable to the human ear. The project would not result in a substantial project-related noise level increase with respect to NEPA or CEQA. Some receptor locations would have noise levels that are predicted to approach or exceed the noise abatement criteria established in 23 CFR 772. A traffic noise abatement evaluation following Department procedures was performed for those locations and identified feasible sound walls, but none were determined cost-effective.

The noise model used traffic volume data from the traffic projections developed for this project. The traffic data accounted for growth projections through 2035 from Association of Bay Area Governments forecasts. The development projects listed in Table 2.4.2-1 have the potential to increase noise in the project vicinity. The additional traffic from these developments has been accounted for in the growth forecasts used for the traffic analysis and would not change the conclusions of the analysis.

As with the proposed project, the future transportation projects identified in Table 2.4.2-1 will be required to analyze project-related traffic noise in accordance with the Protocol (Caltrans 2011) and evaluate abatement, if feasible and reasonable. The nontransportation projects identified in Table 2.4.2-1 would be required to comply with local ordinances with respect to noise abatement. As the proposed project accounted for future growth through 2035 and was found to

not result in substantial adverse noise impacts, it is not expected to contribute to adverse cumulative noise impacts.

2.5 Climate Change (CEQA)

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light duty trucks, other trucks, buses, and motorcycles make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO2, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).[10]

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improving the transportation system and operational efficiencies, 2) reducing activity, 3) transitioning to lower GHG-emitting fuels, and 4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued cooperatively.[11] The following Regulatory Setting section outlines state and federal efforts to comprehensively reduce GHG emissions from transportation sources.

2.5.1.1 Regulatory Setting

State

With the passage of several pieces of legislation including State Senate and Assembly bills and Executive Orders, California launched an innovative and proactive approach to dealing with GHG emissions and climate change.

Assembly Bill 1493 (AB 1493), Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to

[10] http://climatechange.transportation.org/ghg_mitigation/
[11] http://www.fhwa.dot.gov/environment/climate_change/mitigation/

reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

Executive Order (EO) S-3-05(June 1, 2005): The goal of this EO is to reduce California's GHG emissions to 1) year 2000 levels by 2010, 2) year 1990 levels by 2020, and 3) 80 percent below the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32 (AB 32), Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Senate Bill 97 (SB 97) Chapter 185, 2007, Greenhouse Gas Emissions: This bill required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board (CARB) to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 (SB 391) Chapter 585, 2009 California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.

Federal

Although climate change and GHG reduction are a concern at the federal level, currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (USEPA) nor the Federal Highway Administration (FHWA) has explicit guidance or methods to conduct project-level GHG analysis.[12] FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many

[12] To date, no national standards have been established regarding mobile source GHGs, nor has USEPA established any ambient standards, criteria or thresholds for GHGs resulting from mobile sources.

planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies outlined by FHWA to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and EO 13514 - *Federal Leadership in Environmental, Energy and Economic Performance.*

Executive Order 13514 (October 5, 2009): This order is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

USEPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, USEPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and USEPA's assessment of the scientific evidence that form the basis for USEPA's regulatory actions. USEPA in conjunction with NHTSA issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.[13]

The USEPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

The final combined that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

On August 28, 2012, USEPA and NHTSA issued a joint Final Rulemaking to extend the national program for of coordinated greenhouse gas and fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this

[13] http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq

program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

The complementary USEPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (semi trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO2 emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

2.5.1.2 Project Analysis

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of GHG.[14] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, the ARB released the GHG inventory for California (forecast last updated: October 28, 2010). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented (see Figure 2.5.1-1). The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

[14] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

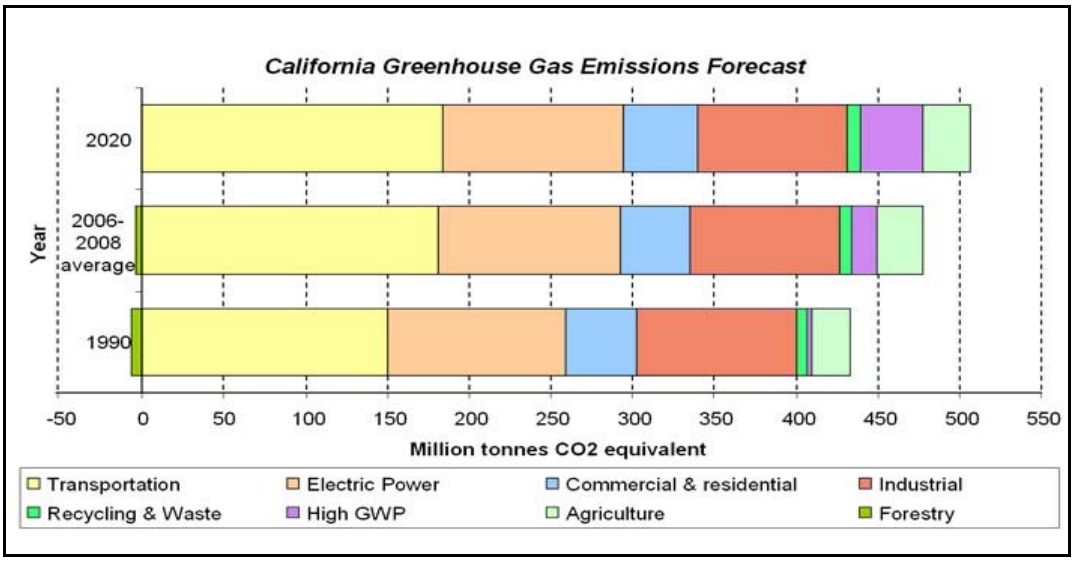

Figure 2.5.1-1. California Greenhouse Gas Forecast

Source: *http://www.arb.ca.gov/cc/inventory/data/forecast.htm*

The Department and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, the Department has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.[15]

One of the main strategies in the Department's Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide (CO_2) from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0-25 miles per hour (see Figure 2.5.1-2 below). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO_2, may be reduced.

[15] Caltrans Climate Action Program is located at the following web address: http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

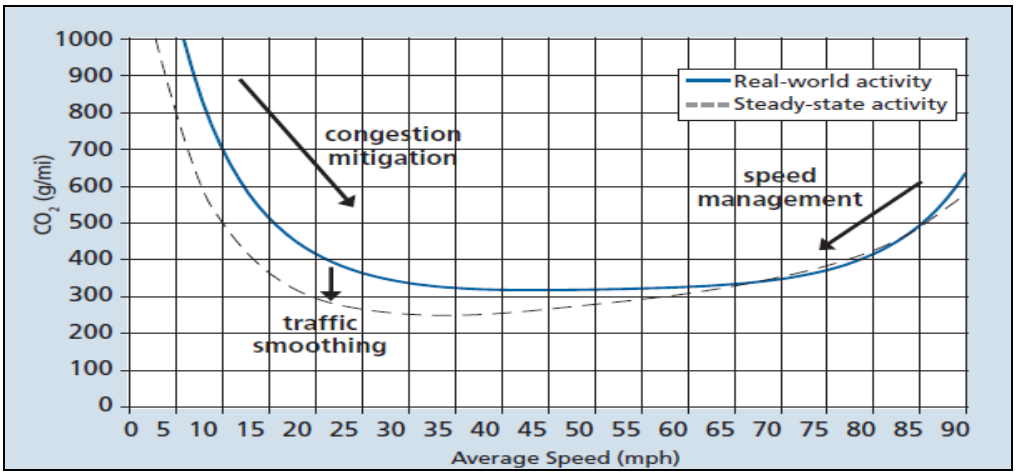

Figure 2.5.1-2. Possible Effect of Traffic Operation Strategies in Reducing On-Road CO_2 Emission[16]

The proposed project has been designed to decrease future delays and travel times and increase vehicle speeds throughout the project corridor. Allowing solo drivers to pay to use the express lanes would shift some traffic out of the general purpose lanes, contributing to improved operations and reduced congestion. The second express lane would expand freeway capacity for HOVs for part of the project corridor, and express lane tolls would provide an additional funding source for public transit in the corridor.

The project is also included in the 2013 RTP (ABAG and MTC 2013, RTP ID 240050) and 2013 TIP (MTC 2013, page S3-100, TIP ID ALA070020), which contain adopted strategies for greenhouse gas emissions from transportation sources. Specifically, RTP reference number 230550, "Climate Initiatives Program," is an adopted 5-year program for the Bay Area region involving outreach and education, promotion of safe routes to school, bikesharing, and funding for electric vehicles. The adopted TIP also demonstrates that the region will remain below all approved "vehicle emission budgets" through the RTP study year.

CO_2 emissions estimated for the Existing/Baseline, No Build, and Build conditions were based on the EMFAC2011 model. The vehicle miles traveled (VMT) per day and per year for opening year 2015 and horizon year 2035 are projected to increase when comparing the Build vs. No Build scenarios in both the 2015 and 2035 analysis years. Both future Build and No Build scenarios are projected to result in higher VMT per day and year compared to the Existing/Baseline scenario.

However, the average speeds are expected to increase for the Build scenario compared to the No Build scenario in 2015 and 2035 and the Existing/Baseline scenario in 2005.The speeds used in the emissions model and shown in Table 2.5.1-1 represent the worst-case peak hour speeds for the worst-case mainline sections along the I-580 corridor within the project limits. The VMT, associated speeds, and CO_2 emissions for years 2005, 2015, and 2035 are presented in Table 2.5.1-1.

[16] Traffic Congestion and Greenhouse Gases: Matthew Barth and Kanok Boriboonsomsin (TR News 268 May-June 2010)<http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf>

Table 2.5.1-1: Daily and Annual CO_2 Emissions for Existing/Baseline (2005) and Future No Build and Build Alternatives (2015 and 2035)

Condition	Peak Hour Speeds (mph)	Daily VMT	Annual VMT	Daily CO_2 emissions (pounds/day)	Annual CO_2 emissions (tonnes/yr)
Existing / Baseline (2005)	28.7 – 37.5	1,512,524	552,071,219	1,524,373	252,377
No Build (2015)	29.0 – 53.8	1,645,112	600,466,030	1,258,924	208,429
Build (2015)	51.8 – 55.8	1,653,675	603,591,354	1,260,728	208,727
No Build (2035)	12.7 – 54.7	1,824,749	666,033,365	1,354,152	224,195
Build (2035)	48.3 – 54.6	1,954,562	713,415,152	1,143,345	189,293

Although VMT is expected to continue to increase in the future Build and future No Build scenarios due to improved travel times, CO_2 emissions are expected to decrease when comparing the future Build scenario to the Existing/Baseline and future No Build scenarios.

It should be noted that the numbers in Table 2.5.1-1 are not necessarily an accurate reflection of what the true CO_2 emissions will be because CO_2 emissions are dependent on other factors that are not part of the model such as the fuel mix, rate of acceleration, and the aerodynamics and efficiency of the vehicles. EMFAC model emission rates are only for direct engine-out CO_2 emissions not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components. (The EMFAC2011 emissions estimate used the CO_2 emission factors that incorporate the Pavley I and Low Carbon Fuel Standard regulations.) The CO_2 emissions presented in Table 2.5.1-1 are only useful for a comparison among the Existing/Baseline, No Build, and Build scenarios and should not be considered independently.

Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by on-site construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

As project construction would be limited to restriping and installation of signage, toll structures, lighting, and utility equipment, construction GHG emissions are not quantified and are expected to be minimal. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. Measures to reduce construction emissions are listed in Section 2.2.3.4 and include maintenance of construction equipment and vehicles, limiting of construction vehicle idling time, and scheduling and routing of construction traffic to reduce engine emissions.

CEQA Conclusion

While the project will result in a slight increase in GHG emissions during construction, it is anticipated that the project will not result in any increase in operational GHG emissions. While it

is Caltrans' determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in Section 2.5.1.3.

2.5.1.3 Greenhouse Gas Reduction Strategies

The Department continues to be involved on the Governor's Climate Action Team as the ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies the Department is using to help meet the targets in AB 32 come from then Governor Arnold Schwarzenegger's Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in Figure 2.5.1-3: The Mobility Pyramid.

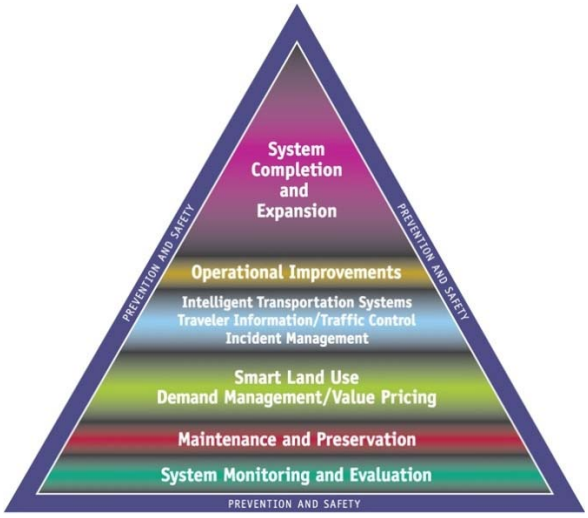

Figure 2.5.1-3. The Mobility Pyramid

The Department is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. The Department works closely with local jurisdictions on planning activities but does not have local land use planning authority. The Department assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; the Department is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by participating on the Climate Action Team. It is important to note, however, that control of the fuel economy standards is held by the USEPA and ARB. The Department is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under

Senate Bill (SB) 375 (Steinberg 2008), SB 391(Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32.

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future, statewide, integrated, multimodal transportation system. The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs.

Table 2.5.1-2 summarizes the Departmental and statewide efforts that the Department is implementing to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Table 2.5.1-2: Climate Change/CO_2 Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings Million Metric Tons (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Transportation System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.07	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, ARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	CalEPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

Notes: BT&H = Business, Transportation and Housing, CalEPA = California Environmental Protection Agency, ARB = California Air Resources Board, CEC = California Energy Commission, MMT = million metric tons, MPOs = Metropolitan Planning Organizations

The following measures will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

- The Department and the CHP are working with regional agencies to implement intelligent transportation systems (ITS) to help manage the efficiency of the existing highway system. ITS is commonly referred to as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.
- The project will include an additional (second) express lane from the Fallon Road/El Charro Road interchange to the North First Street interchange (approximately 6 miles of the 12.1-mile project corridor). The lane will be restricted to HOVs and toll-paying vehicles. In addition, two park and ride facilities are located along I-580 within the project limits to help manage the growth in demand for highway capacity.
- The project would incorporate the use of energy efficient lighting, which will be defined during project design.

2.5.1.4 Adaptation Strategies

"Adaptation strategies" refer to how the Department and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011[17], outlining recommendations to President Obama for how Federal Agency policies and programs can better prepare the U.S. to respond to the impacts of climate change. The Progress Report of the Interagency Climate Change Adaptation Task Force recommends that the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks change.

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and

[17] http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation

biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, then Governor Arnold Schwarzenegger signed EO S-13-08 which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop. The California Climate Adaptation Strategy (Dec 2009),[18] which summarizes the best-known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The National Academy of Science to prepare was directed a Sea Level Rise Assessment Report to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.
- The range of uncertainty in selected sea level rise projections.
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems.
- A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by the Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

[18] http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data.

All projects that have filed a Notice of Preparation as of the date of EO S-13-08, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. The proposed project has been programmed for construction during the 2008–2013 time frame and is exempt from requirement to consider sea level rise. However, the proposed project is outside the coastal zone and direct impacts to transportation facilities due to projected sea level rise are not expected.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. The Department continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Currently, the Department is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change effects, the Department has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Department will be able review its current design standards to determine what changes, if any, may be needed to protect the transportation system from sea level rise.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

Potential effects of climate change to the project and its immediately surrounding area are unknown, but unlikely. The project area is well inland and unlikely to experience seawater intrusion. It is located within an existing paved highway median, and would not be subject to erosion from increased storm water runoff.

Chapter 3 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation, the level of analysis required, and to identify potential impacts and mitigation measures and related environmental requirements.

3.1 Initial Project Development

The proposed project has been presented during the public outreach phase of MTC's regionwide express lanes network study. It has also been discussed at some of the major public outreach meetings held for I-680 Southbound Express Lane Project.

Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including a focus group discussion, meetings with stakeholders (Chamber of Commerce and members of the business community), city council meetings, ground breaking ceremonies, Alameda CTC Policy Advisory Committees meetings, and other public outreach meetings.

Public notification for the I-580 express lane began in 2008 during the public groundbreaking ceremony for the I-580 HOV lane, when Alameda County Supervisor Scott Haggerty described the project as a planned express lane. Formal outreach within the I-580 corridor began on September 15, 2009, with a presentation to a meeting of the Pleasanton City Council including a video of the I-580 express lane operations and question and answer (Q&A) with those present. The city council meeting was open to and attended by the public, with the express lane presentation as a listed element of the agenda. In addition, the meeting was broadcast on the city's cable television station. The presentation received page 1 coverage in the *Pleasanton Weekly* newspaper edition of September 25, 2009.

Outreach with community organizations along the I-580 corridor began with a presentation to the Pleasanton Chamber of Commerce breakfast meeting of November 12, 2009. The presentation was similar to the presentation to the city council two months earlier. In addition, the project has been listed several times on the agenda of the Alameda CTC Policy Advisory Committee, which includes the mayors of local cities. The I-580 Eastbound Express Lanes project was also presented at the Alameda County Transportation Improvement Authority's east county transportation forums held in April 2010 and April 2011.

Public input on the project was solicited during the review period for this document, as described further in Section 3.2.

3.2 Circulation, Review, and Comment on the Draft Environmental Document

This IS/EA was made available for public review from January 6, 2014, through February 5, 2014. The public was notified of the availability of the IS/EA and of the public meeting for the proposed project by the following methods.

- Advertisements were placed in the *Tri-Valley Herald,* a daily, on January 5 and 8, 2014; the *Livermore Independent,* a weekly, on January 9, 2014; and the *Pleasanton Weekly* on January 10, 2014.

- The Alameda CTC issued a press release on January 6, 2014.
- On January 6, 2014, notices were placed on http://www.alamedactc.org/ under "Latest News" and http://www.alamedactc.org/news_items/view/12701, and the IS/EA was posted to http://www.dot.ca.gov/dist4/envdocs.htm.
- Social media postings were made to the Alameda CTC and 680 Express Lane Facebook pages on January 6 and 22, 2014.
- Twitter announcements were made via @AlamedaCTC on January 6, 14, and 22, 2014.
- In addition, items regarding the availability of the IS/EA and the public meeting appeared in the following news outlets and web sites:
  - *Contra Costa Times,* January 7, 2014;
  - *Modesto Bee,* January 17, 2014;
  - *Stockton Record,* January 22, 2014;
  - Around Dublin blog, January 16, 2014;
  - Dublin Patch, January 16, 2014;
  - Livermore Patch, January 10 and 16, 2014;
  - NavBug, January 16, 2014; and
  - City of Livermore website.

Printed copies of the IS/EA were made available for public inspection at following locations:

- Department of Transportation District 4 Office, 111 Grand Avenue, Oakland, CA
- Alameda County Transportation Commission, 1111 Broadway, Suite 800, Oakland, CA
- Dublin Public Library, 200 Civic Plaza, Dublin, CA 94568
- Livermore Public Library, Civic Center Branch, 1188 South Livermore Avenue, Livermore, CA 94550
- Pleasanton Public Library, 400 Old Bernal Avenue, Pleasanton, CA 94566

On January 22, 2014, the Department and Alameda CTC held a public meeting to share information about the project and collect comments on the IS/EA from interested parties. The meeting was from 5:00 PM to 7:00 PM at the Dublin Unified School District Board Room, 7471 Larkdale Avenue, Dublin, CA 94568. Exhibits illustrating the project and design features were on display, and team members were available to answer questions. Approximately 13 members of the public attended. Comments received during the meeting and public review period are presented in Appendix I, along with the Department's responses.

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This document and its related technical studies were prepared under the supervision of Caltrans District 4. The Project Development Team (PDT) was responsible for oversight of the project and consists of representatives from Caltrans and Alameda CTC.

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