

Interstate 680 Express Lanes from State Route 84 to Alcosta Boulevard Project

ALAMEDA COUNTY AND CONTRA COSTA COUNTY, CALIFORNIA

04-ALA-680 – PM R10.6/R21.9

04-CC-680 – PM R0.0/1.1

EA 04-0Q3000 / Project ID 0418000069

Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment



**Prepared by the
State of California, Department of Transportation
and the Alameda County Transportation Commission**

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans.



May 2020

General Information about This Document

What's in this document:

The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), has prepared this Initial Study with Mitigated Negative Declaration/Environmental Assessment (IS/EA), which examines the potential environmental impacts of the proposed project located in Alameda County and Contra Costa County, California. Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The document tells you why the project is being proposed, what alternatives we have considered for the project, how the existing environment could be affected by the project, the potential impacts of each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

What you should do:

- Please read this IS/EA.
- This IS/EA may be downloaded at the following website: <https://dot.ca.gov/caltrans-near-me/district-4/d4-popular-links/d4-environmental-docs>. Copies of this IS/EA and related technical studies are available upon request to Brian Gassner, 510-286-6025 (voice), or e-mail to ALA680expresslanes@dot.ca.gov.
- Visit the project web page at www.alamedactc.org/680gapclosure to view a presentation and informational exhibits about the project and the IS/EA. A virtual open house will be held for the protection of public health, in accordance with State of California Executive Order N-25-20 (March 12, 2020) and subsequent State and local orders limiting in-person gatherings due to the COVID-19 pandemic. The virtual open house will be held on Thursday, June 18, 2020, at 6 PM. The open house will begin with a presentation providing an overview of the project and the environmental process, followed by a question and answer session. Attendees can submit questions via an online chat function. Please see www.alamedactc.org/680gapclosure or call Stephanie Sandoval at 510-459-6406 for more information.
- We'd like to hear what you think about the IS/EA. Please send your written comments to Caltrans by the deadline.
 - Send comments via postal mail to:
Department of Transportation, District 4 Attn: Brian Gassner,
P.O. Box 23660 MS 8B, Oakland, CA 94623-0660
 - Send comments via email to: ALA680expresslanes@dot.ca.gov.
- Be sure to send comments by the deadline: June 30, 2020.

What happens next:

After comments are received from the public and reviewing agencies, the Caltrans, as assigned by the FHWA, may: (1) give environmental approval to the proposed project, (2) perform additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is obtained, Caltrans could design and construct all or part of the project.

Alternative Formats:

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Brian Gassner, P.O. Box 23660 MS 8B, Oakland, CA, 94623-0660, 510-286-6025 (voice), e-mail ALA680expresslanes@dot.ca.gov, or use California Relay Service 1 (800) 735-2929 (TTY to Voice), 1 (800) 735-2922 (Voice to TTY), 1 (800) 855-3000 (Spanish TTY to Voice and Voice to TTY), 1-800-854-7784 (Spanish and English Speech-to-Speech) or 711.

Modify I-680 from SR 84 to Alcosta Boulevard in the Counties of Alameda and Contra Costa, California
(Post Miles R10.6 to R21.9 in Alameda County and R0.0 to R1.1 in Contra Costa County)

Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C), 49 USC 303, and/or 23 USC 138

THE STATE OF CALIFORNIA
Department of Transportation

Cooperating Agencies: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, Federal Highway
Administration, California Department of Fish and Wildlife, San Francisco Bay Regional Water Quality Control
Board

Responsible Agencies: Alameda County Transportation Commission, California Transportation Commission

May 20, 2020

Date



Christopher Caputo
Office Chief, Acting
Office of Environmental Analysis
California Department of Transportation

The following persons may be contacted for more information about this document:

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P.O. Box 23660, MS 8B
Oakland, CA 94623-0660
510-286-6025

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Proposed Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans), in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes to construct High Occupancy Vehicle/express lanes (HOV/express lanes) on northbound and southbound Interstate 680 (I-680) from State Route (SR) 84 (Vallecitos Road) in Alameda County to north of Alcosta Boulevard in Contra Costa County. HOV/express lanes are specially designated freeway lanes that are free for eligible HOVs and also give other vehicles, including single-occupant vehicles (SOVs), the option to pay a toll to use the lane.

The proposed project extends for approximately 9 miles along I-680 from post mile (PM) R10.6 to R21.9 in Alameda County and from PM R0.0 to R1.1 in Contra Costa County. The new HOV/express lanes would pass in or near the cities of Pleasanton, Dublin, and San Ramon, and the community of Sunol.

Determination

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

Caltrans has prepared an Initial Study (IS) for this project, and pending public review, expects to determine from this study that the proposed project would not have a significant effect on the environment for the following reasons.

The proposed project would have no effect on agriculture and forestry resources, land use and planning, mineral resources, population and housing, recreation, and tribal cultural resources.

In addition, the proposed project would have less than significant effects to aesthetics, air quality, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, transportation, public services, noise, utilities and service systems, and wildfire.

With avoidance, minimization, and mitigation measures, the proposed project would have less-than-significant effects to biological resources, specifically sensitive natural communities, trees, wetlands and other waters of the U.S., and threatened and endangered species (California tiger salamander, California red-legged frog, and Alameda whipsnake).

Melanie Brent
Deputy District Director
Environmental Planning and Engineering
California Department of Transportation, District 4

Date of Approval

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Summary

The California Department of Transportation (Caltrans), in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes to construct High Occupancy Vehicle/express lanes (HOV/express lanes) on northbound and southbound Interstate 680 (I-680) from State Route (SR) 84 (Vallecitos Road) in Alameda County to north of Alcosta Boulevard in Contra Costa County. HOV/express lanes are specially designated freeway lanes that are free for eligible HOVs and also give other vehicles, including single-occupant vehicles (SOVs), the option to pay a toll to use the lane.

The proposed project would extend for approximately 9 miles along I-680 from post mile (PM) R10.6 to R21.9 in Alameda County and from PM R0.0 to R1.1 in Contra Costa County. The new HOV/express lanes would pass in or near the cities of Pleasanton, Dublin, and San Ramon, and the community of Sunol.

Caltrans, as assigned by the Federal Highway Administration (FHWA), is the lead agency under the National Environmental Policy Act (NEPA). Caltrans is also the lead agency under the California Environmental Quality Act (CEQA).

The purpose of the project is to increase the efficiency of the transportation system within the project limits; improve travel time and reliability; optimize freeway system management and traffic operations; and contribute to the completion of HOV/express lanes between Santa Clara County and Contra Costa County.

The project is needed because high transportation demand leads to congestion and reduced vehicle speeds on I-680 in the project area for approximately 10 hours each weekday. Future travel demand on I-680 will continue to exceed the available capacity during peak periods, adversely affecting travel speeds and increasing the level and duration of congestion. The systems used to manage the HOV/express lanes and optimize freeway operations would improve travel time reliability and relieve traffic congestion that contributes to accidents. In addition, the project would optimize the effectiveness of the existing and in-construction HOV/express lane segments to the south and north.

NEPA Assignment

California participated in the “Surface Transportation Project Delivery Pilot Program” (Pilot Program) pursuant to 23 USC 327, for more than five years, beginning July 1, 2007, and ending September 30, 2012. The Moving Ahead for Progress in the 21st Century Act (MAP-21; P.L. 112-141), signed by President Obama on July 6, 2012, amended 23 USC 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, Caltrans entered into a Memorandum of Understanding pursuant to 23 USC 327 (NEPA Assignment MOU) with FHWA. The NEPA Assignment MOU became effective October 1, 2012, and was renewed on December 23, 2016, for a term of five years. In summary, Caltrans continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With NEPA Assignment, FHWA assigned and Caltrans assumed all of the United States Department of Transportation (USDOT) Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off of the State Highway System within the

State of California, except for certain categorical exclusions that FHWA assigned to Caltrans under the 23 USC 326 CE Assignment MOU, projects excluded by definition, and specific project exclusions.

Project Impacts

Table S-1 summarizes the effects of the Build Alternative in comparison with the No Build Alternative. The proposed avoidance, minimization, and/or mitigation measures to reduce the effects of the Build Alternative are also presented. This environmental document evaluates the potential effects of the Build Alternative. A complete description of potential effects and recommended measures is provided in Chapter 2.

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

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Existing and Future Land Use	None.	None.	None.
Consistency with State, Regional and Local Plans and Programs	The No Build Alternative would be inconsistent with <i>Plan Bay Area 2040</i> because it would not contribute to the Regional Express Lanes Network. It would also be inconsistent with the 2014 Alameda County Transportation Expenditure Plan, San Ramon General Plan, and Pleasanton General Plan because it would not reduce traffic congestion.	The Build Alternative would be consistent with most applicable plans and policies. It would be somewhat consistent with the San Ramon General Plan because, although it would support a reduction in traffic congestion, it would not reduce vehicle miles traveled. The Build Alternative would also be somewhat consistent with the State Scenic Highway Program and Landscaped Freeway Program because it would remove vegetation along the freeway and add retaining walls and overhead signage.	VIS-1, VIS-2, VIS-3, VIS-4 (see Visual/Aesthetics below) BIO-4 (see Natural Communities below)
Parks and Recreation Facilities	None.	The Build Alternative would not acquire land from any publicly owned park or recreational facility. Construction activities would not require temporary construction easements from, or the closure, alteration, or other use of, any park facility. Recreationists on the Centennial Trail could be exposed to short-term, temporary noise and views of project construction, but construction is not expected to affect trail use.	None.
Growth	None.	The Build Alternative would increase the capacity of I-680 in the project area but would not change overall land use or provide access to previously undeveloped land. It would accommodate planned growth but would not affect land use decisions in a way that would encourage growth beyond reasonably foreseeable levels.	None.

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Environmental Justice	None.	<p>The Build Alternative would include work in two block groups that meet the criteria of an environmental justice community of concern. Project construction would not disproportionately affect these communities.</p> <p>Use of the HOV/express lanes is optional, and the project would maintain the existing number of general-purpose lanes. Express lane tolls would not cause a disproportionately high and adverse effect on environmental justice communities of concern.</p>	None.
Utilities/Emergency Services	None.	<p>The Build Alternative would require relocation of overhead electrical lines, underground gas and electrical lines, fiber optic conduit, and cable lines, which may result in short-term, temporary interruptions of service. It would not result in long-term effects on utilities or emergency services.</p>	None.
Traffic and Transportation	<p>With the No Build Alternative, long segments of the project area would operate at level of service (LOS) F during the AM and PM peak periods in 2025 and 2045, particularly in the southbound direction.</p> <p>In 2025 and 2045, the No Build Alternative would result in longer peak period vehicle hours of delay, slightly longer travel times, lower travel speeds, and longer individual delays than the Build Alternative.</p>	<p>The majority of I-680 in the project area would operate at LOS E or better during the AM and PM peak periods in 2025 and 2045. Considerably fewer areas would operate at LOS F than with the No Build Alternative. In 2025 and 2045, the Build Alternative would reduce vehicle hours of delay, travel times, travel speeds, and individual delays compared to No Build.</p> <p>Vehicle miles traveled would be 1 percent higher in 2025 and 3-5 percent higher in 2045 than with No Build, as the Build Alternative would reduce diversion to parallel arterials and the SR 84 corridor.</p> <p>Construction-related closures and detours could result in temporary, short-term disruption to motorists.</p>	None.

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Visual/ Aesthetics	None.	The Build Alternative would result in visual impacts ranging from moderate to moderate-high for highway users and highway neighbors due to new overhead signs and lighting, vegetation removal, the reconstruction of sound walls, and the addition of retaining walls.	<p>BIO-4 (see Natural Communities below)</p> <p>VIS-1. Minimize the removal of groundcover, shrubs and mature trees to the maximum extent possible, utilizing open areas for contractor staging/storage areas. Protect existing vegetation outside the clearing and grubbing limits from the contractor's operations, equipment and materials storage. Place high visibility temporary fencing around vegetation to be protected before roadway work begins. Provide truck watering of vegetation when automated irrigation is interrupted by construction.</p> <p>VIS-2. Replace removed shrubs and trees at a minimum 1:1 replacement ratio. Fund required planting through the parent roadway contract to be completed as a separate contract within 2 years of roadway completion. Plant vines along sound walls where feasible.</p> <p>VIS-3. All disturbed areas shall receive hydroseeded treatment of erosion control grasses, and if appropriate, locally native grasses.</p> <p>VIS-4. The design and color treatment for the new project features shall be similar to the existing adjacent structures and poles, so to be visually compatible and consistent with the existing installations along the corridor.</p> <p><i>See Section 2.1.8.4 for additional measures.</i></p>

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Cultural Resources	None.	One previously recorded resource has been identified in the APE. This area will be designated as an Environmentally Sensitive Area (ESA) and excluded from project activities.	<p>CUL-1. 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.</p> <p>CUL-2. If human remains are discovered, California Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, the Caltrans Branch Chief of Archaeology shall be notified, and then the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to California Public Resources Code (PRC) Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the Branch Chief of Cultural Resources, Archaeology 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.</p> <p>CUL-3. To ensure avoidance of the previously determined eligible site, the site will be designated as an ESA for the duration of the project in accordance with the requirements set forth in the Environmentally Sensitive Area Action Plan. The requirements include delineating the ESA on all project plans, conducting a preconstruction meeting with construction personnel to ensure that the ESA is properly understood, and coordinating/monitoring ESA installation by the contractor. In addition, an archaeologist will conduct field reviews of the ESA to ensure that it remains intact and is not compromised.</p>
Hydrology and Floodplain	None.	The Build Alternative would add less than 5 acres of impervious area to floodplains within the project limits, and no longitudinal encroachment would occur.	None.

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Water Quality and Storm Water Runoff	None.	The Build Alternative would result in 46.34 acres of new and reworked impervious area with the potential to increase pollutant concentrations; increase velocity, volume, and temperature of downstream flows; result in hydromodification; and reduce groundwater recharge.	<p>WQ-1. Implement temporary erosion control and water quality measures as required by the Construction General Permit.</p> <p>WQ-2. During the PS&E phase, the PDT will consider biofiltration swales/strips, detention devices, and gross solid removal devices to promote infiltration and dispersion of runoff.</p> <p>WQ-3. During the PS&E phase, design drainage that includes the use of culvert end devices such as flared end sections, tees, and rock slope protection to dissipate and disperse the energy of runoff as it flows out of the culverts onto open land, existing ditches, or treatment BMPs.</p> <p>WQ-4. During the PS&E phase, design hydromodification management measures sized per the Alameda Countywide Clean Water Program's C.3 Technical Guidance (2016).</p>
Paleontology	None.	Construction of the Build Alternative would encounter geologic units that are known to contain paleontological resources.	<p>PAL-1. Implementation of the following measures would avoid potential impacts to sensitive paleontological resources, if present. Update and finalize the Paleontological Mitigation Plan once project design is nearly complete. The final plan will be implemented during construction.</p> <p>Include a specification in the construction contract stating that paleontological monitoring will occur in accordance with the Paleontological Mitigation Plan.</p>
Hazardous Waste/Materials	None.	Construction and maintenance of the Build Alternative would involve the routine transport, use, and disposal of hazardous materials (e.g., fuels, paints, and lubricants), and could result in the potential disturbance of hazardous materials in soil, groundwater, and building materials. Lead and pesticide contamination in soil, undocumented contamination from rail and pipeline operations, contaminated groundwater, and hazardous building materials containing lead, asbestos, and hydrocarbons and metals could be encountered during construction.	<p>HAZ-1. During the final project design phase, a Preliminary Site Investigation (PSI) will be performed in accordance with current Caltrans guidance to investigate hazardous materials concerns related to soil, groundwater, and building materials within the project limits and include required measures for managing hazardous materials encountered during project construction to protect human health and the environment. These measures shall be incorporated in the final project design.</p>
Air Quality	None.	Construction of the Build Alternative would generate emissions of criteria air pollutants and precursors that could potentially affect air quality.	None.

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Noise and Vibration	Projected noise levels for the 2045 design year are expected to increase 0 to 1 dBA compared to the existing condition. Several locations would approach or exceed the Noise Abatement Criteria (NAC).	<p>The Build Alternative is anticipated to increase future (2045) noise levels by 0 to 3 dBA over existing conditions and by 0 to 2 dBA over No Build. Projected noise levels for the 2045 design year are expected to approach or exceed the NAC at several locations. Abatement measures were evaluated because a traffic noise impact would occur. Caltrans intends to incorporate noise abatement in the form of Barriers 11, 13–Relocated, and 14A–Relocated.</p> <p>Construction noise for all receptors would be short-term and intermittent, except in the area between Amador Valley Boulevard and Alcosta Boulevard, where this Alternative would remove and reconstruct existing sound walls. Noise levels would increase by up to 6 dBA while the sound walls are absent.</p> <p>If conducted at night, pile driving would generate substantially higher hourly noise levels than existing nighttime levels.</p> <p>In addition, construction has the potential to temporarily increase noise levels at Dublin Elementary School.</p> <p>Vibratory roller use could affect vibration-sensitive equipment at nearby technology buildings in the business park on Arlington Drive.</p>	NOI-1. Standard Caltrans measures that are used for all projects include that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9:00 PM to 6:00 AM. Measures listed in Section 2.2.6.4 will also be implemented to minimize or reduce the potential for noise impacts from project construction.

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Natural Communities	None.	<p>The Build Alternative would result in temporary or permanent impacts to grasslands, forest and woodland, scrubland, wetland, and riverine communities.</p> <p>The project would have direct and indirect permanent impacts to trees through the removal of woodland habitat due to ground disturbance during construction or heavy pruning.</p> <p>The Build Alternative would not affect wildlife movement between the west and east sides of I-680.</p> <p>No impacts to fish passage would occur.</p>	<p>BIO-1. Several measures, which are detailed in Section 2.3.1.3, would be implemented as part of construction to minimize and/or avoid impacts to sensitive vegetation communities, species, and habitat as well as to common biological resources.</p> <p>BIO-2. Compensatory mitigation for temporary impacts to vegetation communities or Natural Communities of Concern under CEQA, including valley oak woodland, will be provided through the restoration of habitat by planting native species that are typical to that habitat. If enough space is not available for on-site mitigation, off-site like-habitat providing these species habitat requirements will be preserved through the purchase of mitigation bank credits.</p> <p>BIO-3. Post-construction measures will include revegetation of temporarily impacted areas by the planting of trees where appropriate, selecting sites based on existing topography, hydrology, and surrounding habitat. Additional details are provided in Section 2.3.1.3.</p> <p>BIO-4. Tree replanting and mitigation ratios will be determined in consultation with CDFW. The need for some off-site tree planting may be required. Replanted areas will be monitored for success for up to 10 years. Additional details are provided in Section 2.3.1.3.</p> <p>BIO-5. Culverts in serviceable condition would be extended to address the proposed widening and to maintain existing drainage patterns, while undersized culverts would be replaced with larger sizes (i.e., any culvert under 16 inches in diameter will be enlarged to at least 16 inches, and to over 24 inches where space allows). This will maintain connectivity from the east and west sides of I-680.</p>

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Wetlands and Other Waters of the United States	None.	<p>The Build Alternative has the potential to temporarily impact less than 0.01 acre of potentially jurisdictional other waters of the United States.</p> <p>The project has the potential to permanently impact 0.04 acre and temporarily impact 0.09 acre of potentially jurisdictional culverted waters of the United States as a result of culvert upgrades and repairs.</p> <p>Project activities have the potential to result in a total of 215 linear feet of permanent and 6,272 linear feet of temporary impacts to nonjurisdictional stormwater features.</p>	<p>BIO-6. Standard Caltrans measures that are used for all projects include that a storm water pollution prevention plan (SWPPP) and erosion control BMPs will be developed and implemented to minimize any wind or water-related material discharges, in compliance with the requirements of the Regional Water Quality Control Board (RWQCB) as well as the 2018 Caltrans Standard Specifications, Section 13. The SWPPP must also comply with the goals and restrictions identified in the RWQCB's Basin Plan. Any additional measures included in the Water Quality Certification will be implemented. The contractor will also comply with the standards/objectives noted in Section 2.3.2.4.</p> <p>BIO-7. Under Federal and State guidance and rules, adverse, unavoidable impacts to wetlands and other aquatic resources require compensatory mitigation to offset the loss of the functions and values of the feature. Temporary impacts will be mitigated at a minimum 1:1 ratio. A 3:1 ratio is standard for permanent impacts to wetlands and other aquatic resources based on a project's risk of failure to compensate for impacts to wetlands (mitigation project), and the temporal loss, or reduction of functions, during the time it takes a mitigation project to achieve the targeted level of performance for all of its functions. Impacted culverts will be replaced in kind on site. No other mitigation is required.</p>
Plant Species	None.	<p>Congdon's tarplant, stinkbells, Diablo helianthella, and bristly leptosiphon have a low potential to occur. The project would have permanent impacts to 0.13 acre of California annual grassland, 7.01 acres of ruderal grassland, and 0.45 acre of woodland that could provide potential habitat for the species, if present.</p>	<p>BIO-1 and BIO-6 (see above)</p> <p>BIO-8. Before the commencement of construction activities, a qualified biologist shall conduct appropriately timed surveys for the listed plant species. To correspond with these species' blooming periods, the surveys shall include botanical inventories between March and June (to coincide with the blooming period of stinkbells, Diablo helianthella, and bristly leptosiphon) and May through October (the blooming period of Congdon's tarplant). If listed plant species are discovered within the construction area, protective measures will be established as described in Section 2.3.3.4.</p>

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Animal Species	None.	<p>The Build Alternative has the potential to affect habitat for western pond turtle, western burrowing owl, San Francisco dusky-footed woodrat, American badger, nesting raptors, migratory birds, and special-status and “high priority” bats through the disturbance of nests, foraging habitat, or roosting sites.</p> <p>Nighttime work is expected to temporarily impact diurnal wildlife activities.</p>	<p>BIO-1 and BIO-6 (see above)</p> <p><i>Western Pond Turtles:</i> BIO-9. Before any construction activities begin, an approved biologist(s) shall conduct a training session for all construction personnel. In addition, an approved biologist(s) shall survey the work site no more than 48 hours before the onset of activities for signs of western pond turtles and/or western pond turtle nesting activity or nest depredation. Section 2.3.4.4 provides additional details.</p> <p><i>Nesting Raptors and Migratory Birds:</i> BIO-1 (see above) and Migratory Bird Special Contract Provisions will be adhered to.</p> <p>BIO-10. Preconstruction surveys for raptors will be conducted within 500 feet of the construction area, and surveys for other special-status birds and appropriate nesting habitat will be conducted within 50 feet of the construction area, no more than three days prior to ground disturbing activities. Section 2.3.4.4 provides additional details.</p> <p><i>Western Burrowing Owl:</i> BIO-1 (see above) and Migratory Bird Special Contract Provisions will be adhered to.</p> <p>BIO-11. Appropriate avoidance, minimization, or protection measures shall be determined in consultation with the CDFW in the event an active burrow is located in an area subject to disturbance, or within the typical setback (i.e., occupied burrows or nests within 150 feet of an area subject to disturbance during the nonbreeding season, or within 250 feet of an area subject to disturbance during the breeding season).</p> <p><i>San Francisco Dusky-Footed Woodrat:</i> BIO-12. Focused species surveys will be conducted to determine the presence of San Francisco Dusky-Footed Woodrat in the project area, prior to the start of construction. A woodrat trapping and relocation plan will be developed and implemented prior to project construction. Specific methods for trapping are described in Section 2.3.4.4.</p>

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
			<p><i>American Badger: BIO-13.</i> Preconstruction surveys will be conducted within the project footprint in areas of suitable habitat to identify dens or signs of American badger. If an American badger is detected on site at any time during these surveys, CDFW will be contacted to discuss ways to proceed with the project and to avoid take to the maximum extent practicable.</p> <p><i>Special-Status and "High Priority" Bats: BIO-14.</i> Focused preconstruction surveys will be conducted for all areas that provide suitable bat roosting habitat. Sensitive habitat areas and roost sites will be avoided to the maximum extent practicable as described in Section 2.3.4.4.</p> <p><i>General Measure: BIO-15.</i> Potential light, glare, and construction noise and vibration impacts on wildlife will be addressed through use of lighting in areas only where necessary for safety and signage; downcast lighting to minimize illumination of natural areas, particularly in riparian areas and adjacent to drainages; and limiting operation of vibration-causing equipment to daylight hours when working in areas adjacent to open space. A biological monitor shall be present to observe activities of wildlife during nighttime construction adjacent to open spaces.</p>

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Threatened and Endangered Species	None.	The Build Alternative may affect and is likely to adversely affect California tiger salamander, California red-legged frog, and Alameda whipsnake.	<p>BIO-1 and BIO-6 (see above)</p> <p><i>California Tiger Salamander: BIO-16.</i> Work will occur during the dry season, where feasible. Pre-construction surveys will occur near suitable habitat. An approved biologist will clear the site of California tiger salamander 24 hours prior to ground-disturbing activities, and will be present during construction activities. Excavated trenches more than 1 foot deep with walls steeper than 30 degrees shall be covered or have an escape ramp and trenches will be inspected prior to filling. An erosion and sediment control plan will be implemented. If individuals are observed, the steps outlined in Section 2.3.5.4 will be followed.</p> <p>BIO-17. On-site mitigation will include restoration of all temporarily impacted areas. Off-site mitigation under the California Endangered Species Act (CESA) will include purchase of habitat credits at a 3:1 ratio from an approved mitigation bank.</p> <p><i>California Red-Legged Frog: BIO-18.</i> Pre-Construction surveys will occur near suitable refuge habitats. Potentially occupied refugia will be fenced and avoided for the duration of activity at that location.</p> <p>The avoidance and minimization measures listed to avoid impacts to California tiger salamander and California red-legged frog are applicable to the Alameda whipsnake.</p>
Invasive Species	None.	Project construction activities have the potential to inadvertently spread noxious weed species.	BIO-19. The landscaping and erosion control included in the project will not use species listed as invasive. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.
Cumulative Impacts	None.	<p>The Build Alternative would contribute incrementally to cumulative visual/aesthetic impacts. The proposed measures and adherence to Caltrans standard design requirements would reduce impacts. The net impact would not be cumulatively considerable.</p> <p>Impacts to oak woodlands and threatened and endangered species would be minimal.</p> <p>No cumulative effects are anticipated for the remaining resource areas.</p>	<p><i>Visual/Aesthetic: VIS-1, VIS-2, VIS-3, VIS-4</i> (see Visual/Aesthetics); BIO-4 (see Natural Communities)</p> <p><i>Oak Woodlands: BIO-1, BIO-2, BIO-3, BIO-4</i> (see Natural Communities)</p> <p><i>Threatened and Endangered Species: BIO-1</i> (see Natural Communities), BIO-6 (see Wetlands and Other Waters of the United States), BIO-16, BIO-17, BIO-18 (see Threatened and Endangered Species)</p>

Affected Resource	Potential Impact: No Build Alternative	Potential Impact: Build Alternative	Avoidance, Minimization, and/or Mitigation Measures
Wildfire	None.	The Build Alternative would not impair implementation of an emergency response or emergency evacuation plan, exacerbate wildfire risks or expose project occupants to pollutants from a wildfire or the uncontrolled spread of a wildfire, increase wildland fire risk through installation or maintenance of associated infrastructure, or result in downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes.	WQ-1, WQ-2, WQ-3, WQ-4 (see Water Quality and Storm Water Runoff)
Climate Change	None.	<p>The daily carbon dioxide emissions estimated for the Build Alternative would be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018). The estimated daily carbon dioxide emissions for the Build Alternative during the opening year, horizon year, and design year scenarios would be slightly higher (up to 0.3 percent) than the emissions for the No Build Alternative.</p> <p>Project construction would result in a temporary increase in greenhouse gas (GHG) emissions that would be offset by the long-term improvement in operational greenhouse gas emissions.</p> <p>The project area is not in area subject to sea-level rise. The Build Alternative is not anticipated to exacerbate the effects of climate change in terms of precipitation depth or wildfire.</p>	The proposed HOV/express lanes would encourage and support ridesharing, carpooling, and transit use, to reduce vehicle trips and their associated GHG emissions. In addition, the project would limit GHG emissions through the use of intelligent transportation system features for traffic management, Caltrans Standard Specifications requirements for construction contractors to comply with air pollution control measures, implementation of a Transportation Management Plan during construction to minimize traffic delays, and use of energy-efficient LED lighting fixtures.

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Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans), in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes to construct High Occupancy Vehicle/express lanes (HOV/express lanes) on northbound and southbound Interstate 680 (I-680) from State Route (SR) 84 (Vallecitos Road) in Alameda County to north of Alcosta Boulevard in Contra Costa County. HOV/express lanes are specially designated freeway lanes that are free for eligible HOVs and also give other vehicles, including single-occupant vehicles (SOVs), the option to pay a toll to use the lane.

Figure 1.1-1 shows the location of the proposed project, which extends for approximately 9 miles along I-680 from post mile (PM) R10.6 to R21.9 in Alameda County and from PM R0.0 to R1.1 in Contra Costa County. The new HOV/express lanes would pass in or near the cities of Pleasanton, Dublin, and San Ramon, and the community of Sunol.

The project is included in the Metropolitan Transportation Commission's (MTC's) Bay Area Regional Transportation Plan (RTP), *Plan Bay Area 2040* (Association of Bay Area Governments [ABAG] and MTC 2017a, amended 2020; RTP ID No. 17-10-0065). The project is in the 2019 Transportation Improvement Program (TIP), which was adopted by the MTC on September 28, 2018 (MTC 2018; TIP ID No. ALA170009). The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) approved the 2019 TIP on December 17, 2018. The project is also included in the 2014 Alameda County Transportation Expenditure Plan (Alameda CTC 2014).

Caltrans, as assigned by the FHWA, is the lead agency under the National Environmental Policy Act (NEPA). Caltrans is the lead agency under the California Environmental Quality Act (CEQA).

1.2 Location and Background

I-680 extends from the I-280/United States Highway 101 interchange in San Jose in the south to the I-80/SR 12 interchange in Fairfield in the north. I-680 is a major north-south transportation corridor connecting Silicon Valley and the surrounding South Bay with the Tri-Valley area and eastern Contra Costa County. The Tri-Valley area includes Dublin, Livermore, and Pleasanton in Alameda County as well as Danville and San Ramon in Contra Costa County.

In the project area, I-680 contains three general-purpose lanes in each direction, except north of Dublin Boulevard, which has four general-purpose lanes in the northbound direction. General-purpose lanes have no vehicle type or occupancy restrictions. HOV/express lanes exist or are under construction on I-680 to the north and south of the proposed project area. The posted speed limit is 65 miles per hour (mph).

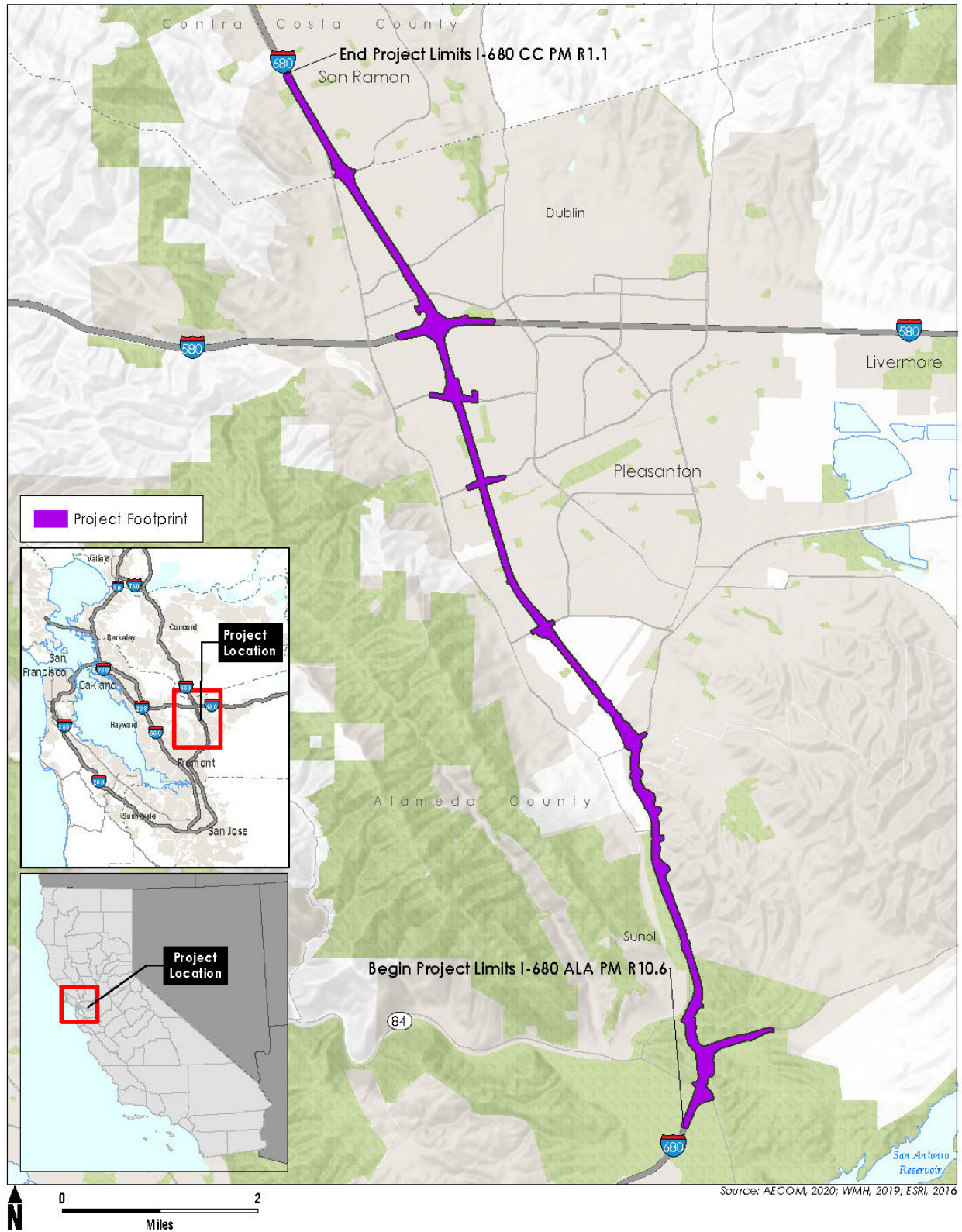


Figure 1.1-1: Project Location

1.3 Purpose and Need

1.3.1 Project Purpose

The purposes of the project are to:

- Increase the efficiency of the transportation system on I-680 between the I-680/SR 84 interchange and north of the I-680/Alcosta Boulevard interchange to accommodate current and future traffic demand;
- Improve travel time and reliability for all users, including HOV and transit users;
- Optimize freeway system management and traffic operations; and
- Contribute to the completion of 48 miles of contiguous HOV/express lanes between Santa Clara County and Contra Costa County.

1.3.2 Project Need

The following describes the existing traffic operations on I-680 in the project area and projected future traffic growth.

1.3.2.1 Capacity and Transportation Demand

Existing Congestion

Highway capacity is a metric used to assess congestion. The capacity of a general-purpose lane is typically considered to be 2,000 vehicles per hour (vph). The capacity of an HOV lane is typically considered to be 1,650 vph, which is the threshold of operation needed to provide HOVs with reliable travel time savings.¹ Comparing the counted or forecasted volume (known as traffic demand) of a highway to the approximate per-lane capacity indicates where and when congestion occurs.

In many segments of the project corridor, high traffic demand exceeds the available capacity, resulting in traffic congestion for approximately 10 hours each weekday. The primary travel directions on I-680 are southbound in the morning and northbound in the afternoon.

During the AM peak hour (from 7 AM to 8 AM), traffic demand on southbound I-680 generally approaches or exceeds capacity. A bottleneck between the Sunol Boulevard on-ramp and Koopman Road off-ramp slows vehicle speeds to between 15 and 35 mph northward to the westbound I-580 off-ramp. In addition, volumes along the corridor are near capacity from Sunol Boulevard to the SR 84 interchange (Fehr & Peers 2018). During the AM peak period (5 AM to 1 PM), drivers on southbound I-680 experience up to 17 minutes of delay traveling through the traffic study corridor. The study corridor includes southbound I-680 between the Bollinger Canyon Road interchange in San Ramon and the Sheridan Road interchange in unincorporated Alameda County, and northbound I-680 between the Washington Boulevard interchange in Fremont and the Bollinger Canyon Road interchange in San Ramon, as

¹ Title 23, Section 166(d)(2) of the United States Code (USC) set a minimum average operating speed of 45 mph for HOV lanes with a speed limit of 50 mph or higher, which generally corresponds to a target threshold of approximately 1,650 vph per HOV lane.

discussed further in Section 2.1.7.1. The average travel speed through the study corridor on southbound I-680 is 52 mph.

During the PM peak hour (from 5 PM to 6 PM), traffic demand on northbound I-680 exceeds capacity to the south of the SR 84 interchange. A bottleneck between the Andrade Road on-ramp and the Calaveras Road (SR 84) off-ramp slows traffic to between 8 and 35 mph southward to the Mission Boulevard (SR 262) interchange in Fremont, outside of the project area. North of the SR 84 interchange, volumes along segments of northbound I-680 are near capacity, and another PM peak period bottleneck exists between Stoneridge Drive and I-580 (Fehr & Peers 2018). During the PM peak period (2 PM to 9 PM), drivers on northbound I-680 in the study corridor experience approximately 11 minutes of delay, and the average travel speed is just under 47 mph.

Existing traffic conditions are discussed further in Section 2.1.7.1.

Future Congestion

Vehicle demand volumes in the project area are anticipated to grow by more than 30 percent between 2015 and 2045, with a minimum of 1 percent growth per year based on *Plan Bay Area* forecasts of jobs and households in the I-680 corridor (Fehr & Peers 2018). These projections of future conditions within the project limits indicate that the demand for travel will continue to exceed the available capacity during peak periods, adversely affecting travel speeds, and increasing the level and duration of congestion.

In future study year 2045, congestion from the existing bottleneck on southbound I-680 between Sunol Boulevard and Koopman Road would last from 5 AM to 12:30 PM, resulting in backups extending to the north of the Crow Canyon Road interchange. During the AM peak period (5 AM to 1 PM), drivers traveling through the study corridor on southbound I-680 would experience maximum delays of close to 47 minutes, and the average travel speed would be approximately 30 mph.

In 2045, bottlenecks are anticipated to form in multiple locations along northbound I-680 during both the AM (5 AM to 1 PM) and PM (2 PM to 9 PM) peak periods. Drivers traveling through the study corridor would experience maximum delays of close to 1 hour and 13 minutes in the AM peak period and 47 minutes in the PM peak period. The average travel speed would be approximately 42 mph in the AM peak period and 34 mph in the PM peak period.

Future traffic conditions are discussed further in Section 2.1.7.2.

Travel Time Reliability

The delays and travel speeds described above are averages for typical peak periods and result from fixed bottlenecks that cause persistent congestion. Because the congestion is predictable, travelers can plan for it by allowing extra time, traveling at off-peak times, or using different routes. Traffic incidents and even weather such as heavy rain can have variable and unpredictable effects on travel time. Travel time reliability relates to the predictability of traffic conditions. I-680 in the project area has no restrictions on lane use, and travel time delays can be unpredictable from day to day when demand and use exceed capacity.

HOV/express lanes provide greater travel time reliability for lane users through the use of dynamic toll pricing to maintain speeds of 45 mph or greater.² Closing the 9-mile gap between the existing and in-construction HOV/express lanes to the north and south would also reduce the overall level of congestion in the system, which typically makes travel time more reliable in all lanes. In addition, the enforcement and incident management systems that are used to maintain acceptable traffic flow in the HOV/express lanes would support increased emergency response times, and the lanes would provide additional capacity to recover from unforeseen events, which would improve travel time reliability for all travelers.

1.3.2.2 Modal Interrelationships and System Linkages

Bay Area Express Lanes Network

Plan Bay Area, the 2013 RTP for the nine-county Bay Area, called for a 550-mile regional network of express lanes to be completed by 2035 (ABAG and MTC 2013). *Plan Bay Area 2040*, the 2017 RTP, includes the continued development of the express lane network to take advantage of available capacity in under-used carpool lanes and to improve traffic management and reliability on well-used carpool lanes (ABAG and MTC 2017a).

In 2014, Alameda County voters passed the Measure BB sales tax, which allocated funding for HOV/express lanes on I-680 from SR 237 to Alcosta Boulevard (Alameda CTC 2014). In September 2018, Caltrans approved a Project Study Report/Project Development Support (PSR/PDS) to request approval for the proposed project to proceed to the Project Approval and Environmental Document (PA&ED) phase. The PSR/PDS evaluated the same alternatives—one Build Alternative and one No Build Alternative—that are discussed in this document.

HOV/express lanes exist or are under construction in the following locations of I-680 in the project vicinity:

- South of the project area – An HOV/express lane exists on southbound I-680 from south of the SR 84 interchange to SR 237 in Milpitas, and an HOV/express lane is under construction on northbound I-680 from SR 262 (Mission Boulevard) to north of the SR 84 interchange (EA 4G050).
- Within the project area – The SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 29763) proposes to extend the existing HOV/express lane on southbound I-680 northward by approximately 2 miles, from south of the SR 84 interchange to 0.8 mile north of Koopman Road.
- North of the project area – HOV/express lanes exist on I-680 from north of Alcosta Boulevard to Rudgear Road in the southbound direction and Livorna Road in the northbound direction (EA 3G950/3G910). Contra Costa Transportation Authority is

² Title 23, Section 166 of the USC requires HOV and high-occupancy toll lanes to maintain a minimum average operating speed of 45 mph for 90 percent of the time over a consecutive 180-day period. If this average operating speed is not met, the public authority has several options they can use to increase operating speed performance, including increasing the occupancy requirements for HOVs, varying the toll charged to vehicles, and limiting the lane to HOVs only.

developing a project that extends the southbound HOV/express lane from Rudgear Road and Livorna Road to the Benicia-Martinez Bridge.

The proposed project would close the gap between existing and in-progress HOV/express lane projects directly to the north and south, as shown in Figure 1.3-1. Upon completion of the proposed project, I-680 would have continuous HOV/express lanes from SR 262 in Fremont to Livorna Road in Alamo in the northbound direction, and from Rudgear Road in Walnut Creek to SR 237 in Milpitas in the southbound direction. Future projects will provide for a continuous 48-mile express lane system by extending the I-680 northbound express lane southward to SR 237, and the northbound and southbound HOV/express lanes to Marina Vista Avenue in Martinez, just south of the Benicia-Martinez Bridge. In doing so, the project would contribute to the completion of the Bay Area Express Lanes network.

In addition, *Plan Bay Area 2040* provides for funding carpooling incentives, including private sector ride-matching applications that target utilization of express lane corridors.

Transit Study on I-680

The Livermore-Amador Valley Transit Authority (Wheels) and the Central Contra Costa Transit Authority (County Connection) currently operate bus routes that use the I-680 corridor. Separate from this project, Alameda CTC is conducting a transit study of the I-680 corridor to identify one or more public express bus service options along the I-680 corridor that would leverage the existing and planned HOV/express lanes. A continuous HOV/express lane system on I-680 would improve travel time and travel reliability for public transit, increasing the incentive for transit use in the corridor.

In January 2019, Alameda CTC conducted a transit operator workshop to collect input from local transit providers. The workshop was attended by representatives from Bay Area Rapid Transit, Caltrans, Contra Costa Transportation Authority, MTC, Santa Clara Valley Transportation Authority, and Livermore-Amador Valley Transit Authority. The purpose of the workshop was to consider target users of a potential express bus service; service type; route, termini, and stops; transit vehicle types; potential capital and operating funding opportunities; and implementation issues.

The input and observations from the workshop were considered in the development of a transit operations concept for the I-680 corridor that included a ridership analysis, revenue projections, and an operating plan. Findings were shared at a second transit operator workshop in October 2019. Work is ongoing to finalize findings, which will include capital and operating/maintenance cost estimates and potential funding sources. The transit operations concept would provide a basis for implementing potential future public express bus service on I-680 when funding is available.

A new public express bus service on I-680 is not considered an alternative to the proposed project because it would not address the purpose of the project. Although an additional transit route would increase person-throughput (the number of people moved per vehicle) and thereby incrementally reduce congestion on I-680, it would require HOV/express lanes to provide riders with improved travel time and travel reliability. By helping to provide a continuous HOV/express lane system, the proposed project, combined with other in-progress and proposed

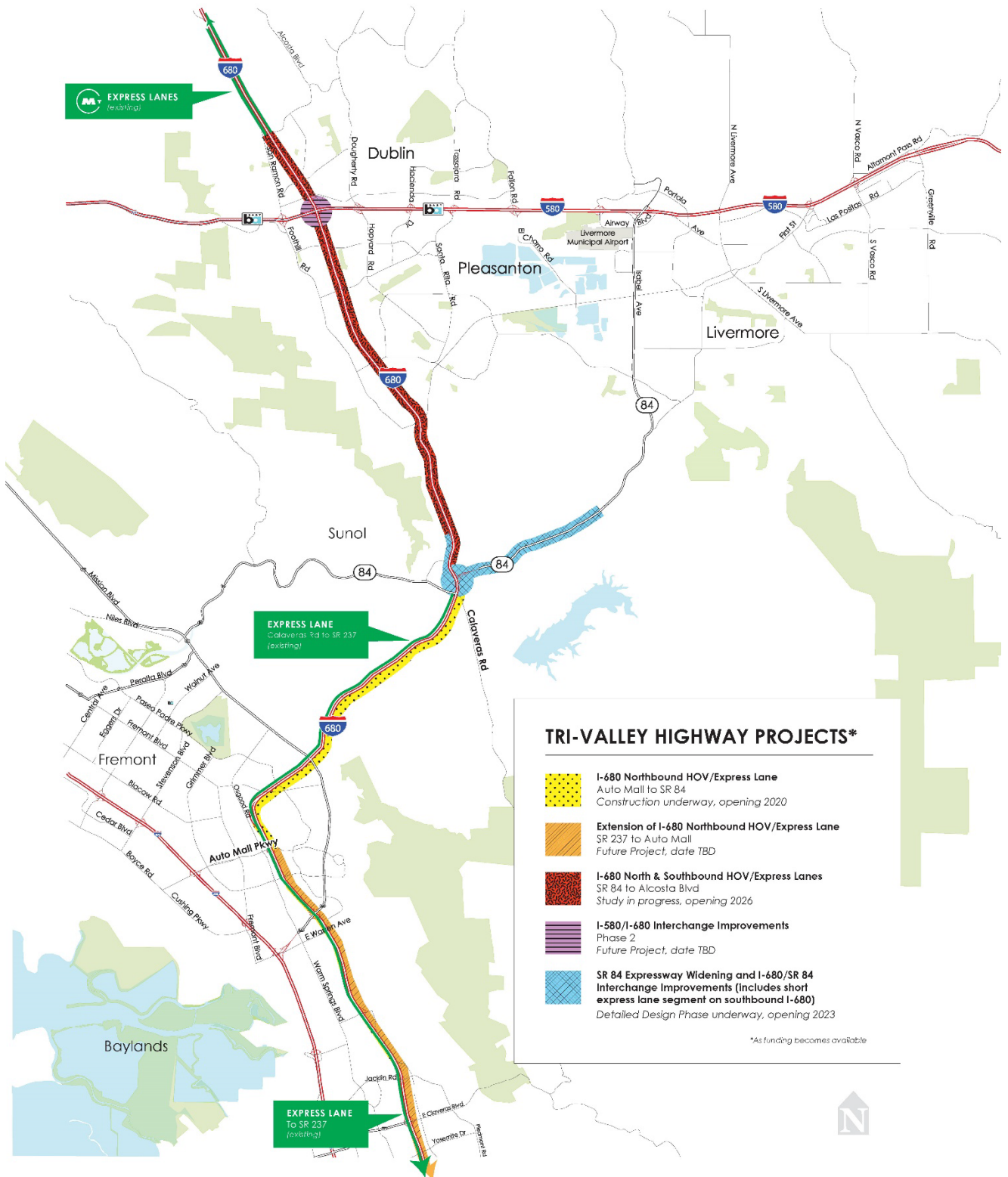


Figure 1.3-1: Proposed Project and Adjacent HOV/Express Lanes Map

HOV/express lane projects, would provide reliable travel times for public transit and help encourage transit use in the corridor.

1.3.3 Independent Utility and Logical Termini

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

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope.
2. Have independent utility or independent significance (be usable and require a reasonable expenditure even if no additional transportation improvements in the area are made).
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Logical termini are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. Independent utility, or independent significance, is defined as being a usable and reasonable expenditure even if no additional transportation improvements in the area are made.

The project limits were chosen based on the limits of the existing and in-progress HOV/express lane projects directly to the north and south, described in Section 1.3.2.2. The limits fully encompass the 9-mile gap between the HOV/express lane segments to the north and south, and therefore are rational end points for both the transportation improvement and the review of the environmental impacts.

The proposed project would not require any additional transportation improvements in the project area to meet the purpose and need. Accordingly, the proposed project is a usable and reasonable expenditure. The project would also not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

1.4 Project Description

This section describes the proposed action and the project alternatives developed to meet the purpose and need of the project, while avoiding or minimizing environmental impacts. The alternatives are the Build Alternative and the No Build Alternative.

The proposed project would construct HOV/express lanes on northbound and southbound I-680 from SR 84 in Alameda County to north of Alcosta Boulevard in Contra Costa County, a distance of approximately 9 miles.

The purpose of the project is to increase the efficiency of the transportation system within the project limits; improve travel time and reliability; optimize freeway system management and traffic operations; and contribute to the completion of HOV/express lanes between Santa Clara County and Contra Costa County.

The following sections describe the Build Alternative and the No Build Alternative.

1.4.1 Build Alternative

The Build Alternative would consist of the following primary components:

- Addition of a new HOV/express lane in both the southbound and northbound directions of I-680 from SR 84 to Alcosta Boulevard;
- Installation of electronic tolling equipment and signage;
- Widening/reconstruction of pavement in the median to accommodate the HOV/express lanes;
- Widening or modification of bridge structures to accommodate freeway widening; and
- New and replacement concrete barriers (including the median barrier), retaining walls, and sound walls.

The Build Alternative is anticipated to be constructed in two phases and represents the long-term vision for buildout of the HOV/express lane facility on I-680 from SR 84 to Alcosta Boulevard. The phases are envisioned as follows:

- Phase 1 would construct the southbound HOV/express lane and all project-related improvements in the median (both northbound and southbound). In the south, the Phase 1 HOV/express lane would connect with a future HOV/express lane to the south that will be constructed as part of another project (EA 04-29763). The future lane (EA 04-29763) will extend from south of SR 84 to 0.8 mile north of Koopman Road in Sunol and will open to traffic before Phase 1. In the north, the Phase 1 HOV/express lane would connect with the existing HOV/express lane that begins north of Alcosta Boulevard in San Ramon. On completion of Phase 1, the southbound I-680 express lane would extend from Rudgear Road in Walnut Creek to SR 237 in Milpitas.
- Phase 2 would construct the northbound HOV/express lane. In the south, the Phase 2 HOV/express lane would connect with an HOV/express lane to the south that is being constructed as part of another project (EA 04-4G050) and will open to traffic before Phase 2. In the north, the Phase 2 HOV/express lane would connect with the existing HOV/express lane that begins north of Alcosta Boulevard in San Ramon. On completion of Phase 2, the northbound I-680 express lane would extend from SR 262 in Fremont to Livorna Road in Alamo.

Depending on the availability of funding, construction of Phase 1 or the entire Build Alternative (Phase 1 plus Phase 2) could begin in Spring 2022 to early 2023.

The following sections describe the proposed project by component. The proposed project is shown in Figure 1.4-1.

1.4.1.1 HOV/Express Lanes

The HOV/express lanes would be adjacent to the median and would connect with existing HOV/express lanes south of SR 84 and in the vicinity of Alcosta Boulevard. Consistent with other HOV/express lanes that are currently being planned and implemented in the Bay Area, the Build Alternative would allow continuous access between the HOV/express lanes and the adjacent

general-purpose lanes. An 8-inch white dashed line would allow traffic to enter and exit the HOV/express lane anywhere along the project corridor.

During the hours of operation, drivers of SOVs can choose to use the HOV/express lanes for a fee. All eligible HOVs as authorized by the Federal and State statutes (including motorcycles, buses, and eligible clean air vehicles as authorized by the California Air Resources Board [CARB]) can access the HOV/express lane during the hours of operation. Depending on the operational business rules, these vehicles may travel fee-free or may incur a reduced fee. The Bay Area Managed Lanes Committee, composed of Caltrans, MTC, and California Highway Patrol (CHP) staff, will decide hours of operations of the HOV/express lanes. Outside of the hours of operation, the HOV/express lanes would be operated as general-purpose lanes, open to all users for no toll.

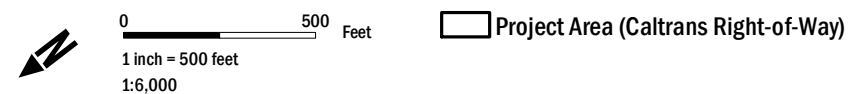
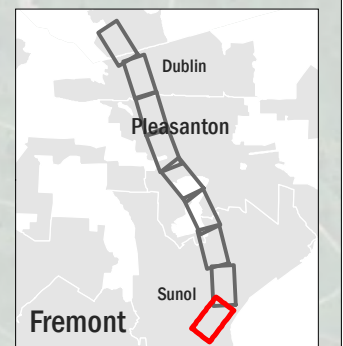
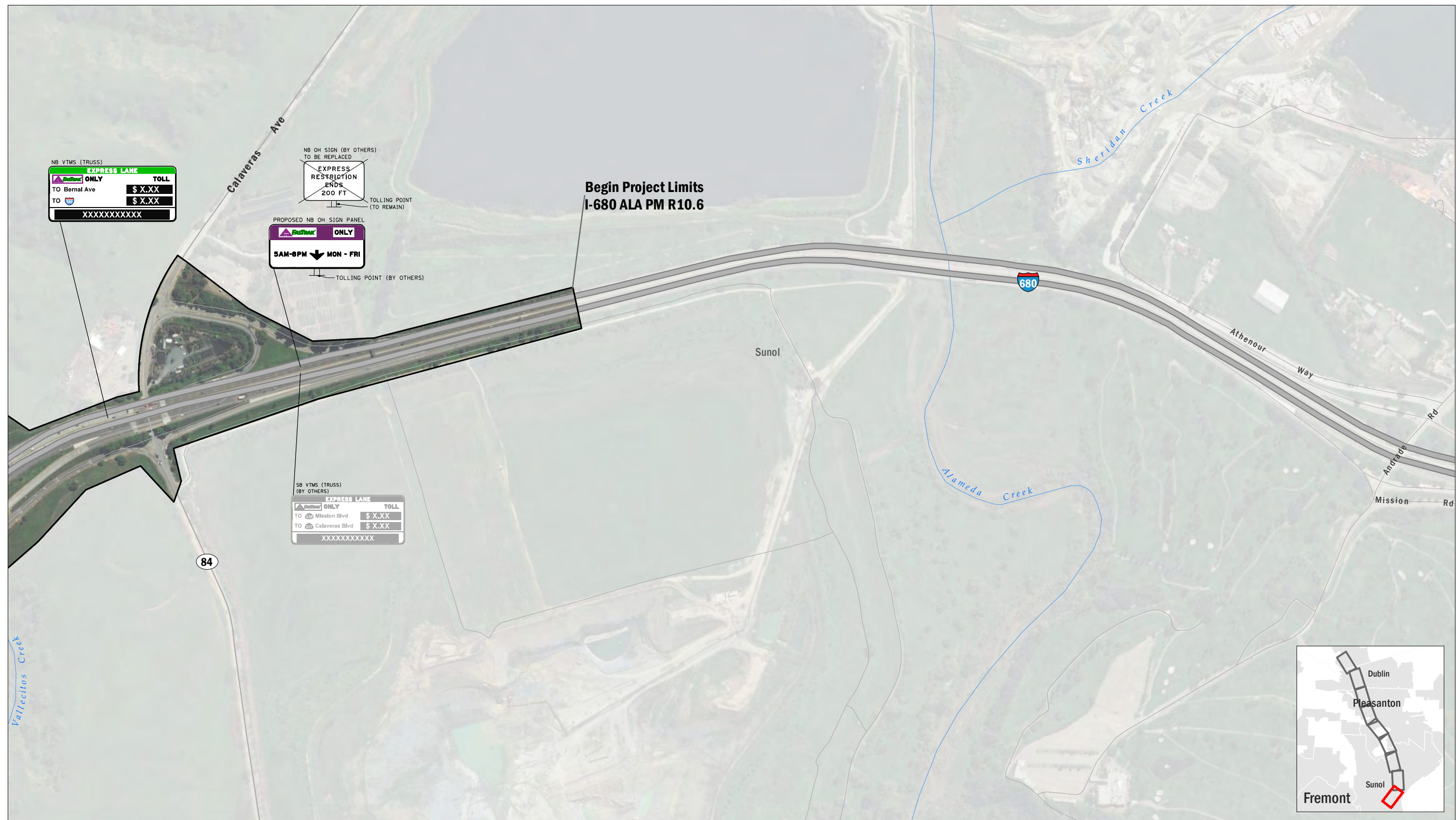
Enforcement

The proposed HOV/express lanes are expected to operate with a vehicle occupancy requirement of two or more (2+) persons per HOV, unless a different vehicle occupancy is decided by the Bay Area Managed Lanes Committee. The HOV/express lanes would also provide SOVs with the choice to pay a toll electronically to use underutilized lane capacity while HOV-eligible users would continue to use the lanes for free or for a discounted rate, depending on the business rules. The toll rate for toll-paying users would vary depending on the level of traffic congestion and distance traveled.

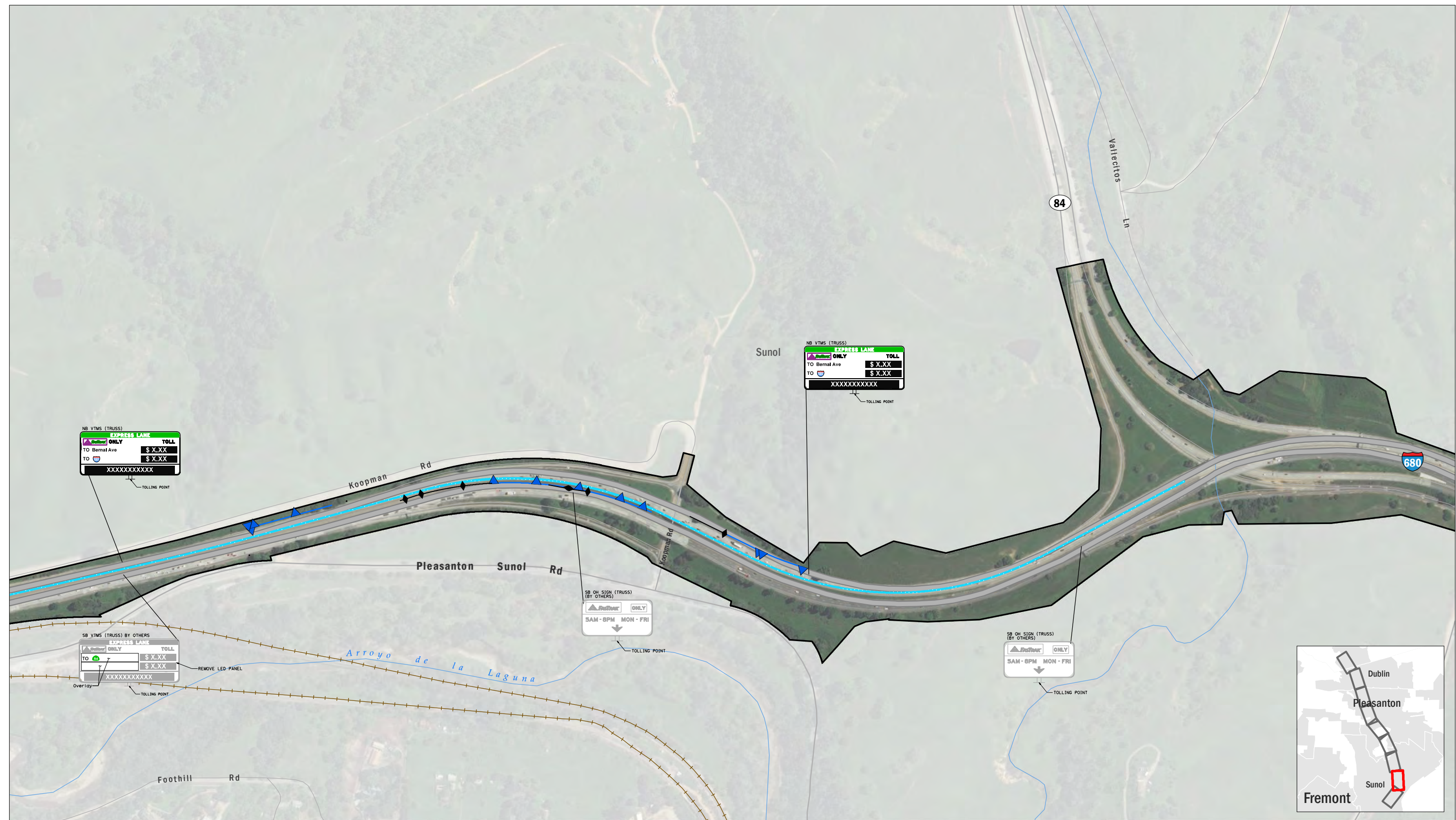
The tolling operation would be fully electronic, with no requirement to stop and make cash payments for a trip. Tolls are assessed to users based on FasTrak transponders and/or license plates. License Plate Recognition (LPR) cameras would capture vehicle license plate images and assess tolls to a valid FasTrak account or issue toll violation notices if no valid account is associated with the vehicle. Toll violation would be enforced through an automated violation process. To facilitate violation enforcement, toll gantries would be installed at relatively close spacing, estimated to be 0.5 to 0.75 mile apart.

Although the use of LPR and toll transponders would automate toll violations, the CHP is responsible for enforcing all laws that apply to the HOV/express lanes, including toll and HOV laws. Vehicles with a valid FasTrak transponder would trigger a transaction indicator beacon. CHP officers would monitor the indicator beacon and observe from a distance whether the identified vehicle is self-declaring its status as an HOV3+, HOV2, or SOV, or if the vehicle does not have a valid FasTrak transponder. If the CHP determines that a driver is self-declaring (via FasTrak transponder) a higher occupancy than is observed in the vehicle, or if the vehicle does not have a valid FasTrak transponder or a properly mounted and readable license plate, the vehicle may be pulled over and cited.

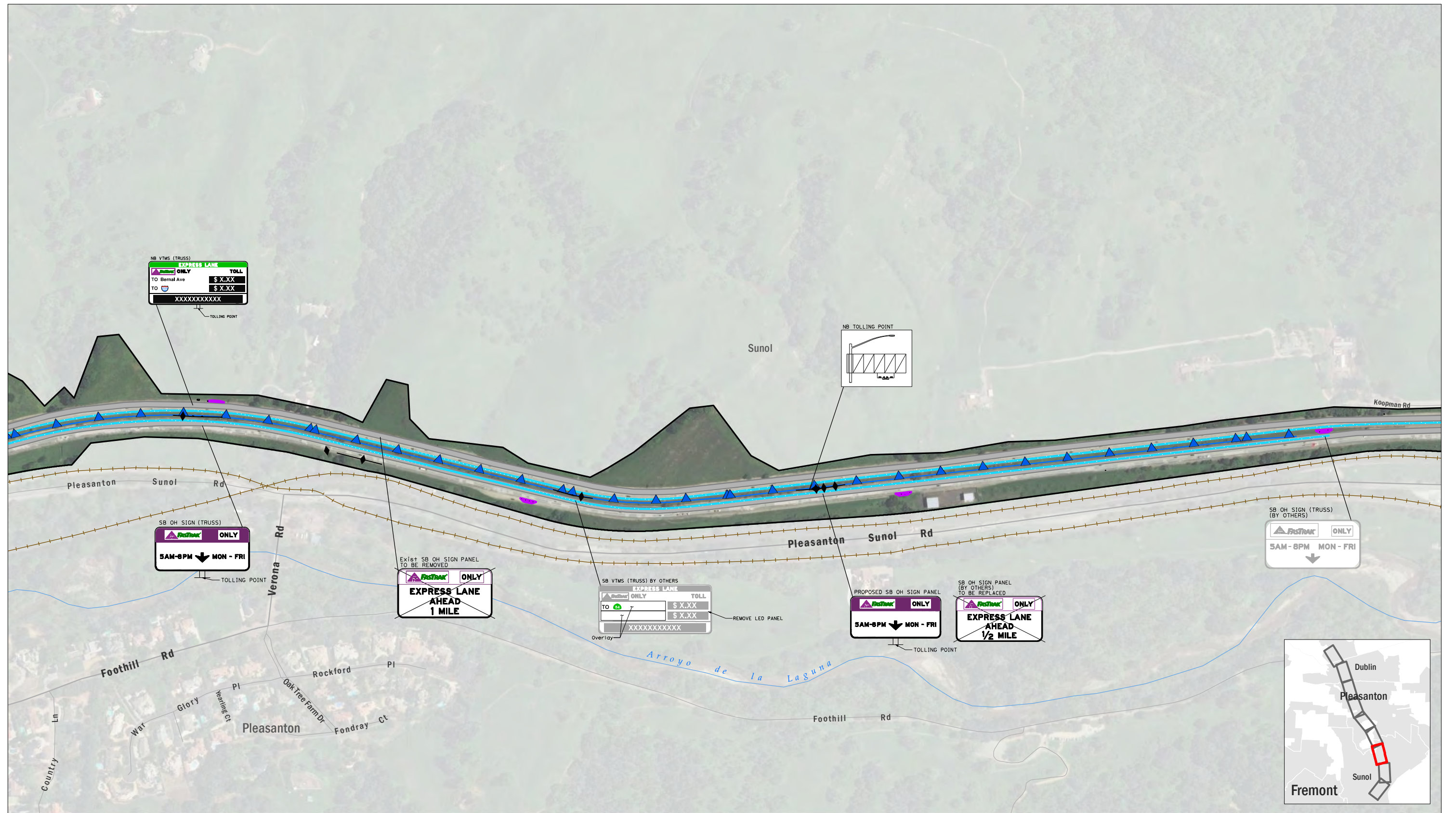
To allow CHP enforcement of the express lane, one or more protected observation areas would be provided in the freeway median. A tentative CHP enforcement location is shown in Figure 1.4-1 (Page 6 of 9) between Bernal Avenue and Las Positas Boulevard (PM R18.0); however, the final location(s) would be identified in coordination with CHP. The CHP area would be approximately 115 feet long and vary between 10 to 14 feet in width. The CHP vehicle would park behind concrete barriers on a raised platform to improve the line of sight for traffic observation. The median would provide barrier protection for the officer and vehicle, and contain status beacons or lights visible to the officer that indicate valid or invalid tolling.

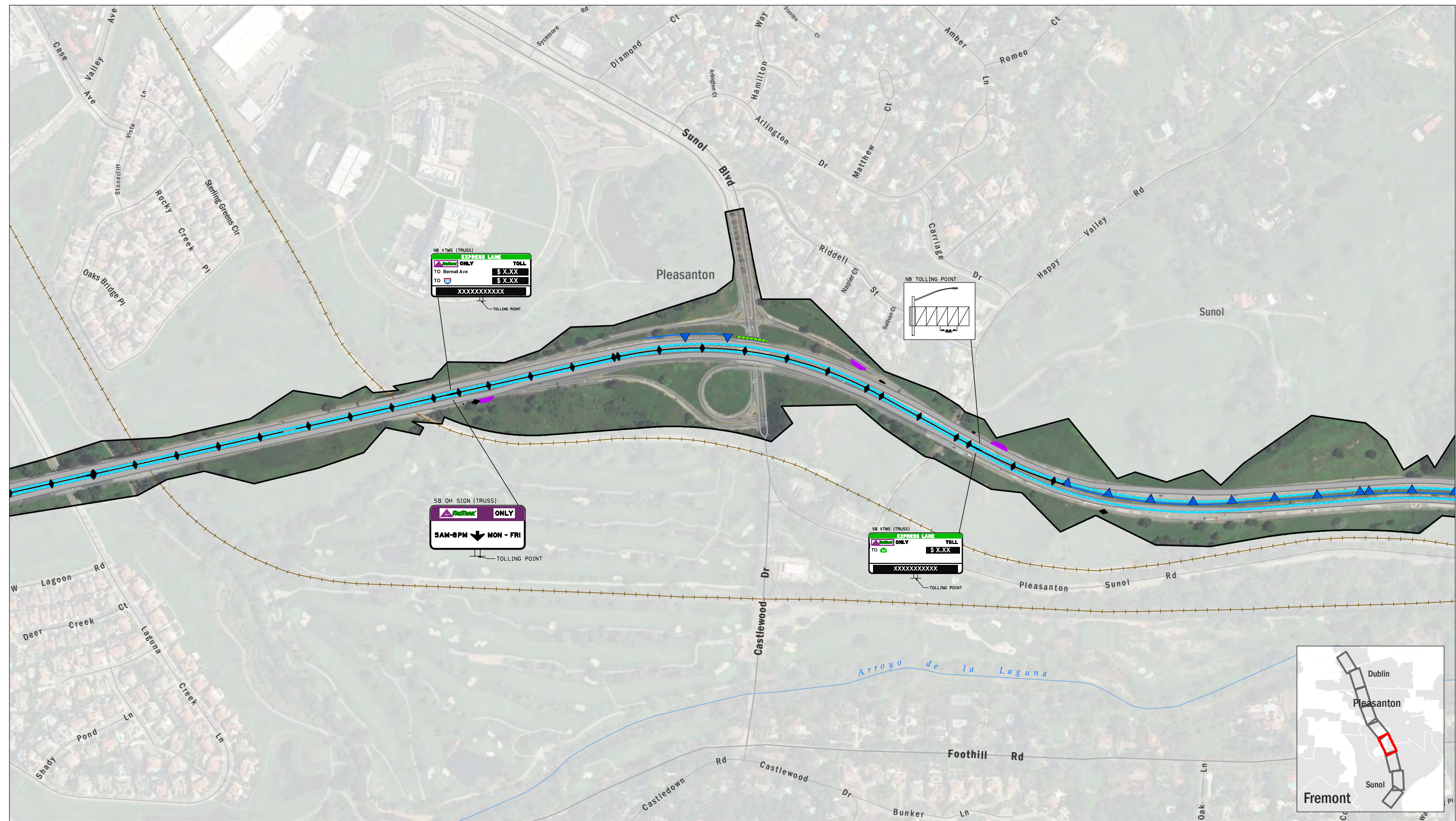


DATA SOURCE
ESRI, 2018
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AECOM Otto Alvarez,
5/27/2020

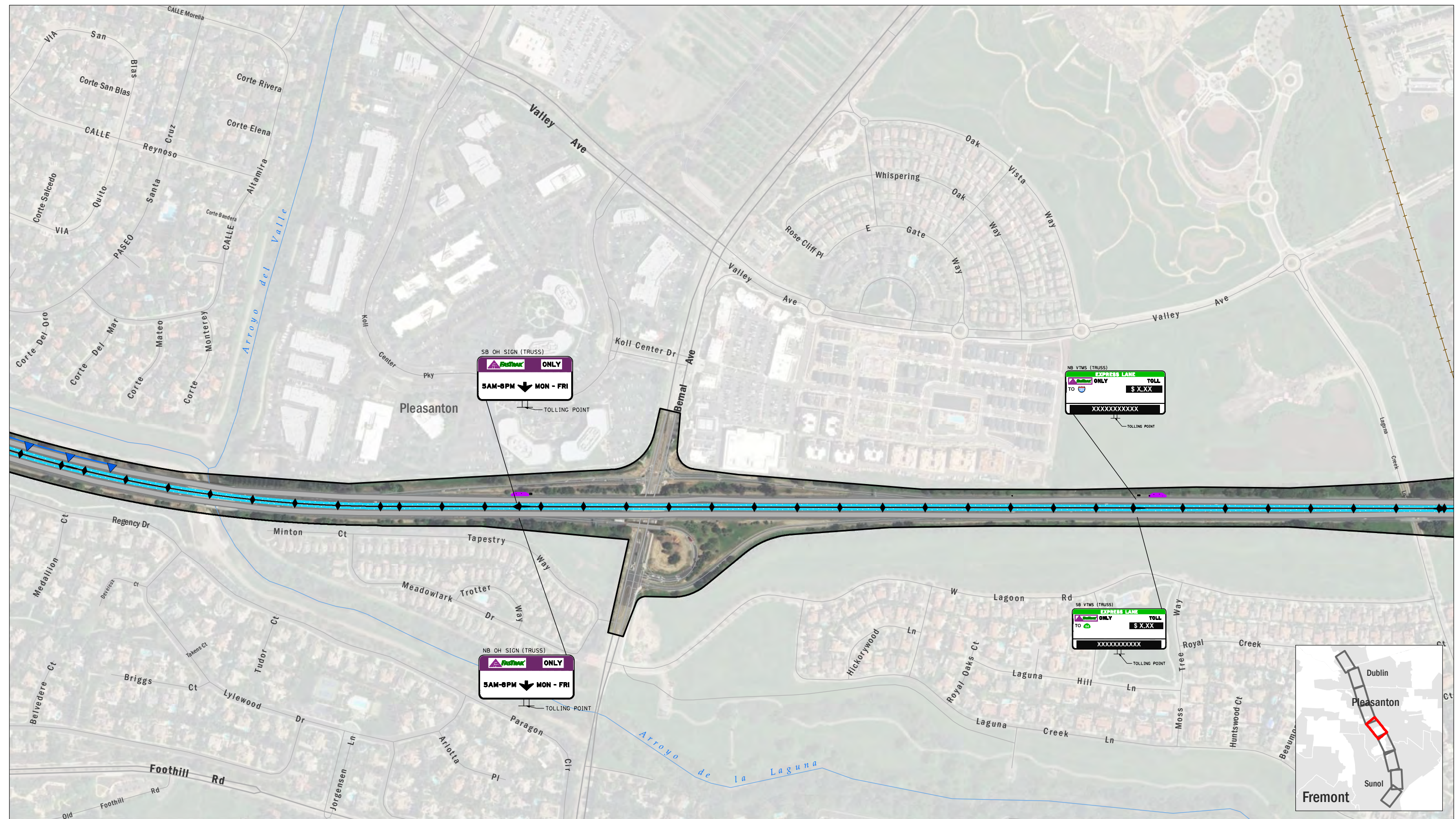


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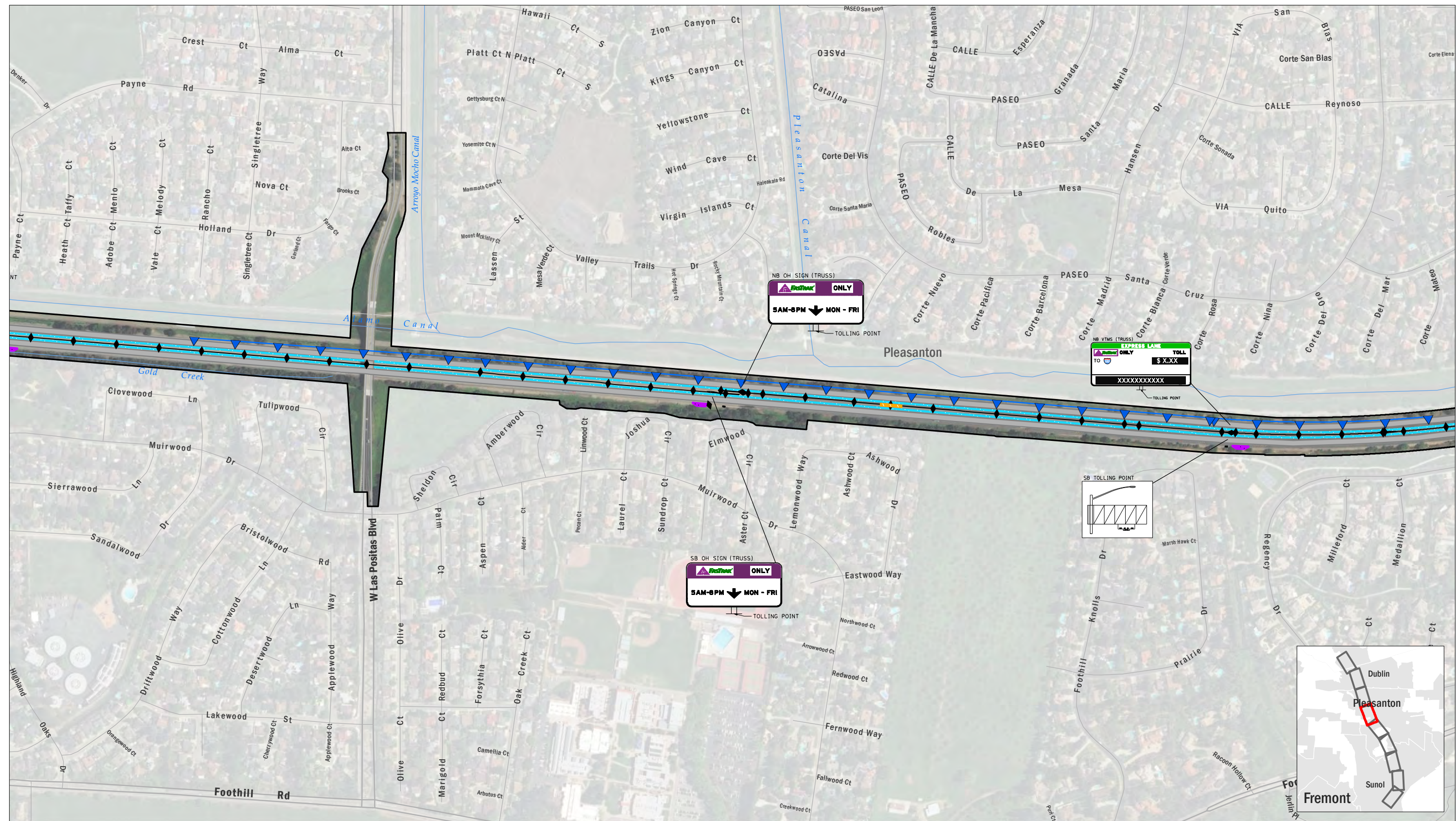




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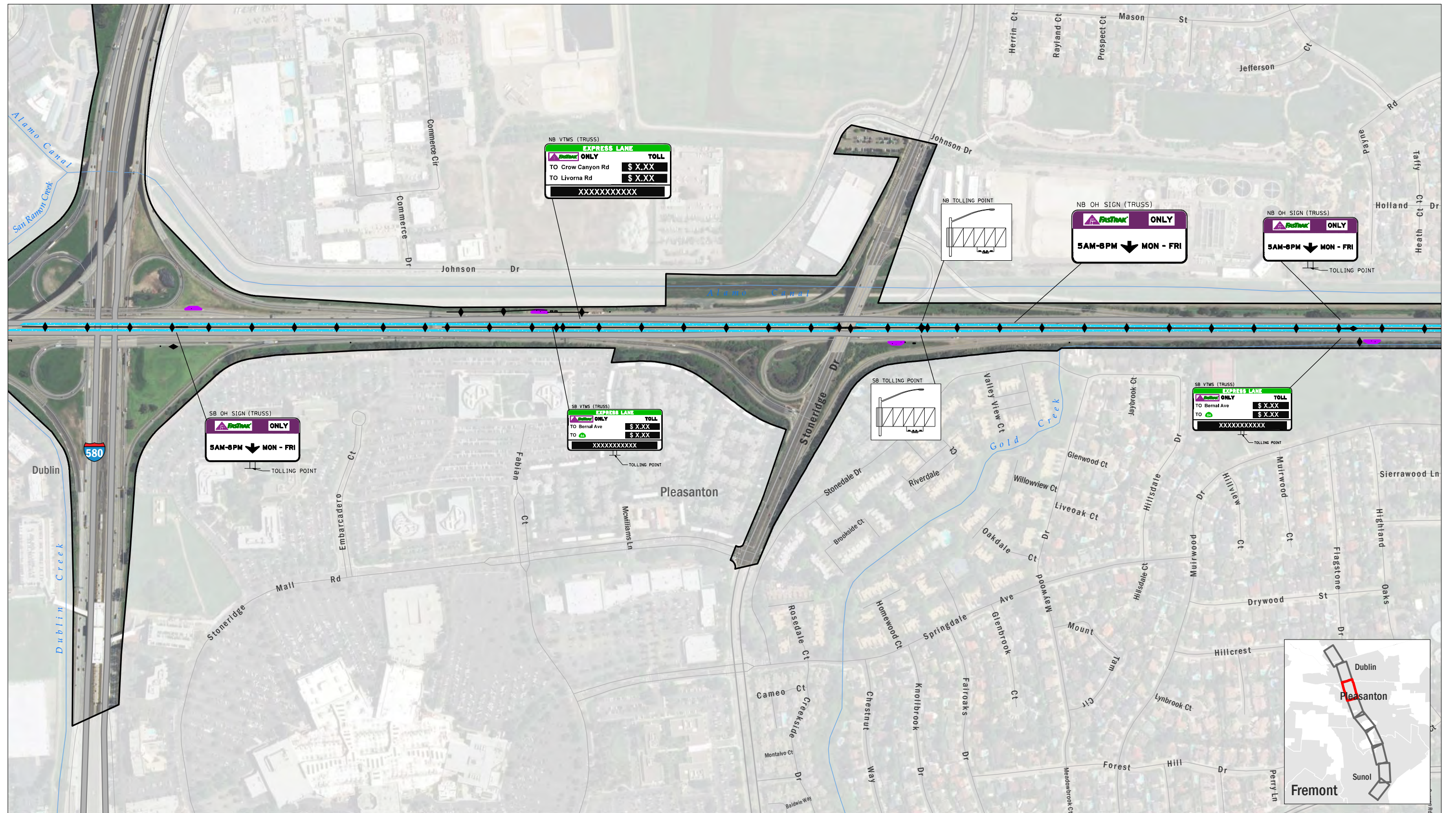
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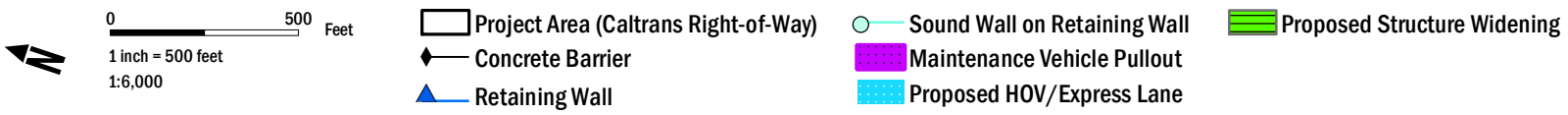
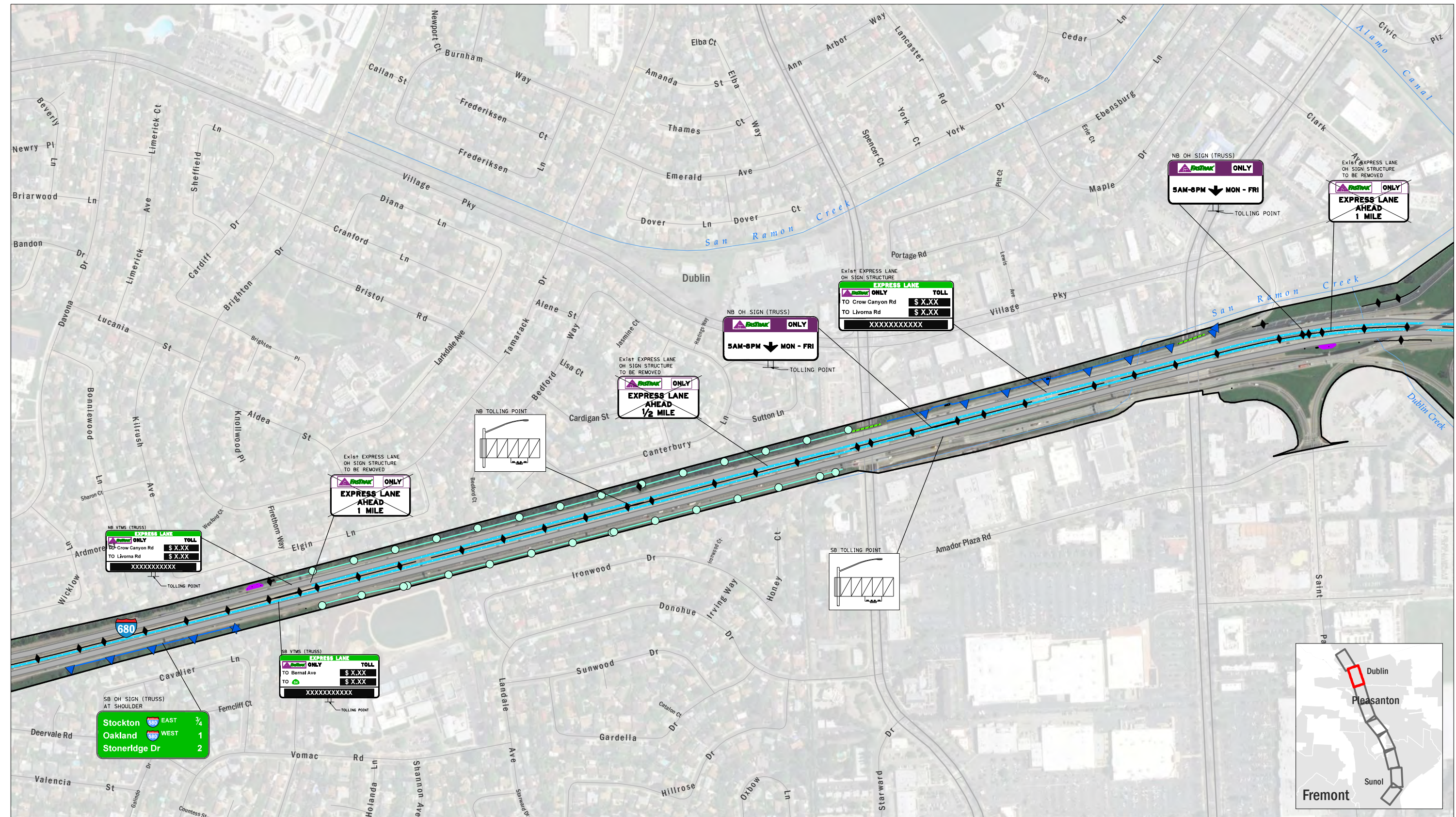
I-680 Express Lanes from State Route 84 to Alcosta Boulevard
Alameda and Contra Costa Counties

FIGURE 1.4-1
Project Layout
Page 6 of 9

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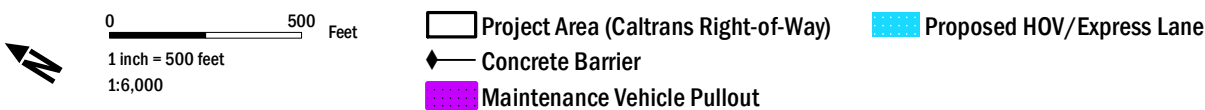
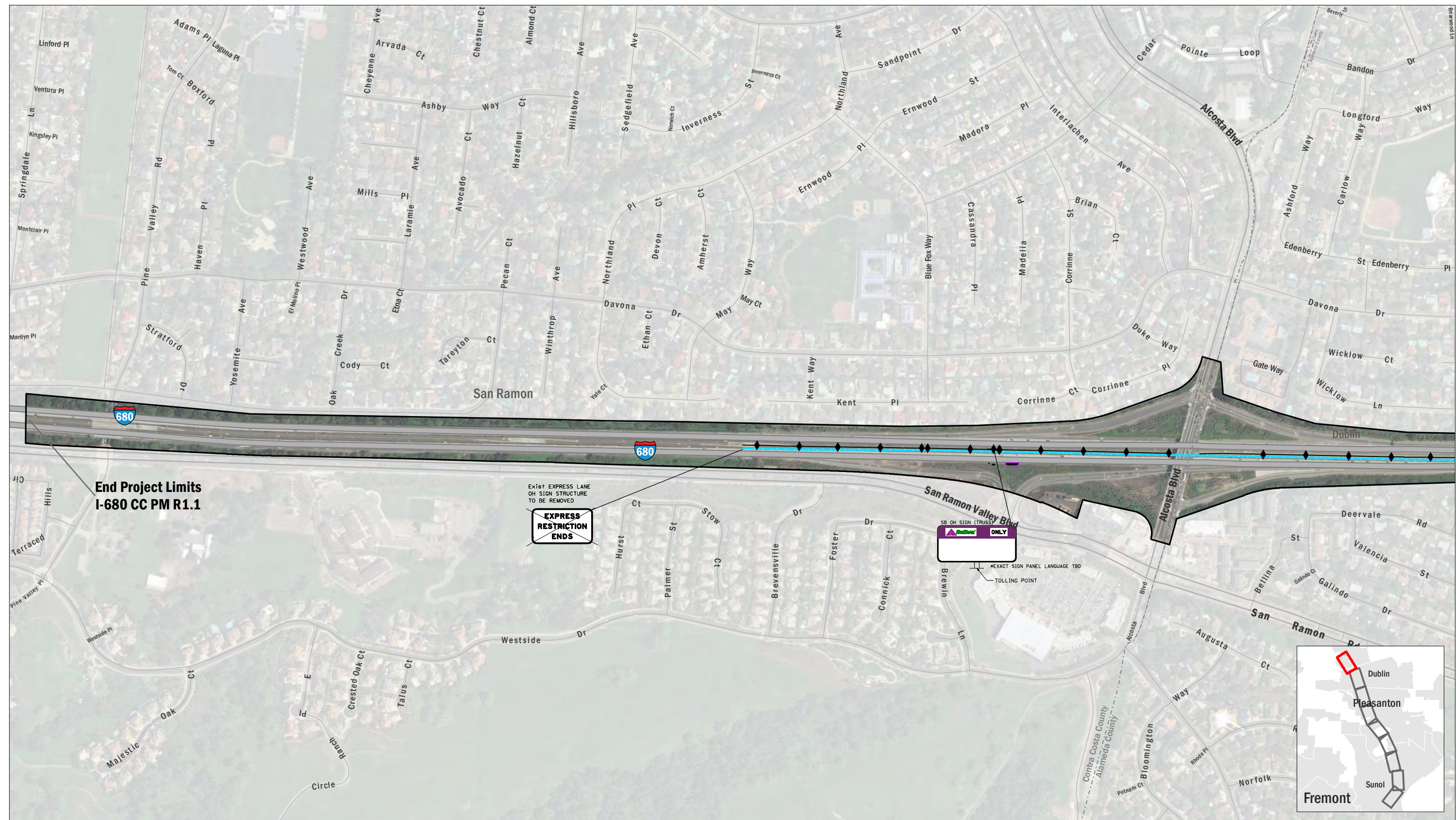
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I-680 Express Lanes from State Route 84 to Alcosta Boulevard
Alameda and Contra Costa Counties

FIGURE 1.4-1
Project Layout
Page 8 of 9

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I-680 Express Lanes from State Route 84 to Alcosta Boulevard
Alameda and Contra Costa Counties

FIGURE 1.4-1
Project Layout
Page 9 of 9

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Pricing and Tolling Equipment

Tolls for express lanes are dynamic, meaning they change periodically based on real-time traffic volumes. During periods of lower traffic congestion, the toll would be lower to encourage SOVs to pay the toll and use the additional capacity of the HOV/express lanes. During periods of higher traffic congestion, the toll would be higher to discourage SOVs from using the HOV/express lanes. Toll increases for SOVs would be used to meet the minimum average operating speed of 45 mph for HOVs (23 USC 166[d][2]). By raising or lowering the toll in response to the level of demand, dynamic pricing manages traffic volumes in the HOV/express lanes, ensuring that traffic flows smoothly.³

The Build Alternative would install overhead signs, toll gantries, toll readers and antennas, vehicle sensors, rear-plate facing cameras, enforcement beacons, closed-circuit television cameras, zone controllers, utility cabinets, CHP enforcement areas, and maintenance vehicle pullouts.

As noted in Section 1.3.2.2, HOV/express lanes exist on I-680 from north of Alcosta Boulevard to Rudgear Road in the southbound direction and Livorna Road in the northbound direction. The Build Alternative would connect with these lanes, which are operated by MTC. Alameda CTC has coordinated with MTC and the Bay Area Toll Authority during the development of this project and will continue to work with them to minimize project effects on their tolling infrastructure and system.

Signage

The HOV/express lane would include several types of signs to provide graphic or text messages that inform motorists of pricing by toll zone and operating rules. The approximate locations of overhead sign structures are shown in Figure 1.4-1.

Smaller signs would be mounted on the concrete median barrier, and larger signs would be mounted on cantilevered overhead sign structures spanning above the HOV/express lanes. The total height of the overhead sign structure (including the sign) would depend on the type of sign being mounted. A summary of the sign types is provided below.

- Variable Toll Message Sign (VTMS) – Electronic message signs would display two prices: one for the zone the driver is entering, and the other for traveling to an upcoming destination in the HOV/express lane facility. The prices shown upon a driver's entry into the HOV/express lane would apply regardless of whether they change during the driver's trip as a result of increased (or decreased) levels of traffic. VTMS signs would also notify HOV users they are allowed to use the express lane facility free of charge. These signs would be mounted on overhead structures and be located approximately 2 miles apart, with additional signs placed in advance of the express lane facility and near on-ramps with heavy traffic volumes.

³ Currently, in the southbound I-680 express lanes, the minimum toll during the morning commute (heavy traffic volumes) is \$1. When fewer vehicles are using the lane, the toll is a minimum of 30 cents. The toll will range from 30 cents to a maximum of \$7.50.

The signs would have sensors that automatically adjust the brightness of the toll cost numbers to ambient light conditions, so that the light-emitting diode (LED) components are no brighter than needed for motorist visibility at any time.

- Static/Nonelectrical Signs – Sign panels indicating FasTrak use only would be placed approximately 0.75 mile apart within each toll zone and no more than 0.5 mile after each VTMS.

1.4.1.2 Pavement Widening and Reconstruction

In the project area, I-680 contains three general-purpose lanes in each direction, except north of Dublin Boulevard, which has four general-purpose lanes in the northbound direction. The Build Alternative would add one HOV/express lane adjacent to the median in each direction of I-680 throughout the project limits, by reconstructing the paved median for a stronger structural section and widening the pavement as necessary on the inside or outside to minimize right-of-way (ROW), environmental, and roadway geometry impacts. All widening would take place within the existing freeway ROW.

The pavement widening and reconstruction needed is summarized in Table 1.4-1.

Table 1.4-1: Pavement Widening and Reconstruction Locations

Begin PM	End PM	Begin	End	Type of Work
R12.32	R12.45	South of Koopman Road	Koopman Road Undercrossing	NB Outside Widening
R12.55	R13.3	North of Koopman Road	North of Koopman Road	NB Outside Widening
R15.15	R15.41	South of Sunol Blvd	North of Sunol Blvd	NB Outside Widening
R17.30	R18.57	North of Bernal Ave	North of W Las Positas Blvd	NB Outside Widening
R19.05	R21.36	South of Stoneridge Drive	South of Alcosta Blvd	NB Outside Widening
R12.48	R12.72	Koopman Road Undercrossing	North of Koopman Road	NB Inside Widening; Reconstruct median pavement
R13.20	R15.02	North of Koopman Road	Happy Valley Road Undercrossing	NB Inside Widening; Reconstruct median pavement
R15.06	R20.31	Happy Valley Road Undercrossing	South of Dublin Blvd	NB Inside Widening; Reconstruct median pavement
R13.29	R15.26	North of Koopman Road	Sunol Blvd Undercrossing	SB Inside Widening; Reconstruct median pavement
R15.29	R21.77 (ALA) 0.35 (CC)	Sunol Blvd Undercrossing	North of Alcosta Blvd	SB Inside Widening; Reconstruct median pavement
R14.76	R15.01	South of Happy Valley Road	South of Happy Valley Road	SB Outside Widening
R19.17	R20.33	South of Stoneridge Drive	North of Stoneridge Drive	SB Outside Widening

Begin PM	End PM	Begin	End	Type of Work
R20.77	R21.59	Amador Valley Blvd Undercrossing	South of Alcosta Blvd	SB Outside Widening

The freeway lanes would be restriped after the pavement work is completed to accommodate the median HOV/express lanes. Existing auxiliary lanes, which typically extend between interchanges to allow vehicles to merge on and off of the freeway, would be maintained.

1.4.1.3 Bridge Widening

The proposed project would widen the bridges listed in Table 1.4-2. As all bridges would be widened in the northbound direction, this work is anticipated to take place during Phase 2.

Table 1.4-2: Bridge Widening Locations

Bridge No.	Bridge Name	Work Description	Location Description	Approx. Length (feet)	Approx. Area (square feet)
BR-1	Pleasanton Sunol Road Undercrossing (33-0387)	Northbound outside widening	I-680/Pleasanton Sunol Road	174	2,644
BR-2	Dublin Blvd Undercrossing (33-0373)	Northbound outside widening	I-680/Dublin Blvd	158	1,778
BR-3	Amador Valley Blvd Undercrossing (33-0356)	Northbound outside widening	I-680/Amador Valley Blvd	166	2,255

1.4.1.4 Concrete Barriers, Retaining Walls, and Sound Walls

As noted in Section 1.4.1.2, the Build Alternative would reconstruct the paved median for a stronger structural section. The existing concrete median barrier would be replaced, and additional concrete barriers would be placed along ramps and maintenance vehicle pullouts as shown in Figure 1.4-1.

New retaining walls would be installed at the locations listed in Table 1.4-3 and shown in Figure 1.4-1. The Build Alternative may require the relocation of two existing sound walls along northbound and southbound I-680, just north of Amador Valley Boulevard. The sound walls would be reconstructed along the tops of Retaining Walls 599 and 600, as shown in Table 1.4-3 and Figure 1.4-1 (Page 8 of 9). In addition, an existing sound wall along southbound I-680 north of Stoneridge Drive would provide feasible and reasonable criteria noise abatement if raised from 8 to 10 feet in height (Barrier 11; Section 2.2.6.4). The final decision on noise abatement will be made upon completion of the project design, as discussed further in Section 2.2.6.4.

Table 1.4-3: New Retaining Wall Locations

Wall No.	Structure Name	Work Description	Location Description	Maximum Height (feet)	Length (feet)
RW-153	Retaining Wall 153	Retaining Wall (fill)	Northbound I-680 right shoulder south of Koopman Road	10	455
RW-162	Retaining Wall 162	Retaining Wall (cut)	Northbound I-680 median north of Koopman Road	10	880
RW-180	Retaining Wall 180	Retaining wall (cut)	Northbound I-680 right shoulder north of Koopman Road	14	490
RW-213	Retaining Wall 213	Retaining wall (cut/fill)	Northbound I-680 median	20	8,649
RW-310	Retaining Wall 310	Retaining wall (fill)	Northbound I-680 right shoulder at Sunol Blvd	12	450
RW-424	Retaining Wall 424	Retaining wall (fill)	Northbound I-680 right shoulder north of Bernal Ave	9	6,645
RW-579	Retaining Wall 579	Retaining wall (fill)	Northbound I-680 right shoulder before Dublin Blvd	19	26
RW-581	Retaining Wall 581	Retaining wall (fill)	Northbound I-680 right shoulder between Dublin Blvd and Amador Valley Blvd	12	1,593
RW-599	Retaining Wall 599	Sound Wall on Retaining Wall (fill)	Northbound I-680 outside widening north of Amador Valley Blvd	12	3,194
RW-600	Retaining Wall 600	Sound Wall on Retaining Wall (fill)	Southbound I-680 outside widening north of Amador Valley Blvd	18	2,900
RW-633	Retaining Wall 633	Retaining wall (cut)	Southbound I-680 outside widening	10	941

1.4.1.5 Project Construction

The following activities and components are anticipated as part of project construction.

Construction Closures and Detours

Lane and partial freeway closures would be required during project construction. Most construction would occur during the daytime, with some nighttime closures. Full closure of I-680 is not anticipated; however, temporary nighttime lane closures would be needed for pavement overlay, striping, and installation of temporary barriers (Type K, also known as K-rail) along construction areas.

During Phase 2, temporary daytime and/or nighttime closures of local streets at all undercrossing structures would be needed to set up and remove falsework for bridge widening. Traffic would be detoured to the I-680/Sunol Boulevard interchange and Stanley Boulevard for

destinations in Pleasanton and Livermore. The closures would be timed so that detour routes are open.

Property access would be maintained throughout project construction, although single-night closures may be needed for paving and switching traffic.

Right-of-Way

At this time, no permanent ROW acquisitions, utility easements, or maintenance easements are anticipated for the Build Alternative. The locations of potential temporary construction easements are included in the project area.

Utilities

Temporary utility relocations may be needed to allow for structure construction. Permanent utility relocations are anticipated.

Maintenance Access

Maintenance vehicle pullout areas would be added to the outside edge of freeway shoulders at locations where vehicles and crews need to periodically maintain the tolling system equipment. These areas would typically be along the freeway or interchange ramps, within the state ROW. Maintenance vehicle pullouts would be approximately 45 feet long and 12 feet wide.

Electric Conduit

To provide electrical power and communications to the electronic tolling equipment and signage for the HOV/express lane facility, electrical and communications conduits and fiber would be extended from existing sources along the outside edge of pavement. Conduit and fiber will also be installed for Caltrans' use. Extending electrical and communication conduit and fiber would require trenching and/or horizontal directional drilling to bring these services to the electronic tolling equipment and signage. Installation of pull boxes, controller cabinets, and service enclosures for electrical and/or fiber optic conduits would also be required.

Safety Lighting

The Build Alternative would provide enhanced lighting to improve roadway visibility. Lighting may be upgraded at ramp merges and diverges, if necessary. Lighting would also be added to overhead signs and at the HOV/express lane entrance and toll zone boundaries, locations on the highway where visibility is restricted by barriers, locations where the median width is narrow and drivers may be exposed to headlight glare, and locations where concentrations of nighttime accidents are known to have occurred. The exact locations of new lighting would be determined during the final design phase.

The lighting would have LEDs configured at the minimum necessary illumination level and optimal angle to restrict light to the freeway right-of-way. Shields on the fixtures would be used to reduce light trespass to surrounding properties.

Water Quality

The Build Alternative is anticipated to result in a disturbed soil area (DSA) of approximately 75.42 acres. The DSA includes the proposed total construction area and any soil that will be exposed through pavement removal.

A Storm Water Pollution Prevention Plan (SWPPP) will be prepared before project construction, and SWPPP requirements will be inspected and maintained during construction. The SWPPP requires temporary best management practices (BMPs) for hazardous materials storage and soil stockpiles, inspections, maintenance, worker training, and release containment to prevent runoff into storm water collection systems or waterways. BMPs proposed for the Build Alternative include soil stabilization, sediment control, tracking control, nonstormwater management, and stormwater sampling and analysis.

The project design also includes permanent BMPs to avoid the potential for project-related storm water discharges to substantially alter drainage patterns, violate water quality standards, or substantially degrade water quality. Permanent BMPs proposed for the Build Alternative include pollution prevention and treatment strategies such as drainage culvert end devices, biofiltration strips and swales, and detention basins. Drainage culvert end devices such as flared end sections, tees, and rock slope protection are placed at culvert outlets to dissipate and disperse runoff. Biofiltration is a pollution control technique using vegetation to capture sediment and pollutants from storm water runoff. Biofiltration strips are vegetated sections of land that capture sediment and pollutants as storm water passes over it in sheet flows. Biofiltration swales are vegetated ditches with a layer of imported biofiltration soil underneath and a layer of permeable material with an underdrain further below, where storm water is directed in with a concentrated flow.

Design Standards

Caltrans establishes and supports the consistent application of highway design standards to ensure optimal safety for the traveling public and those who work to construct, operate, and maintain the State Highway System. Exceptions to these standards are necessary when the proposed design deviates from the standard design features presented in the *Caltrans Highway Design Manual*.

Caltrans Project Development Procedures Manual Chapter 21 defines Boldface design standards as those considered most essential to achievement of overall design objectives. Underlined design standards are important also, but allow greater flexibility in application to accommodate design constraints or be compatible with local conditions on resurfacing or rehabilitation projects.

The project area contains existing nonstandard design elements that do not meet the current design standards. Exceptions from Boldface and Underlined design standards would be required under the Build Alternative to minimize environmental impacts.

Coordination with Other Projects

Caltrans District 4 is implementing a programmed State Highway Operation and Protection Program project to rehabilitate the I-680 pavement in the southbound and northbound directions between Koopman Road and Alcosta Boulevard (04-ALA-680 PM M12.4/R21.9; EA 04-0J620). An Initial Study with Negative Declaration for the I-680 Pavement Rehabilitation Project was approved in May 2019, and the project is currently in the design

phase. Starting in July 2019, the project team for the proposed HOV/express lanes began coordinating with the rehabilitation project team to minimize potential rework, construction disruptions, and throwaway costs associated with the two overlapping projects. Options under consideration include combining the southbound pavement rehabilitation work with Phase 1 of the HOV/express lane project during construction. Design and construction operations for the two projects may be consolidated where economically and logistically advantageous.

Other Construction Activities and Requirements

This project contains a number of standardized project measures that are employed on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the proposed project. These measures are addressed in more detail in the Environmental Consequences sections in Chapter 2. The construction contractor would be required to follow all standard requirements and procedures to be included during detailed design, specifications, and permits or other authorizations.

The following are examples of standardized project measures that would be implemented as part of the Build Alternative.

Transportation Management Plan

During the final design phase for the Build Alternative, a Transportation Management Plan (TMP) will be prepared in accordance with Caltrans requirements and guidelines to minimize the construction-related delays and inconvenience for travelers in the project area. The TMP will address the potential traffic impacts as they relate to staged construction, detours, and other traffic handling concerns associated with construction of the proposed project. It will include:

- Distribution of press releases and other documents as necessary to notify local jurisdictions, agencies, and the public of upcoming road closures and detours;
- Coordination with CHP and local law enforcement on contingency plans;
- Use of portable Changeable Message Signs, CHP Construction Zone Enhanced Enforcement Program, and Freeway Service Patrol where possible to minimize delays.

Access will be maintained for emergency response vehicles.

Highway Planting

Replacement planting will be installed in areas where planting is removed by construction activities and to provide screening. Highway planting and irrigation would be installed under a separate construction contract, funded by the parent roadway contract and would follow completion of the roadway construction contract. A three-year plant establishment period would be included.

Erosion Control and Construction Discharges

The following standard practices for erosion control and construction discharges would be part of the project:

- As part of construction, no debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the United

States or drainages. No discharges of excessively turbid water will be allowed, and all equipment will be well-maintained and free of leaks.

- A SWPPP and erosion control BMPs will be developed and implemented to minimize any wind or water-related material discharges, in compliance with the requirements of the Regional Water Quality Control Board (RWQCB) as well as the 2018 Caltrans Standard Specifications, Section 13. The SWPPP will provide water pollution control practices to limit storm water and nonstormwater discharges; temporary construction BMPs will be used to the maximum extent necessary.
- Erosion control methods may include silt fencing, straw wattles, straw bales, coir blankets, sediment traps, and other protective methods to limit the potential for erosion of sediment beyond the work area.

Geotechnical Design Standards

Caltrans' design and construction guidelines incorporate engineering standards that address seismic risks. Project elements will be designed and constructed to meet seismic design requirements for ground shaking and ground motions, as determined for the project vicinity and site conditions. Caltrans also requires additional geotechnical subsurface and design investigations to be performed during the final project design and engineering phase.

Executive Order 13112

Compliance with Executive Order (EO) 13112 on Invasive Species is a standard practice that Caltrans adheres to for all projects. In compliance with EO 13112, and subsequent guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will use species that are not listed as noxious weeds. The following methods will be used in accordance with standard construction practices:

- No disposal of soil and plant materials will be allowed from areas that support invasive species to areas dominated by native vegetation.
- Construction workers will be educated on weed identification and the importance of controlling and preventing the spread of identified invasive nonnative species.
- Gravel and/or fill material to be placed in relatively weed-free areas will come from weed-free sources. Certified weed-free imported materials (or rice straw in upland areas) will be used.

1.4.1.6 Traffic Systems Management and Traffic Demand Management Alternatives

Traffic Systems Management (TSM) strategies increase the efficiency of existing facilities by accommodating a greater number of vehicle trips without increasing the number of through lanes. Examples of TSM strategies include ramp metering, traffic operation systems, auxiliary lanes, turning lanes, reversible lanes, and traffic signal coordination. TSM also promotes automobile, public and private transit, ridesharing programs, and bicycle and pedestrian improvements as elements of a unified urban transportation system. Modal alternatives integrate multiple forms of transportation modes, such as pedestrian, bicycle, automobile, rail, and mass transit.

TSM strategies such as ramp metering, traffic operation systems, and auxiliary lanes are already in use within the project limits, and the proposed HOV/express lanes would encourage ridesharing and transit use and increase the efficiency of I-680. Additional traffic operation systems for transportation management will be installed as part of this project. 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: vehicle detection systems to monitor traffic speed and density, and enforcement, incident management, and other subsystems to maintain acceptable traffic flow in the HOV/express lanes.

Traffic Demand Management focuses on regional means of reducing the number of vehicle trips and vehicle miles traveled (VMT) as well as increasing vehicle occupancy. The proposed HOV/express lanes would help to facilitate transit use and ridesharing. In addition, the vehicle detection systems for monitoring traffic speed and density to maintain an acceptable level of service (LOS) in the HOV/express lanes would benefit transit and other HOVs.

1.4.1.7 Estimated Project Cost and Funding

The current preliminary total cost estimate, including the support cost for the project, is approximately \$349 million. The estimated total project funding is \$480 million. Currently \$30 million is programmed from Alameda County local tax measures. Additional funding is anticipated from Senate Bill (SB) 1, regional measures, State TIP funds, and other local funds.

1.4.2 No Build Alternative

The No Build Alternative would not construct HOV/express lanes in each direction of I-680 or increase the capacity of I-680 within the project limits. I-680 would continue to have three general-purpose lanes in each direction, except north of Dublin Boulevard, which has four general-purpose lanes in the northbound direction. Existing or in-construction HOV/express lanes would border the project area to the north and south, as described in Section 1.3.2.2. This alternative assumes maintenance of the existing facility and the construction of other planned and programmed projects on I-680 within the project limits through the year 2045, including the following:

- I-680 Sunol Express Lanes Project – Northbound (EA 4G050), which is constructing an HOV/express lane on northbound I-680 from SR 262 (Mission Boulevard) to north of the SR 84 interchange.
- I-680 Pavement Rehabilitation Project between Koopman Road and Alcosta Boulevard (EA 04-0J620), which would resurface and restore the I-680 roadway and ramps and improve drainage facilities, guardrails, concrete barriers, and other roadway features.
- SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 297631), which would widen and conform SR 84 to expressway standards between south of Ruby Hill Drive and I-680, improve SR 84/I-680 interchange ramps, and extend the existing southbound I-680 HOV/express lane northward by approximately 2 miles, to approximately 0.8 mile north of Koopman Road.

The No Build Alternative represents the baseline condition against which the Build Alternative will be compared.

1.4.3 Final Decision Making Process

After the public circulation period, all comments will be considered, the Project Development Team (PDT) will select a preferred alternative, and Caltrans will make the final determination of the project's effect on the environment.

Under CEQA, if no unmitigable significant adverse impacts are identified, Caltrans will prepare a Mitigated Negative Declaration (MND).

Similarly, if Caltrans, as assigned by FHWA, determines the NEPA action does not significantly impact the environment, Caltrans will issue a Finding of No Significant Impact.

1.4.4 Alternatives Considered but Eliminated from Further Discussion

The following alternatives were considered and analyzed during the project initiation phase and early stages of the PA&ED phase. Other than specific components of alternatives that were incorporated into previous projects or the proposed Build Alternative, these alternatives were ultimately rejected and withdrawn from further study for the reasons described below.

Separate HOV/Express Lane Segments

During the PA&ED phase, the PDT considered shorter HOV/express lane segments to provide incremental improvements in congestion if funding was not available to build the complete project. The following segments were considered:

- **Southbound Only: I-580 to SR 84.** This alternative would construct an HOV/express lane on southbound I-680 from the I-580/I-680 interchange to the southern project limit. There, it would connect with a future HOV/express lane to the south that will be constructed as part of another project (EA 04-29763; see Section 1.3.2.2) and continue to the existing southbound express lane from south of the SR 84 interchange to SR 237 in Milpitas. Constructing a southbound HOV/express lane in this area would allow vehicles to enter the lane to the north of the AM peak bottleneck between Sunol Boulevard and Koopman Road, bypassing the bottleneck and also alleviating congestion in the general-purpose lanes. Extending the southbound HOV/express lane to the I-580/I-680 interchange area would also help to alleviate a PM peak period bottleneck at the Stoneridge Drive interchange.
- **Northbound Only: SR 84 to Las Positas Boulevard.** This alternative would construct an HOV/express lane on northbound I-680 from the southern project limit to approximately the Las Positas Boulevard overcrossing between the Bernal Avenue and Stoneridge Drive interchanges. This northbound HOV/express lane would connect in the south with the express lane that is under construction on northbound I-680 from SR 262 (Mission Boulevard) to north of the SR 84 interchange (EA 4G050). The HOV/express lane would allow vehicles to enter the lane to the south of the PM peak period bottleneck between Stoneridge Drive and I-580, bypassing the bottleneck and also alleviating congestion in the general-purpose lanes.
- **Southbound from I-580/Northbound from Las Positas Boulevard to Alcosta Boulevard.** This alternative would construct HOV/express lanes on southbound and northbound I-680 from the northern termini of the Southbound Only and Northbound Only segments

described above to the project limits north of Alcosta Boulevard. Construction of this segment would connect the previously completed HOV/express lanes with the existing HOV/express lanes north of Alcosta Boulevard, which extend to Rudgear Road in the southbound direction and Livorna Road in the northbound direction (EA 3G950/3G910).

Although each segment would provide incremental congestion relief, no single segment would address congestion throughout the project limits. All three segments would have to be constructed to address the project's purpose and need. The segments would not have logical termini or independent utility based on the criteria discussed in Section 1.3.3. Therefore, the segment alternatives were eliminated from further consideration.

Reversible Traffic Lanes

California Assembly Bill (AB) 2542 (2016; effective January 1, 2017) requires that, prior to the approval of a capacity-increasing project or major street or highway lane realignment project by the California Transportation Commission, Caltrans or a regional transportation planning agency must demonstrate that reversible lanes were considered for the project. Reversible lanes add peak-direction capacity to a two-direction roadway and decrease congestion by using the available capacity from the direction of traffic that is not experiencing peak period congestion. In addition, these lanes provide a cost benefit in cases where increasing the capacity is especially expensive, particularly on bridges and in dense urban areas. With the implementation of reversible lanes, roads may be adjusted ranging from a one-way road to having a middle lane that operates in the peak direction. Changeable signs and/or arrows are used to indicate the adjustment at specified times of day, or when volume exceeds the capacity of the roadway.

Reversible traffic lanes on I-680 were considered for the proposed project. The traffic analysis shows that for the 2025 No Build scenario, the bottleneck along southbound I-680 between Sunol Boulevard and Koopman Road is expected to be active in the AM peak period, and the bottleneck along southbound I-680 between Stoneridge Drive and Bernal Avenue is expected to be active in the PM peak period. These bottlenecks require the capacity of all southbound lanes during both peak periods and are too close together to allow for reversible lanes. Also, the grade differences of up to 17 feet between northbound and southbound I-680 between SR 84 and Sunol Boulevard (from PM 11.9 to 12.7, approximately 0.9 mile; and from PM 13.1 to 15.0, approximately 2 miles) would make a reversible lane geometrically infeasible.

1.4.5 Permits and Approvals Needed

Table 1.4-4 shows the permits, reviews, and approvals that would be required for project construction.

Table 1.4-4: Permits and Approvals Needed

Agency	Permit/Approval	Status
U.S. Army Corps of Engineers (USACE)	Concurrence on delineation of waters of the U.S., and Section 404 permit for placement of fill within waters of the U.S.	<ul style="list-style-type: none"> • The Jurisdictional Delineation was submitted to USACE for concurrence on 11/18/2019, and USACE issued a preliminary jurisdictional delineation on 4/7/20. • A permit application will be submitted during the project design phase.
United States Fish and Wildlife Service (USFWS)	Section 7 consultation for threatened and endangered species	<ul style="list-style-type: none"> • A Biological Assessment was submitted to the USFWS on 11/15/19.
Federal Highway Administration (FHWA)	Concurrence with project's conformity to Clean Air Act and other requirements	<ul style="list-style-type: none"> • Air quality studies will be submitted for FHWA concurrence after public review of this IS/EA.
California Department of Fish and Wildlife (CDFW)	Section 1602 Lake and Streambed Alteration Permit and Consistency Determination or Incidental Take Permit	<ul style="list-style-type: none"> • Permit application and request for Consistency Determination or Incidental Take Permit will be submitted during the project design phase.
San Francisco Bay Regional Water Quality Control Board (RWQCB)	Waste discharge requirements (WDRs) under the Porter-Cologne Water Quality Control Act; National Pollutant Discharge Elimination System (NPDES) approval for work greater than one acre	<ul style="list-style-type: none"> • A joint "Application for 401 Water Quality Certification" and/or "Report of Waste Discharge" will be submitted during the project design phase. • An NPDES permit application will be submitted during the project design phase. • A Notice of Intent and SWPPP will be prepared/submitted before construction.

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. An evaluation of the proposed project consistent with CEQA checklist criteria is provided in Section 3.2. Avoidance, minimization, and/or mitigation measures are discussed in the following sections and summarized in Appendix E.

For the proposed project, the CEQA baseline for all resource areas is 2018, when environmental studies commenced. The NEPA baseline for comparing environmental impacts is the No Build Alternative.

Topics Considered but Determined Not to Be Relevant

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.

Coastal Zone

The proposed project is not located within the coastal zone or Bay Conservation and Development Commission jurisdiction; therefore, no coastal zones would be affected by the proposed project.

Wild and Scenic Rivers

No wild and scenic rivers are located in or adjacent to the project area; therefore, wild and scenic rivers would not be affected by the proposed project.

Farmlands/Timberlands

Land uses adjacent to the project area include nonprime agricultural land, including land enrolled under the California Land Conservation Act (also known as Williamson Act lands), prime farmland (south of Paloma Way in Sunol), and grazing land (Department of Conservation 2016; 2015). All agricultural lands adjacent to the project area are in Alameda County. Since the project would include no work outside of the existing State ROW, it would not conflict with any existing land use designations, including farmlands. The project would not convert any farmlands to nonfarmland uses.

No timberlands exist in or adjacent to the project area; therefore, timberlands would not be affected by the proposed project.

Community Character and Cohesion

The proposed project would not change any existing community boundaries or physically divide an established community. The project would not change the existing character of the communities in the project area.

Relocations and Real Property Acquisition

The proposed project would not result in the relocations of homes or businesses, and no property acquisition is proposed.

Geology/Soils/Seismicity/Topography

As noted in Section 1.4.1.5, Caltrans' design and construction guidelines incorporate engineering standards that address seismic risks. Project elements will be designed and constructed to meet seismic design requirements for ground shaking and ground motions, as determined for the project vicinity and site conditions. Caltrans also requires additional geotechnical subsurface and design investigations to be performed during the final project design and engineering phase. These standards and requirements would avoid the potential for adverse impacts.

2.1 Human Environment

2.1.1 Existing and Future Land Use

2.1.1.1 Affected Environment

The following discussion is from the *Community Impact Assessment* completed for the proposed project in January 2019 (AECOM 2019a). The community impact study area includes Alameda and Contra Costa Counties; the unincorporated community of Sunol; and the cities of Pleasanton, Dublin, and San Ramon.

Existing Land Use

The project area is located within the State ROW along I-680. Land uses adjacent to the project area consist of both urban/developed land and open space. From San Ramon to Pleasanton, land uses adjacent to the project area are mainly single family residential and industrial. South of Pleasanton through the Sunol area, land uses adjacent to the project area are dominated by undeveloped land and open space. Other existing land uses adjacent to the project area include industrial, residential, public/semi-public, agricultural, and open space uses.

Land use designations for each jurisdiction overlapping the project are shown in Table 2.1.1-1.

Table 2.1.1-1: Land Use in the Project Area by Jurisdiction

Jurisdiction	Land Use Designation
Contra Costa County	Single family residential medium, mixed-use, commercial, public/semi-public, open space
City of San Ramon	Single family low/medium density, single family medium density, multiple family high density, multiple family very high density, public and semi-public, parks, golf course, mixed-use, retail shopping, open space
City of Dublin	Single family residential, medium/high density residential, general commercial, downtown Dublin – retail district, downtown Dublin – Village Parkway district, downtown Dublin – transit-oriented district, retail/office, public/semi-public, parks/public recreation, medium density residential, business park/industrial, open space, retail/office and automotive, mixed-use, parks/public recreation
City of Pleasanton	Rural density residential, low density residential, medium density residential, high density residential, retail/highway/service commercial business and professional offices, community facilities - elementary school, community facilities - high school, mixed-use, parks and recreation, community facilities - other public and institutional, business park, open space - public health and safety, agriculture and grazing, community facilities - fairgrounds
Alameda County (Sunol)	Water management, resource management, large parcel agriculture, non-open space lands

Sources: Contra Costa County 2017; City of San Ramon 2017; City of Dublin 2016; City of Pleasanton 2012a; Alameda County Community Development Agency 2002

Land Use Trends

The jurisdictions in the study area have policies to support employment and housing development while preserving agricultural and open space. San Ramon, Dublin, Pleasanton, and Sunol (part of unincorporated Alameda County) all have urban growth boundaries (UGBs) or urban limit lines that restrict where and what type of development can occur in the future. The UGBs/urban limit lines are described in the San Ramon, Dublin, and Pleasanton General Plans, and, for Sunol, the East County Area Plan (City of San Ramon 2017; City of Dublin 2016; City of Pleasanton 2015; Alameda County Community Development Agency 2002).

San Ramon has little vacant land remaining for new development within the city limits. Accordingly, land use trends consist of the continued annexation of adjacent unincorporated areas within the UGB, and intensification of land use density by encouraging infill and redevelopment projects within existing urban areas. The City has incorporated “smart growth” principles through the creation of mixed-use districts to accommodate commercial and residential uses as well as a continuing commitment to regional programs that promote compact growth patterns. A key effort is through establishment of priority development areas (discussed further in Section 2.1.2.1), which require compact growth with pedestrian-oriented development and transit connections (City of San Ramon 2017).

The majority of the primary planning area of Dublin has been developed since the 1960s; therefore, land use trends will focus on the remaining uncommitted sites and on the potential for more intensive use of existing sites. In recent years, Dublin has sought opportunities to redevelop underutilized commercial sites for mixed residential and retail commercial with a pedestrian-friendly environment. In addition, a Transit Oriented District was created around the West Dublin Bay Area Rapid Transit (BART) Station to encourage the development of higher density, mixed-use projects adjacent to mass transit (City of Dublin 2016).

Pleasanton utilizes the UGB, a growth management ordinance that establishes an annual limit by category for new residential units, and a defined holding capacity to limit growth. Inside the UGB, the land use trend focuses on integrating residences with other land uses in mixed use and transit-oriented developments and creating more pedestrian, bicycle, and public transit connections that provide an alternative to automobiles. The General Plan provides for varied housing needs by designating a wide range of residential densities and adopting policies aimed at all economic segments of the community, such as by designating high-density residential and mixed-use land within and adjacent to business parks (City of Pleasanton 2010).

The community of Sunol is outside of the UGB set in the East County Area Plan, which strictly limits growth in unincorporated areas of the county that do not fall within the general plan boundaries of Dublin, Livermore, Pleasanton, and a portion of Hayward. Other than downtown Sunol, the majority of lands outside of the UGB in the Sunol area are designated for water management, resource management, and large parcel agriculture; the only residential land uses, which are not directly adjacent to I-680, are rural density residential, with a maximum of one unit per 5 acres. For unincorporated areas, the plan provides for an increase of only 170 housing units between 1990 and plan buildout, and no increase in jobs (Alameda County Community Development Agency 2002). Therefore, the land use trend in Sunol is maintenance of agriculture and open space and other low-density uses outside of the UGB.

Future Land Use

Future developments proposed within 0.75 mile of the project area are described in Table 2.1.1-2. This distance was chosen to capture the neighborhoods that border the project area. The information in Table 2.1.1-2 was obtained from CEQAnet (2019) and the planning and public works departments for the cities of San Ramon, Dublin, and Pleasanton. Residential development planned in the vicinity of the project area is limited to low density/single family residential development. The developments are all within UGBs or already developed areas.

Table 2.1.1-2: Current and Proposed Planned Developments within 0.75 Mile of the Project Area

Project Proponent/Name	Description	Status	Location (Approximate Distance from Project Area)
City of Pleasanton/Johnson Drive Economic Development Zone	Johnson Drive Economic Development Zone would facilitate development and redevelopment within the 40-acre area for club retail, hotel, recreational, and small- and large-format general retail establishments.	Supplemental Environmental Impact Report (EIR) published	7106 through 7315 Johnson Drive and 7035 and 7080 Commerce Circle (approximately 250 feet east)
Alameda County/Dublin Transit Center Parking Garage	Project would construct a new 5-story freestanding public parking garage, providing approximately 570 parking spaces for vanpool, electric vehicle, and other vehicle commuters from the Livermore-Amador Valley and beyond to the transit hub at the Dublin-Pleasanton BART station.	Notice of Determination posted	I-580 at I-680 in Pleasanton (directly adjacent to project)
City of Pleasanton/Dutra Enterprises	Planned unit development on 11.65 acres, with 5 residential lots and 1 open space lot.	Planned unit development designation approved; no development application submitted	1053 Happy Valley Road, Pleasanton (0.5 mile east)
City of Dublin/Dublin High School Engineering & Science Building and Interim Housing Phase 1B	Construction of new building containing about 48,000 gross square feet at the site of an existing building that would be demolished. The Interim Housing Phase 1B would provide classrooms and restrooms totaling about 12,960 gross square feet. The project would increase student capacity at Dublin High School by a total of 1,196 students.	Notice of Preparation of an EIR published	8151 Village Pkwy, Dublin (0.5 mile east)

Project Proponent/Name	Description	Status	Location (Approximate Distance from Project Area)
Spotorno Ranch Project	Residential development with 39 single-family lots and roadways on a 31-acre portion of the site. The area that would be developed is in the western portion of the site in the vicinity of existing residential development, while the larger area to the east would be preserved as open space. Residential lots would range in size from 17,216 sf (0.39 acre) to 38,331 sf (0.88 acre).	Notice of Preparation of an EIR published	Alisal Street & Westbridge Lane, Pleasanton (0.75 mile east)

Sources: City of Pleasanton 2019; CEQAnet 2019

2.1.1.2 Environmental Consequences

Since the No Build Alternative and the Build Alternative would include no work outside of the existing State ROW, neither alternative would conflict with any existing land use designations, or preclude the development of any of the proposed projects listed in Table 2.1.1-2.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.1.1.3 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

2.1.2 Consistency with State, Regional, and Local Plans and Programs

2.1.2.1 Affected Environment

The following discussion is from the *Community Impact Assessment* completed for the proposed project in January 2019 (AECOM 2019a).

There are several community, regional, and transportation plans that include the project area. The following types of plans were considered and are discussed in the subsections below:

- Transportation plans/programs
- Regional growth plans
- General and community plans
- Habitat conservation plans
- Other regulatory and planning influences

Transportation Plans/Programs

This project is included in *Plan Bay Area 2040*, the RTP for the nine-county San Francisco Bay Area (ABAG and MTC 2017a, amended 2020; RTP ID 17-10-0065). The RTP lists projects of local and regional importance based on factors such as local support and need, ridership, and potential cost and funding. These factors provide direction on how anticipated federal, state, and local transportation funds will be spent in the Bay Area during the next 24 years.

In addition to including the proposed project, *Plan Bay Area* includes the continued development of a Regional Express Lane Network. Express lanes utilize increased technology (monitoring and enforcement) to take advantage of available capacity in under-used carpool lanes and to improve traffic management and reliability on well-utilized carpool lanes. With toll revenue, express lanes can offer enhanced enforcement, access control to manage merging and weaving, and more cameras and sensors to quickly identify and respond to incidents. Travelers have the choice whether to use express lanes, and the toll revenue would first fund the operations and maintenance of the lanes. The Regional Express Lane Network will leverage revenues generated from pricing to improve the existing system's efficiency while providing alternatives to driving (ABAG and MTC 2017).

The project is also included in Alameda CTC's 2016 Alameda Countywide Transportation Plan and 2014 Alameda County Transportation Expenditure Plan (Alameda CTC 2016; 2014). The Alameda Countywide Transportation Plan sets goals for the County's transportation system to be multimodal; accessible, affordable, and equitable for people of all ages, incomes, abilities and geographies; integrated with land use patterns and local decision-making; connected across the county, within and across the network of streets, highways and transit, bicycle and pedestrian routes; reliable and efficient; cost effective; well maintained; safe; and supportive of a healthy and clean environment. The plan also identifies the need to continue to develop policies to encourage revenue generation from HOV/express lanes (Alameda CTC 2016).

The 2014 Alameda County Transportation Expenditure Plan (Alameda CTC 2014) identifies projects to be funded by tax proceeds from 2014 Alameda County Measure BB, which extended

the existing Measure B half-cent transportation sales tax by a half-cent through April 1, 2045. The plan identifies the addition of new express lanes on I-680 and closing of gaps with HOV infrastructure as needed to relieve congestion on important highway corridors (Alameda CTC 2014).

Regional Growth Plan and Sustainable Communities Strategy

Plan Bay Area 2040 (ABAG and MTC 2017a) also functions as a regional growth plan and sustainable communities strategy (SCS) for the nine-county San Francisco Bay Area. Through its function as a regional growth plan, *Plan Bay Area 2040* designates priority development areas (PDAs), which are areas within existing communities that have been identified and approved by a local city or county for future growth because of proximity to transit, jobs, shopping, and other services. Promoting compact development within PDAs is intended to take development pressure off the region's open space and agricultural lands (ABAG 2016).

Two PDAs have been designated within 0.75 mile of the proposed project area. This distance was chosen to capture the neighborhoods that border the proposed project area. The Dublin Downtown Specific Plan PDA overlaps the project area, and the Hacienda Business Park PDA is 0.6 mile from the project area. Each PDA is described below.

- The Dublin Downtown Specific Plan PDA is a 284-acre area located adjacent to and overlapping the project area in the northwest corner of the I-580/I-680 interchange. The plan area contains mainly retail, restaurant, and commercial services with some light industrial uses and senior housing. The Dublin Downtown Specific Plan area is served by the Livermore Amador Valley Transit Authority bus Routes 3, 10, and 10R, which provide access to the Dublin/Pleasanton Bay Area Rapid Transit station.
- The Hacienda Business Park PDA in Pleasanton is a 733-acre area located south of I-580 and east of Hopyard Road in Pleasanton. The PDA includes residential, retail, institutional, and public land uses in the vicinity of Dublin-Pleasanton Bay Area Rapid Transit. Other transit that serves the PDA includes Wheels, County Connection (Contra Costa), Modesto Commuter Express, San Joaquin Regional Transit, Tri Delta Transit, and Amtrak Capital Corridor connections (ABAG 2016).

Through its function as an SCS, *Plan Bay Area 2040* integrates transportation, land use, and housing policies to demonstrate how the Bay Area will achieve greenhouse gas reduction targets set by the California Air Resources Board, in accordance with SB 375.

General Plans and Community Plans

East County Area Plan. The East County Area Plan (adopted in 1994; most recently updated in 2002) covers 418 square miles of eastern Alameda County, from the Pleasanton/Dublin ridgeline on the west to the San Joaquin County line on the east and from the Contra Costa County line on the north to the Santa Clara County line on the south. The plan area encompasses part of the project area and applies to all unincorporated areas of the county that do not fall within the general plan boundaries of Dublin, Livermore, Pleasanton, and a portion of Hayward. In November 2000, Alameda County voters approved the Save Agriculture and Open Space Lands Initiative (Measure D; effective December 22, 2000 [Alameda County 2000]), which resulted in a number of changes to the East County Area Plan, including adjustment of the urban growth

boundary (UGB) to protect more land from development. Measure D is discussed further below under “Other Planning Influences.”

The East County Area Plan contains the following goals and policies that relate to the project (Alameda County Community Development Agency 2002):

- General Transportation
 - Goal: To create and maintain a balanced, multimodal transportation system that provides for the efficient and safe movement of people, goods, and services.
 - Policy 176: The County shall allow development and expansion of transportation facilities (e.g., streets and highways, public transit, bicycle and pedestrian paths, airports, etc.) in appropriate locations inside and outside the UGB consistent with the policies and Land Use Diagram of the East County Area Plan.
- Transportation Demand Management
 - Goal: To reduce East County traffic congestion.
 - Policy 183: The County shall seek to minimize traffic congestion levels throughout the East County street and highway system.

San Ramon General Plan. The San Ramon General Plan encompasses a 36.4-square-mile area, which includes the City limits, the sphere of influence, and UGB (City of San Ramon 2015). Although the General Plan does not explicitly discuss the implementation of HOV/express lanes on I-680 in the proposed project area, the General Plan does address plans for the installation of multiple HOV lane and gap closure projects, including gap closure projects along I-680 between North Main Street in Walnut Creek and Livorna Road in Alamo. The City of San Ramon General Plan contains the following goals and policies related to the proposed project:

- Policy 5.2-1-3: Participate in programs to mitigate regional traffic congestion.
- Policy 5.6-I-6: Work with other jurisdictions and agencies to coordinate the City’s TDM programs with regional plans that are aimed at reducing traffic congestion and improving air quality.
- Guiding Policy 5.6-G-2: Encourage trip reduction measures in an effort to reduce vehicle-miles-traveled, improve air quality, and reduce greenhouse gas (GHG) emissions.

Dublin General Plan. The City of Dublin General Plan planning area encompasses 22.84 square miles, of which 14.62 square miles are located within the city limits and urban limit line (City of Dublin 2016). The plan also includes the Eastern Extended Area Plan, encompassing 3,500 acres and expected to be built out by 2035; and the Western Extended Area Plan, encompassing 3,000 acres that are mostly outside of the urban line limit and reserved for rural residential and agricultural land uses. Circulation objectives in the General Plan refer to interchange improvements at I-680 but do not address freeway widening or HOV/express lane projects. The City of Dublin General Plan does not contain policies or goals specifically related to the proposed project.

Pleasanton General Plan. The Pleasanton General Plan covers a 75-square mile area and designates land uses for the entire planning area, including lands outside of its UGB that are within the jurisdictional authority of Alameda County (City of Pleasanton 2015). The Pleasanton General Plan includes a list of regional projects identified by the Tri-Valley Triangle Study that would provide the greatest benefit to the Tri-Valley for the least cost. The Tri-Valley Triangle Study included adding HOV lanes in the proposed project area. The following policies specifically address the project area:

- Policy 9: Work with other local jurisdictions and regional agencies such as ...the Alameda County Congestion Management agency and the Alameda County Transportation Improvement Authority⁴ to plan and coordinate transportation improvements.
- Program 9.1: Support State and regional efforts to implement the Tri-Valley Triangle Study Projects.

Happy Valley Specific Plan. The City of Pleasanton also prepared the Happy Valley Specific Plan in 1997 to address an 860-acre area to the west of I-680 along Happy Valley Road, in preparation for annexing the previously unincorporated area into the city (City of Pleasanton Department of Planning and Community Development 1998). The Happy Valley Specific Plan was created to guide the development of a municipal golf course and adjacent community. Circulation objectives in the specific plan refer to local roads only and not to I-680.

Habitat Conservation Plans

No natural community conservation plans are currently in effect for the project area (CDFW 2018a).

The Pacific Gas and Electric Company (PG&E) Bay Area Operations and Maintenance Habitat Conservation Plan was finalized in September 2017. The plan area includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. The plan covers ongoing PG&E operations and maintenance activities for 32 threatened and endangered plant and animal species (USFWS 2017). As the plan is specific to PG&E operation and maintenance activities, it does not contain policies or goals related to the proposed project.

The project area is directly adjacent to a bioregional habitat restoration program site established by the San Francisco Public Utilities Commission (SFPUC) as part of its Water System Improvement Program. The Sheep Camp Creek facility is bordered by SR 84 on the south, Little Valley Road and the Little Valley community on the east, I-680 and Koopman Road on the west, and open space on the north. In addition to providing habitat for special-status species, the facility allows for cattle grazing to reduce fuel loads and fire risk (SFPUC 2016a,b). SFPUC is currently preparing a habitat conservation plan for the Alameda Creek watershed, which would include the Sheep Camp Creek facility.

The project area is also within the study area for the East Alameda County Conservation Strategy, which was developed by local stakeholders including the Alameda County Community Development Agency; Alameda County Congestion Management Agency; Alameda County

⁴ The Alameda County Congestion Management Agency and the Alameda County Transportation Improvement Authority merged in 2010 to form the Alameda CTC.

Waste Management Authority; the Cities of Dublin, Livermore; and Pleasanton; East Bay Regional Parks District; and Zone 7 Water Agency. The strategy was developed to provide a blueprint for regional conservation of and mitigation for biological species in East Alameda County and to streamline the environmental permitting process for stakeholder-sponsored projects (East Alameda Conservation Strategy 2009; 2010).

The Southern Alameda Creek Watershed encompasses 175 square miles of rolling grassland and native oak woodlands in the East Bay, of which 36,000 acres or approximately one-third are owned by the SFPUC. The northern portion of the watershed includes the part of the project area where I-680 and SR 84 meet. In April 2001, the SFPUC adopted the Alameda Watershed Management Plan to guide the management of the SFPUC lands for watershed protection. The purpose of the Alameda Watershed Management Plan is to provide a policy framework for the SFPUC to make consistent decisions about the activities, practices, and procedures that are appropriate on SFPUC watershed lands. To aid the SFPUC in their decision-making, the plan provides a comprehensive set of goals, policies, and management actions, which integrate all watershed resources and reflect the unique qualities of the watersheds (SFPUC 2001). The following policy specifically addresses the project area.

- Policy WQ18: Minimize vehicle-related contaminants in runoff from road, parking lots, maintenance facilities, and other sources.

Other Regulatory and Planning Influences

Alameda County Measure D (2000). In November 2000, Alameda County voters approved the Save Agriculture and Open Space Lands Initiative (Measure D; effective December 22, 2000). Measure D enacted several changes to the Alameda County East County Area Plan (discussed further in “General Plans and Community Plans,” above) that included revising the UGB in the East County to reserve less land for urban growth and more land for agriculture and open space, requiring new housing to be located primarily within existing cities, modifying land use restrictions applicable to rural areas, and requiring a county-wide vote on changes to these policies.

In many areas, the UGB was set to coincide with existing or proposed city urban growth boundaries. Outside the UGB, the measure removed land from the former urban development use designation (which included industrial, major commercial and land use categories having a density of one or more residential units per acre) and converted it in most cases to 20-acre enhanced agricultural parcels upon demonstration of available water. Under the measure, new housing, including affordable housing obligations, must be within the UGB unless otherwise required by State law. Land outside the proposed UGB that was formerly designated as urban land use was redesignated as agricultural land (Alameda County 2000). Measure B also added provisions allowing Alameda County to permit areas designated as Large Parcel Agriculture to be used for agricultural processing facilities such as wineries, limited agricultural support services, and limited agricultural enhancing commercial uses. Changes to land uses that involve addition of residential units or new mining or quarry uses outside of the UGB must be approved by Alameda County voters.

State Scenic Highway Program. The Caltrans Scenic Highway Program is intended to protect and enhance the natural scenic beauty of California’s highways and adjacent corridors, through special conservation treatment. The program protects against encroachment of incompatible land

uses, mitigates and minimizes development activities along the corridor, prohibits billboards, regulates grading activity, and other activities causing visual degradation.

I-680 is listed as an Officially Designated State Scenic Highway between Mission Boulevard (SR 238) and the Contra Costa County line in Alameda County (PM R6.4 to R21.9) and from the Alameda County line to SR 24 in Contra Costa County (PM 0.0 to 14.4). Vegetation removal within these limits could lead to ineligibility in the future. Additionally, the freeway is designated as a Landscaped Freeway from PM 18.40 to 19.85 and R20.42 to R21.88 in Alameda County and from PM R0.0 to R2.76 in Contra Costa County. Removal of vegetation that results in 200-foot gaps in planting could result in declassification and the allowance of outdoor advertising. The entire project limits on I-680 are within the scenic corridor.

The State Scenic Highway Program has guidelines for identifying and designating scenic highways, which address regulation of land use and density of development, detailed land and site planning, control of outdoor advertising, attention to and control of earthmoving and landscaping, and attention to design and appearance of structures and equipment. Most guidelines apply to land uses outside of the State ROW. Because the proposed project would take place within the State ROW, none of guidelines are specific to the project area.

2.1.2.2 Environmental Consequences

Table 2.1.2-1 summarizes the consistency of the No Build and the Build Alternative with applicable plans and policies. The Happy Valley Specific Plan and PG&E Bay Area Operations and Maintenance Habitat Conservation Plan are not applicable to either the No Build or Build Alternatives. The Alameda Creek Watershed Habitat Conservation Plan is still in process and was not evaluated below.

Table 2.1.2-1: Consistency of Proposed Project with Applicable Plans and Policies

Plan/Policy	No Build Alternative	Build Alternative
Plan Bay Area 2040 (2017 RTP/SCS)	Not Consistent. This alternative would not contribute to the development of a Regional Express Lane Network. This alternative would not leverage revenues generated from pricing to improve the existing system's efficiency while providing alternatives to driving.	Consistent. This alternative would contribute to the development of a Regional Express Lane Network by closing the gap from SR 84 to Alcosta Boulevard between approved or constructed express lane segments. This alternative would also leverage revenues generated from pricing to improve the existing system's efficiency while providing alternatives to driving.
2016 Alameda Countywide Transportation Plan	Somewhat Consistent. This alternative would not wholly conflict with the goals for the county transportation system, but it also would not improve multimodality or safety in the project area or encourage revenue generation from HOV/express lanes.	Consistent. This alternative would support the goals for the county transportation system and encourage revenue generation from HOV/express lanes.
2014 Alameda County Transportation Expenditure Plan	Not Consistent. This alternative would not close gaps with HOV infrastructure as needed to relieve congestion.	Consistent. This alternative implement planned improvements and support safety, connectivity, and efficiency.
East County Area Plan (Alameda County General Plan) Policy 176: The County shall allow development and expansion of transportation facilities (e.g., streets and highways, public transit, bicycle and pedestrian paths, airports, etc.) in appropriate locations inside and outside the Urban Growth Boundary consistent with the policies and Land Use Diagram of the <i>East County Area Plan</i> .	Somewhat Consistent. This alternative would not develop or expand transportation facilities.	Consistent. This alternative would develop and expand the transportation facilities within the existing State ROW and would not conflict with the Land Use Diagram.
East County Area Plan (Alameda County General Plan) Policy 183: The County shall seek to minimize traffic congestion levels throughout the East County street and highway system.	Not Consistent. This alternative would not reduce traffic congestion levels throughout the East County.	Consistent. This alternative would increase the efficiency of the transportation system.
San Ramon General Plan Policy 5.2-1-3: Participate in programs to mitigate regional traffic congestion...	Not Consistent. This alternative would not mitigate regional traffic congestion.	Consistent. This alternative would promote HOV use through the I-680 corridor and increase the efficiency of the transportation system.
San Ramon General Plan Policy 5.6-1-6: Work with other jurisdictions and agencies to coordinate the City's TDM programs with regional plans that are aimed at reducing traffic congestion and improving air quality.	Not Consistent. This alternative would not reduce traffic congestion or produce air quality benefits.	Consistent. This alternative would increase the efficiency of the transportation system with a goal of reducing traffic congestion and improving regional air quality.
San Ramon General Plan Guiding Policy 5.6-G-2: Encourage trip reduction measures in an effort to reduce vehicle-miles-traveled, improve air quality, and reduce greenhouse gas emissions.	Not Consistent. This alternative would not encourage trip reduction measures.	Somewhat Consistent. Overall, this alternative would not reduce vehicle-miles-traveled; however, it would reduce traffic congestion and reduce criteria pollutant and GHG emissions compared to existing levels.

Plan/Policy	No Build Alternative	Build Alternative
Dublin General Plan	Consistent. This plan did not include goals supporting or prohibiting this alternative.	Consistent. This plan did not include goals supporting or prohibiting this alternative.
Pleasanton General Plan <u>Policy 9:</u> Work with other local jurisdictions and regional agencies such as ... the Alameda County Transportation Improvement Authority to plan and coordinate transportation improvements.	Not Consistent. This alternative would not involve transportation improvements.	Consistent. The transportation improvements associated with this alternative would be coordinated between the City of Pleasanton and Alameda CTC.
Pleasanton General Plan <u>Program 9.1:</u> Support State and regional efforts to implement the Tri-Valley Triangle Study Projects.	Not Consistent. This alternative would not implement the Tri-Valley Triangle Study Projects.	Consistent. This alternative would add HOV lanes on I-680 from SR 84 to Alcosta Boulevard as identified in the Tri-Valley Triangle Study.
East Alameda County Conservation Strategy	Consistent. This alternative would not conflict with the intent of the East Alameda County Conservation Strategy.	Consistent. This alternative would not conflict with the intent of the East Alameda County Conservation Strategy.
Alameda Watershed Management Plan <u>Policy WQ18:</u> Minimize vehicle-related contaminants in runoff from road, parking lots, maintenance facilities, and other sources.	Consistent. This alternative would not change vehicle-related contaminant runoff patterns.	Consistent. The Build Alternative would implement standard BMPs to avoid potential impacts to water quality. A SWPPP will also be implemented to minimize contaminants in runoff.
Alameda County Measure D (2000)	Consistent. This alternative would not affect development in Alameda County.	Consistent. The Build Alternative would not directly or indirectly intensify development outside of city UGBs beyond that already planned in the East County Area Plan, as revised based on Measure D. The project would expand infrastructure as necessary to create adequate service for the East County area. The proposed improvements would be consistent with the level of development envisioned in Measure D.
State Scenic Highway Program	Consistent. This alternative would not change the eligibility for this program.	Somewhat Consistent. This alternative would have a permanent impact on some vegetation along the freeway as well as construct new retaining walls and overhead signage, as described in Section 2.3.1.2, but vegetation removal, retaining walls, and overhead signage are unlikely to affect the designation as a State Scenic Highway with implementation of the measures listed in Section 2.1.8.4.
Landscaped Freeway Program	Consistent. This alternative would not change the eligibility for this program.	Somewhat Consistent. This alternative would have a permanent impact on some vegetation along the freeway, as described in Section 2.3.1.2, but vegetation removal is unlikely to affect participation in the Landscaped Freeway Program if replacement planting is provided close to areas of removal.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.1.2.3 Avoidance, Minimization, and/or Mitigation Measures

Measures to minimize visual impacts to an Officially Designated State Scenic Highway are provided in Section 2.1.8.4. No other avoidance, minimization, or mitigation is required.

2.1.3 Park and Recreational Facilities

2.1.3.1 Regulatory Setting

The Park Preservation Act (California Public Resources Code [PRC] Sections 5400-5409) prohibits local and state agencies from acquiring any property which is in use as a public park at the time of acquisition unless the acquiring agency pays sufficient compensation or land, or both, to enable the operator of the park to replace the park land and any park facilities on that land.

2.1.3.2 Affected Environment

The following discussion is from the *Community Impact Assessment* completed for the proposed project in January 2019 (AECOM 2019a).

Publicly owned parks and recreation areas within 0.25 mile of the project area are listed in Table 2.1.3-1. As the project would be limited to the existing I-680 ROW, a 0.25-mile study radius was chosen because it would reasonably capture impacts to parks and recreation areas from the proposed project. Table 2.1.3-1 includes descriptions of the location of each park or recreation area in relation to the project area.

Table 2.1.3-1: Publicly Owned Parks and Recreational Facilities

Jurisdiction	Name	Description	Location in Relation to Project Area
San Ramon	Boone Acres Park	City-owned park with volleyball court, picnic areas, horseshoe pits, track, and play area	Approximately 800 feet east of the project. Separated from I-680 by a sound wall and a residential neighborhood
Dublin	Kolb Park	City-owned park with barbecue grills, picnic areas, softball diamonds, tennis courts, and a play area	Approximately 1,200 feet east of the project. Separated from I-680 by a sound wall and a residential neighborhood
Dublin	Dublin Sports Grounds	City-owned park with barbecue grills, baseball diamonds, softball diamonds, soccer fields, picnic areas, and play areas	Approximately 850 feet east of the project. Separated from I-680 by interchange ramps, intervening vegetation, and the Alamo Canal
Dublin	Dublin Elementary School	Publicly accessible elementary school playground with basketball courts, soccer field, and playground equipment	Directly adjacent to the project. Separated from I-680 by a sound wall
Pleasanton	Centennial Trail	Public trail parallel to I-680 and between approximately Corte Monterey and Johnson Drive	Approximately 250 feet east of the project. Separated from I-680 by a utility maintenance road and the Alamo Canal
Pleasanton	Muirwood Community Park	City-owned park with fields, picnic areas, play areas, and a dog exercise area	Directly adjacent to the project. Separated from I-680 by thick vegetation and a sound wall
Pleasanton	Val Vista Park	City-owned park with a skatepark, a play area, picnic areas, soccer fields, and an in-line hockey rink	Approximately 900 feet east of the project. Separated from I-680 by a wastewater treatment facility

Jurisdiction	Name	Description	Location in Relation to Project Area
Pleasanton	Oak Hill Park	City-owned park with play areas and picnic areas	Approximately 1,000 feet west of the project. Separated from I-680 by a sound wall and a residential neighborhood
Pleasanton	Del Prado Park	City-owned park with a basketball court and playgrounds	Approximately 730 feet east of the project. Separated from I-680 by thick vegetation and a residential neighborhood
Pleasanton	Meadowlark Park	City-owned park with barbecue pits, basketball courts, picnic areas, play areas, and volleyball courts	Directly adjacent to the project. Separated from I-680 by a sound wall
Pleasanton	Fawn Hills Park	City-owned park with barbecue pits, basketball courts, picnic area, and a play area	Approximately 275 feet west of the project. Separated from I-680 by a vegetated berm
Alameda County	Pleasanton Ridge Regional Park	County-owned parkland with trails for hiking, biking, horseback riding, plus cattle grazing	Distance varies. Separated from I-680 by a vegetated berm, Pleasanton Sunol Road, and Foothill Road

Sources: City of San Ramon 2018; City of Dublin 2018a,b; Dublin Elementary School 2018; P-Town Life 2018; East Bay Regional Park District 2018

With the exception of Centennial Trail, the facilities listed in Table 2.1.3-1 are protected by the Park Preservation Act (California PRC Sections 5400-5409) as well as Section 4(f) of the Department of Transportation Act of 1966 (49 United States Code [USC] 303), which protect park land from being converted to nonpark land. Centennial Trail is primarily used for transportation, and therefore the requirements of Section 4(f) do not apply.

In addition, the Dublin Sports Grounds complex is protected by Section 6(f) of the Land and Water Conservation Fund Act, which prohibits the conversion of property acquired or developed under the act to a nonrecreational purpose without the approval of the Department of the Interior's National Park Service.

2.1.3.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect parks or recreation facilities near the project area.

Build Alternative

The project would not require the permanent use of any publicly owned park or recreational facility, as the project would be within the existing State ROW. If visible following project construction, the HOV/express lanes, signage, and lighting would be visually consistent with the existing freeway infrastructure and would not affect park or trail use.

Construction activities would not require TCEs from, or closure, alteration, or other use of, the parks or trail listed in Table 2.1.3-1. Recreationists on the Centennial Trail could be exposed to short-term, temporary noise and views of project construction, depending on the location and nature of construction activities (described further in Section 2.2.6.3 under "Short-Term Noise Changes" and Section 2.1.8.3 under "Temporary Construction Visual Impacts"). The trail is

primarily used for transportation, there are no benches or other fixed amenities on the trail segment along I-680 that would encourage trail users to linger, and the trail is currently exposed to the sights and sounds of vehicular traffic on I-680 to the west. As such, trail users are not anticipated to remain in any one location of the trail more than momentarily as they pass by. Given the existing setting and the brief duration of recreationists' potential exposure to noise and views associated with construction, project construction is not expected to affect use of the Centennial Trail.

The other parks and recreation facilities adjacent to I-680 are separated by sound walls or vegetated berms, which would provide shielding from views, sounds, and smells of construction activities. Project construction is not expected to affect the use of any park.

With the exception of Centennial Trail, the parks and recreational facilities within the project vicinity are protected by Section 4(f) of the Department of Transportation Act of 1966. However, this project will not "use" those facilities as defined by Section 4(f). Please see Appendix A under the heading "Resources Evaluated Relative to the Requirements of Section 4(f)" for additional details.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.1.3.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

2.1.4 Growth

2.1.4.1 Regulatory Setting

The Council on Environmental Quality regulations, which established the steps necessary to comply with the NEPA of 1969, require evaluation of the potential environmental effects of all proposed federal activities and programs. This provision includes a requirement to examine indirect effects, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The Council on Environmental Quality regulations (40 CFR1508.8) refer to these consequences as indirect impacts. Indirect impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

CEQA also requires the analysis of a project's potential to induce growth. The CEQA guidelines (Section 15126.2[d]) require that environmental documents "...discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment..."

2.1.4.2 Affected Environment

The following discussion is from the *Community Impact Assessment* completed for the proposed project in January 2019 (AECOM 2019a).

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.

The proposed project is located in the Tri-Valley Region, which includes the cities of Danville, Dublin, Livermore, Pleasanton, and San Ramon. The Tri-Valley region has been home to a growing high-tech economy over the last 40 years that includes research and development infrastructure as well as an entrepreneurial environment. The Tri-Valley is growing at a faster rate than the nine-county Bay Area as a whole in terms of both population and employment. Over the last two decades, the Tri-Valley has experienced an influx of people and jobs. Between 2000 and 2012, the Tri-Valley's total population expanded by 20 percent, more than double the rate for the greater Bay Area. Over that same period, the Tri-Valley added approximately 40,000 jobs – increasing employment by 21 percent – while job growth in the Bay Area has been 3 percent (Bay Area Council Economic Institute 2015).

Growth in the Tri-Valley region is not limited to the last two decades. The growth rate in the last 40 years is evident from the population change in the five Tri-Valley cities compared with Alameda County (Table 2.1.4-1). Between 1970 and 2010, the growth rate in the Tri-Valley region was over seven times that of Alameda County; when combined, cities in the Tri-Valley experienced a 297 percent increase in population, while Alameda County only had a 41 percent increase.

Table 2.1.4-1: Population Change 1970-2010, Tri-Valley Region and Alameda County

Jurisdiction	1970	2010	Percent change
Danville	4,770	42,039	781
Dublin	13,641	46,036	238
Livermore	37,703	80,968	115
Pleasanton	18,328	70,285	284
San Ramon	4,084	72,148	1,667
Total Tri-Valley Cities	78,526	311,476	297
Alameda County	1,071,446	1,510,271	41

Note: Danville, Dublin, and San Ramon were not incorporated until the early 1980s.

Sources: MTC-ABAG Library 2017 (for 1970); Danville's 1970 population estimated from Wikipedia 2017; U.S. Census Bureau 2010 (for 2010).

Change in employment has also been occurring longer than the last two decades. Between 1994 and 2011 over 75,000 jobs were added in the Tri-Valley region (Bay Area Council Economic Institute 2015). The sectors experiencing the highest increase in employment are related to software, telecommunications, publishing, and data processing.

Growth is expected to continue into the future. *Plan Bay Area* projects that Alameda County's population will increase by 32 percent from 2010 to 2040 (ABAG and MTC 2017b). The population growth is anticipated to be accompanied by a 36 percent increase in employment and 25 percent increase in housing units. Growth in employment and housing units is envisioned primarily within cities and inside urban growth boundaries/city line limits to match population growth with economic growth and multimodal transportation options. *Plan Bay Area* designates PDAs in support of focusing future growth in areas that have proximity to transit, jobs, shopping, and other services. Promoting compact development within PDAs is intended to take development pressure off the region's open space and agricultural lands (ABAG and MTC 2012).

In unincorporated East Alameda County, including Sunol, less growth is expected than in Alameda County as a whole due to land use requirements set forth in the East County Area Plan. According to plan projections, housing units in unincorporated lands were anticipated to increase from a total of 300 in 1990 to 470 at plan buildout, and jobs were anticipated to remain at a total of 100 in both 1990 and at plan buildout (Alameda County Community Development Agency 2002).

2.1.4.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not increase the capacity of I-680 in the project area. The No Build Alternative would not influence growth patterns in the project area.

Build Alternative

The project would add capacity to I-680 from SR 84 to Alcosta Boulevard by constructing an HOV/express lane along the median in each direction, to connect with existing or in-construction HOV/express lanes to the north and south of the proposed project. This additional capacity is anticipated to alleviate congestion and improve travel time reliability. As travel times improve,

some vehicles are anticipated to shift to I-680 from local roadways that are currently used to avoid congestion on I-680, such as the San Ramon Road/Foothill Road, Pleasanton Sunol Road, and Dougherty Road/Hopyard Road corridors. The capacity increase on I-680 is not expected to cause a substantial increase in new vehicle trips on a regional level because the project would not increase the capacity of adjacent travel gateways including I-680 south of SR 84 and over the Sunol Grade, SR 84 west of I-680, and I-680 north of Bollinger Canyon Road (Fehr & Peers 2019).

The project area is served by several transit routes, as described further in Section 2.1.7.1. Shuttles and buses operated by private companies also use I-680 in the project area. By providing HOV lanes in both directions of I-680, the proposed project would provide reliable travel times for transit routes that use I-680 in the project area. In addition, as set forth in California Streets and Highways Code Section 149.5, revenue collected from the proposed HOV/express lanes will support transportation improvements and transit projects within the corridor.

The additional capacity for HOVs and toll-paying SOVs and the travel time improvements from the project could make the communities along the project corridor more attractive locations for new housing and businesses, thereby changing the location or rate of growth. However, development and intensification of land uses are restricted by the land use plans and urban growth boundaries/city limit lines described in Section 2.1.2. The proposed project would not alter existing land use plans for any jurisdiction along the project corridor, provide new access to previously undeveloped land, or change the type or amount of growth expected. Therefore, the project would accommodate planned growth but would not affect land use decisions in a way that would encourage growth beyond reasonably foreseeable levels. The proposed project is not expected to change the location, rate, type, or amount of growth planned for this region.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

2.1.5 Environmental Justice

The following discussion is from the *Community Impact Assessment* completed for the proposed project in January 2019 (AECOM 2019a).

2.1.5.1 Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President William J. Clinton on February 11, 1994. This EO directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2018, this was \$25,750 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964, and related statutes, have also been included in this project. Caltrans' commitment to upholding the mandates of Title VI is demonstrated by its Title VI Policy Statement, signed by the Director, which can be found in Appendix B of this document.

2.1.5.2 Affected Environment

In order to determine the presence of environmental justice communities of concern that have the potential to be affected by the project, higher resolution data was used. The environmental justice analysis includes the Census Block Groups that border the project area. Block groups are divisions of Census tracts that are delineated by local or regional organizations and usually consist of a cluster of several blocks. For the environmental justice analysis, the study area block groups are compared to the county each block group is in (i.e., reference area). Data for the analysis was derived from the US Census Bureau 2012-2016 American Community Survey 5-Year Estimates (Census 2016).

Caltrans identifies a community as an environmental justice community of concern if it meets one or both of the following criteria:

- The minority population exceeds 50 percent or is meaningfully greater (e.g., more than 10 percentage points) than the minority population percentage in the general population or other appropriate unit of geographic analysis (e.g., the counties overlapping the study area).
- The low-income population comprises more than 25 percent of the Census block group or tract.

There are 27 block groups that border the project area. Two block groups meet at least one of the criteria of an environmental justice community of concern. The results are shown in Table 2.1.5-1.

Table 2.1.5-1: Summary of Race, Ethnicity, and Poverty Status in the Study Area and Reference Areas

Geography	Black	Native American	Asian	Native Hawaiian or Other Pacific Islander	Minority*	Hispanic	Below Poverty Level
California	5.9%	0.7%	13.9%	0.4%	38.7%	38.6%	15.8%
<i>Alameda County</i>	<i>11.3%</i>	<i>0.6%</i>	<i>28.2%</i>	<i>0.9%</i>	<i>56.1%</i>	<i>22.6%</i>	<i>12.0%</i>
Tract 4503, BG 1	1.3%	2.6%	30.2%	0.0%	39.7%	12.3%	5.4%
Tract 4503, BG 2	8.5%	0.2%	12.4%	0.0%	30.6%	16.0%	6.0%
Tract 4504, BG 1	2.3%	1.6%	8.1%	0.0%	13.5%	4.0%	2.2%
Tract 4504, BG 2	1.6%	0.0%	18.0%	0.1%	23.8%	11.1%	8.4%
Tract 4504, BG 3	0.2%	0.0%	40.5%	0.0%	44.3%	10.2%	7.2%
Tract 4505.01, BG 2	6.4%	0.5%	23.0%	0.0%	29.9%	12.9%	4.2%
Tract 4505.02, BG 1	2.2%	0.2%	10.7%	0.0%	13.0%	12.6%	0.9%
Tract 4505.02, BG 2	1.9%	0.2%	32.2%	0.0%	34.4%	4.4%	2.6%
Tract 4506.01, BG 1	0.5%	0.0%	6.7%	0.7%	12.8%	0.0%	11.5%
Tract 4506.01, BG 2	4.2%	0.0%	33.0%	0.0%	41.6%	6.7%	5.1%
Tract 4506.02, BG1	5.6%	0.0%	26.5%	4.9%	53.6%	25.7%	5.6%
Tract 4506.02, BG 2	1.4%	0.0%	36.4%	0.0%	43.1%	3.7%	6.8%
Tract 4506.02, BG 3	0.0%	0.6%	23.4%	0.9%	28.8%	5.2%	1.1%
Tract 4506.02, BG 4	0.2%	0.0%	23.7%	0.0%	28.4%	14.7%	0.6%
Tract 4506.02, BG 5	4.0%	0.0%	31.1%	0.0%	37.5%	8.5%	8.5%
Tract 4506.03, BG 2	5.9%	0.0%	35.6%	0.0%	43.3%	0.0%	0.0%
Tract 4506.03, BG 3	0.1%	0.5%	24.2%	0.0%	35.7%	3.5%	0.0%
Tract 4506.03, BG 4	0.0%	0.0%	27.7%	0.0%	32.2%	12.1%	1.5%
Tract 4506.06, BG 1	0.5%	0.2%	29.9%	0.0%	45.5%	7.3%	0.3%
Tract 4506.06, BG 2	0.7%	0.0%	27.4%	0.0%	33.5%	3.9%	1.3%
Tract 4506.07, BG 1	6.3%	0.0%	33.6%	0.0%	39.9%	10.6%	5.2%
Tract 4507.01, BG 2	2.0%	0.0%	10.3%	0.0%	20.2%	5.9%	0.0%
Tract 4507.01, BG 3	1.1%	0.3%	23.3%	0.0%	30.6%	10.9%	4.2%
<i>Contra Costa County</i>	<i>8.8%</i>	<i>0.5%</i>	<i>15.5%</i>	<i>0.5%</i>	<i>40.3%</i>	<i>25.1%</i>	<i>10.2%</i>
Tract 3451.01, BG 1	15.2%	0.0%	14.5%	0.0%	32.7%	8.6%	14.0%
Tract 3451.01, BG 2	2.3%	0.0%	11.1%	0.9%	15.9%	16.9%	2.2%
Tract 3451.01, BG 4	0.5%	0.8%	46.3%	0.0%	53.8%	13.1%	5.9%
Tract 3451.15, BG 1	0.4%	0.9%	38.2%	0.0%	44.4%	5.0%	1.9%

Notes: *Minority is the sum of all U.S. Census reported groups except White.

BG – Block Group, *Italics* – Reference population, **Bold** – Meets at least one of the criteria of an environmental justice community of concern

Source: Census 2016

Express lanes currently exist or are planned on many of the Bay Area's major freeways, including United States Highway 101, I-80, SR 85, I-580, I-680, and I-880. Together, these

projects would create a network of express lanes with the potential to encourage carpooling while using extra capacity in the HOV lanes to carry SOVs during the commute periods. Use of both HOV lanes and express lanes is optional, and they do not alter the allowable use of the general-purpose lanes, which would continue to remain open to any driver, regardless of vehicle type or occupancy.

A FasTrak Flex toll tag transponder will be required for SOVs to use the express lanes. Toll tags can be obtained online, by mail, or from retail outlets such as Walgreens and Costco (FasTrak 2019). With the number of options available, persons of all income levels would have similar access to a FasTrak account. A \$20 security deposit is collected for each toll tag when paying with cash or check.

2.1.5.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect an environmental justice community of concern.

Build Alternative

The two block groups that meet the criteria of an environmental justice community of concern did so due to their large proportion of minority residents. The environmental justice block group in Alameda County is located in the southwest corner of the I-580/I-680 interchange, and extends to Foothill Road to the west and approximately Stoneridge Drive to the south. The environmental justice block group in Contra Costa County is located northeast of the I-680/Alcosta Boulevard interchange and is bordered by Pine Valley Road to the north, Broadmoor Drive to the east, Interlachen Avenue to the south, and Davona Drive to the east.

Proposed work in these areas would be limited to pavement widening in the median, installation of electronic tolling equipment, replacement of the concrete median barrier, and the addition of signs and lighting. No bridge widening, retaining walls, or replacement sound walls are proposed for these locations. As a result, the environmental justice communities would experience fewer construction-related effects than other communities along the project corridor.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

Toll Lanes

California transportation authorities have studied the socioeconomic effect of charging tolls on different driver income groups. Express lanes have been in use for several years around the United States; and more than ten years of data on drivers' usage are available in California for express lanes in Orange and San Diego counties, where FasTrak is also used. The data indicate that both high- and low-income drivers pay to use express lanes during periods of traffic congestion. A study by Cal Poly San Luis Obispo of the SR 91 express lanes in Orange County found that roughly one-quarter of the motorists who elect to use the toll lanes at any given time are in the high-income bracket, but the majority are low- and middle-income motorists (FHWA 2013). In San Diego, 80 percent of the lowest-income motorists using the I-15 corridor agreed that people who drive alone should be able to use the I-15 express lanes for a fee (FHWA 2013). In focus groups conducted in the South San Francisco Bay Area, respondents from all income

levels reported they would use express lanes, indicating a high level of acceptance of tolling on highway facilities (Santa Clara Valley Transportation Authority 2008).

Factors other than income alone appear to influence drivers' decisions to use express lanes. On SR 91, an 18-mile express lane in Orange County, for example, most drivers choose the express lanes infrequently but strategically, when they stand to benefit most (Weinstein and Sciara 2004). When toll prices in the SR 91 express lanes increased, people in the lowest-income group did not reduce their travel, but people of moderate income did. This suggests that people with lower incomes have less travel time flexibility than higher-income drivers and/or that low-income drivers place a very high value on reliable travel times (FHWA 2017). Reliable travel times may particularly benefit low-income drivers in situations where being late due to traffic congestion has high economic or convenience costs.

Although HOV/express lane tolls would represent a slightly greater economic burden to low-income drivers than to middle- and high-income drivers, the burden is not disproportionate because the project would maintain the existing number of general-purpose lanes, and HOV/express lane use is voluntary. Drivers may either choose to pay a toll when being late is costly or inconvenient, or continue to use the general-purpose lanes. Drivers are not denied a mobility option they previously had; rather, the option of paying a toll to obtain travel time savings would be available to drivers of all income groups. Unlike sales taxes for transportation measures, HOV/express lane tolls do not affect nonusers and nondrivers.

The proposed project would have other potential benefits to drivers of all income levels. By closing the existing HOV/express lane gap, the project would incrementally improve traffic in the general-purpose lanes, directly benefiting drivers in the general-purpose lanes. Tolls collected from the HOV/express lanes would be used to cover direct expenses related to operation, maintenance, construction, and administration of the lanes; the remaining toll revenue would be used for other transportation and transit improvements in the project corridor (California Streets and Highways Code Section 149.5). Therefore, the project would provide direct benefits to both drivers and transit customers whose trips include I-680. Congestion relief from the project would also result in slightly lower pollutant emissions from vehicle idling. Indirect benefits could include additional economic opportunities for low-income drivers, who could use the HOV/express lanes to ensure a reliable commute.

2.1.5.4 Avoidance, Minimization, and/or Mitigation Measures

Based on the above discussion and analysis, the project will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

2.1.6 Utilities/Emergency Services

The following discussion is from the *Community Impact Assessment* completed for the proposed project in January 2019 (AECOM 2019a).

2.1.6.1 Affected Environment

Power, gas, telecommunication (fiber optic), and water utilities are located within the project vicinity. PG&E provides gas and electricity service, American Telephone & Telegraph Company and Verizon provide telecommunication service through the project area, and SFPUC, Dublin-San Ramon Services District (DSRSD), and Alameda County Water District manage water utilities located within the project limits.

Police protection and traffic enforcement services in the study area are provided by the Pleasanton Police Department, San Ramon Police Department, and Alameda County Sheriff's Department. CHP has jurisdiction over the I-680 corridor for matters involving traffic violations and emergency services. Fire protection services in the study area are provided by the Livermore-Pleasanton Fire Department, San Ramon Valley Fire Protection District, and the Alameda County Fire Department.

2.1.6.2 Environmental Consequences

No Build Alternative

As the No Build Alternative would not result in changes to I-680, it would not require utility relocations or construction activities that could interfere with the provision of emergency services.

Build Alternative

The Build Alternative would require relocation of some PG&E overhead electrical and underground gas and electrical lines, Sprint fiber optic conduit, and Comcast cable, as shown in Table 2.1.6-1. The relocations may result in short-term, temporary interruptions of service. Final verifications of utilities would be performed during the project's detailed design phase, and any needed relocations would be coordinated with the affected utility owner. No impacts to water service are anticipated.

Table 2.1.6-1: Preliminary Utility Relocations

Owner	Utility Relocation	Location (Post Mile on ALA-680)	Relocation Quantity (linear feet)
PG&E	12kV Overhead Distribution	R15.275	400
Sprint	Fiber Optic conduit	R20.406	250
PG&E	4" Gas Distribution	R20.406	250
PG&E	12kV 2-6" & 4" conduits – Electric Distribution	R20.406	250
Comcast	Cable TV	R20.406	250

Temporary lane closures on I-680 will be required to construct the project, which could affect emergency service providers. During final design, a TMP will be developed for the project to minimize construction-related delays and inconvenience to project area residents and the traveling public. The TMP will include input from the jurisdictions along the project corridor and emergency service providers; notification to emergency service providers and the public of lane closures and detours; coordination with CHP and local law enforcement on contingency plans; and using portable Changeable Message Signs, CHP Construction Zone Enhanced Enforcement Program, and Freeway Service Patrol where possible to minimize delays. Therefore, no emergency services would be temporarily affected by construction of the project.

Law enforcement, fire, and/or emergency services would be maintained during project construction and operation of the lanes. The project is not expected to result in decreased response times.

The Build Alternative would not result in long-term effects on utilities or emergency services. No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.1.6.3 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

2.1.7 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.7.1 Affected Environment

The information from this section is based on the *Traffic Operations Analysis Report* (Fehr and Peers 2019) completed in July 2019.

Roadway Network

As described in Section 1.2, I-680 is a major north-south transportation corridor connecting Silicon Valley and the surrounding South Bay with the Tri-Valley area and eastern Contra Costa County. In the project area, I-680 provides a connection to I-580 in Pleasanton. Within the project limits, I-680 contains three general-purpose lanes (with no vehicle type or occupancy restrictions) in each direction, except north of Dublin Boulevard, where I-680 has four general-purpose lanes in the northbound direction.

Southbound I-680 has an HOV/express lane from south of the SR 84 interchange to SR 237 in Milpitas and from north of Alcosta Boulevard to Rudgear Road in Walnut Creek. Northbound I-680 has an HOV/express lane from north of Alcosta Boulevard to Livorna Road in Alamo. A northbound HOV/express lane is under construction from SR 262 (Mission Boulevard) to north of the SR 84 interchange. Figure 1.3-1 in Section 1.3.2.2 shows the other HOV/express lanes in the project vicinity.

I-680 also has auxiliary lanes between the Stoneridge Drive and I-580 interchanges in Pleasanton.

I-680 is also a designated truck route and part of the Surface Transportation Assistance Act National Network, a network of highways for use by large trucks that includes almost all of the Interstate Highway System.

Bicycle and Pedestrian Facilities

There are no designated bicycle or pedestrian facilities on I-680 in the project limits. At the I-680/SR 84/Calaveras Road interchange, bicyclists are currently permitted to enter northbound I-680 at Calaveras Road and exit at northbound SR 84 (Vallecitos Road; signed as eastbound in this area).

Transit

Public transit routes and privately operated shuttles use I-680 in the project area. The primary transit service providers in the study area are the Livermore-Amador Valley Transit Authority (Wheels) and the Central Contra Costa Transit Authority (County Connection). Routes in the study area are described below.

- Wheels operates fixed-route bus service throughout Livermore, Dublin, and Pleasanton. Three routes use I-680 in the study area: Routes 70X, 53, and 54. Route 70X provides express commute bus service between Pleasant Hill/Walnut Creek and Dublin via the existing I-680 HOV/express lane to the north of the project area. Routes 53 and 54 provide service between the Pleasanton Altamont Corridor Express (ACE) station and the West and East Dublin/Pleasanton BART stations via the I-680 corridor between I-580 and Bernal Avenue.

- County Connection provides bus service in Dublin and San Ramon. Route 92X provides express commute bus service between Walnut Creek and the Pleasanton ACE station. Route 97X provides express commute bus service between the San Ramon Transit Center and East Dublin/Pleasanton BART. Both routes use the existing I-680 HOV/express lane to the north of the project area.

In addition, ACE provides peak-direction commuter rail service between San Joaquin County and Santa Clara County via downtown Livermore and downtown Pleasanton, with the route's eastern terminus in Stockton (Cabral) and the western terminus in San Jose (Diridon).

Traffic Operations Analysis Study Area and Methods

The traffic study area was developed in consultation with Caltrans staff. The purpose of the study area is to capture the local and regional traffic effects of the proposed project. The study area includes northbound I-680 between the Washington Boulevard interchange in Fremont and the Bollinger Canyon Road interchange in San Ramon, and southbound I-680 between the Bollinger Canyon Road interchange in San Ramon and the Sheridan Road interchange in unincorporated Alameda County (see Figure 2.1.7-1). The geographic area considered in the traffic analysis extends beyond the project limits to capture the effects of the proposed project on the surrounding transportation system and the effects of traffic in the surrounding area on the proposed project.

The traffic study analyzed the following scenarios:

- Existing conditions, which represent 2018, the year when the traffic study began;
- 2025, which represents the project's opening year, for the No Project and Plus-Project scenarios; and
- 2045, which represents the design year (20 years after the opening year), for the No Project and Plus-Project scenarios.⁵

The traffic forecasting procedure for 2025 and 2045 volumes used the Alameda CTC Travel Demand Forecasting Model, a regional travel demand model that covers the entire Bay Area, with a higher level of geographic detail within Alameda County. The model reflects demographic inputs and regional land use projections consistent with *Plan Bay Area*, as well as roadway network improvements in the cities around the study area included in *Plan Bay Area* (ABAG and MTC 2017a). The land use assumptions include *Plan Bay Area* projections for planned developments throughout the Bay Area through 2040.

The forecast assumed completion of the following roadway network improvements in the study area in 2025 and 2045 for both the No Project and Plus-Project conditions.

⁵ The Traffic Operations Analysis Report qualitatively analyzed traffic conditions in the event that, due to funding and other constraints, the project opening year is 2026 instead of 2025, and subsequently the project design year is 2046 instead of 2045. See Section 2.1.7.2 under "Opening Year (2025)" and "Design Year (2045)," below.

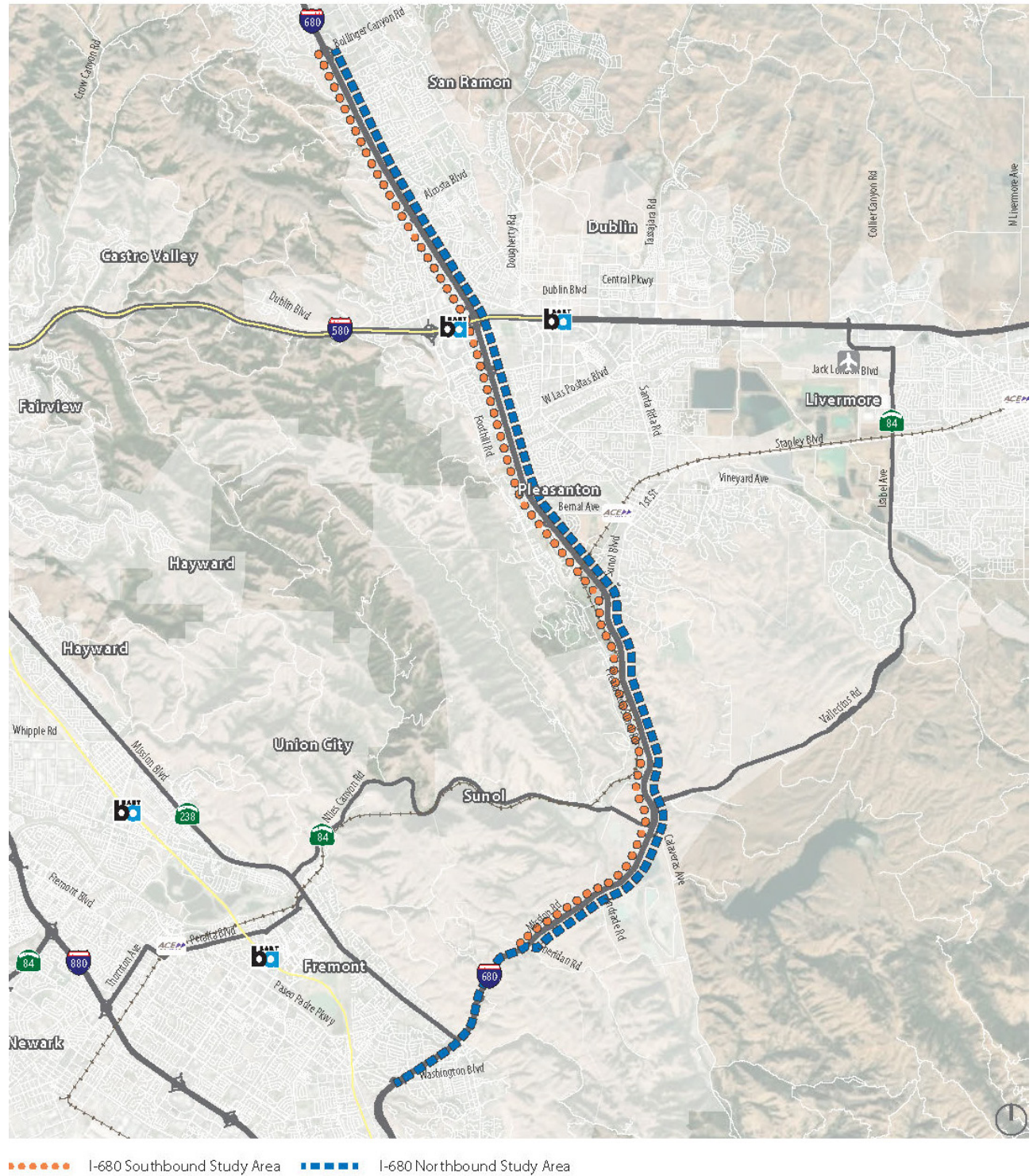


Figure 2.1.7-1: Traffic Study Area Map

- I-680 Northbound HOV/Express Lane Project Phase 1: from SR 262 (Mission Boulevard) to just north of the northbound SR 84 off-ramp (continuous access; currently under construction)
- Existing Alameda/Santa Clara County I-680 Southbound HOV/Express Lane conversion to continuous access (currently under construction)
- SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project, including:
 - SR 84 corridor widened to four lanes from Ruby Hill Drive to I-680
 - Consolidated access point (signalized) at SR 84/Little Valley Road/Vallecitos Atomic Laboratory Road
 - I-680/SR 84 interchange improvements (HOV metered bypass lane for southbound SR 84 connector to southbound I-680, northbound I-680 to northbound SR 84 connector gore point widened to a two-lane exit [one exit only lane plus one optional exit lane], and modified Calaveras Road on-ramp to northbound I-680 and northbound SR 84)
 - Southbound I-680 express lane extended northward to approximately 0.8 mile north of Koopman Road
- Activate northbound I-680 PM peak period ramp meters from the Vargas Road on-ramp to the Stoneridge Drive diagonal on-ramp (inclusive of these ramps); meters active from 2:00 PM to 7:00 PM (under construction)

Freeway operations were analyzed using VISSIM microsimulation analysis software, based on the procedures and methodologies outlined in the 2010 Highway Capacity Manual (Transportation Research Board 2011). The AM and PM peak operational models were calibrated and validated to observed traffic counts, travel times, bottleneck locations, and queues.

The Traffic Operations Analysis Report also analyzed system-wide performance measures, called measures of effectiveness, to provide an understanding of overall traffic operations and how they vary between the No Project and Plus-Project scenarios.

- Volume Served – A measure of the vehicles that can be served by the study area roadway system during the analysis period.
- VMT – A measure of the total vehicle throughput of the study area, taking into consideration the actual volume served versus the demand and the trip lengths of those vehicles.
- Vehicle Hours of Delay (VHD) – The total delay incurred by vehicles during the peak period due to traffic congestion.
- Average Travel Time – A measure of the time taken by all vehicles (on average) to travel through the network (i.e., between two discrete points during the study period). The travel time calculation considers the average delay, vehicle queues, and friction caused by merging vehicles.

- **Average Travel Speed** – A measure of vehicle speeds in the network that travel between two discrete points during the study period. This measure depends on both the posted speed for a given link and the level of congestion.
- **Maximum Individual Delay** – A measure of the maximum delay that a motorist would experience through the corridor during the most congested period (for this analysis, the most congested 30-minute period in the peak period). This measure is calculated by subtracting the average travel time through the corridor under free-flow conditions from the travel time during the most congested period.

The analysis results also include LOS, a measure of the quality of traffic operating conditions varying from LOS A (indicating free-flow traffic conditions with little or no delay) to LOS F (representing over-saturated conditions when traffic flows exceed capacity, resulting in long queues and delays). LOS represents the perspective of drivers and is an indication of the comfort and convenience associated with driving. The LOS standard adopted by the Alameda CTC for the Congestion Management Program and the Metropolitan Transportation System roadway segments (e.g., I-580, I-680, SR 84) is LOS E.

For the purposes of this project, the AM peak period is 5:00 AM to 1:00 PM, and the PM peak period is 2:00 PM to 9:00 PM. Traffic volumes and LOS were identified for 30-minute intervals (7:30 AM to 8:00 AM and 5:30 PM to 6:00 PM) because 1-hour intervals would not as accurately reflect the growth and change in congestion over time in the study area.

Existing Conditions

Bottlenecks

Southbound AM. During the AM peak period, high volumes of vehicles entering southbound I-680 from western Pleasanton create a bottleneck between the Sunol Boulevard on-ramp and the Koopman Road off-ramp from approximately 6:00 AM to 10:00 AM that extends to the westbound I-580 off-ramp.

Southbound PM. During the PM peak period, a bottleneck forms on southbound I-680 between the Bollinger Canyon Road diagonal on-ramp and Alcosta Boulevard off-ramp between 4:30 PM and 6:30 PM, causing backups that extend outside of the study area. Another bottleneck forms on southbound I-680 between the Stoneridge Drive diagonal on-ramp and Bernal Avenue off-ramp between 5:30 PM and 6:00 PM; the resulting backups extend to the Stoneridge Drive off-ramp.

Northbound AM. Northbound I-680 is uncongested during the AM peak period.

Northbound PM. In the northbound direction, a bottleneck forms between the Washington Boulevard on-ramp and the Mission Boulevard (SR 238) off-ramp from 2:30 PM to 8:00 PM, causing backups that extend outside of the study area. That bottleneck, together with another to the north between the Andrade Road on-ramp and the Calaveras Road (SR 84) off-ramp during generally the same period, controls northbound PM peak period traffic within the study area.

Levels of Service

For the AM peak, southbound I-680 operates at LOS F from the Dublin Boulevard on-ramp merge to the Sunol Boulevard on-ramp merge. Downstream of the Sunol Boulevard on-ramp merge section, the corridor operates at LOS E in the bottleneck section between the Sunol

Boulevard on-ramp and the Koopman Road off-ramp. From Koopman Road to the Paloma Way on-ramp, southbound I-680 generally operates at LOS E, which indicates that this section is operating near capacity. Downstream of Paloma Way (SR 84), southbound I-680 operates at LOS D or better.

In the AM peak, northbound I-680 generally operates at LOS D or better, indicating free-flow conditions. Segments of northbound I-680 near the Alcosta Boulevard on-ramp were estimated to operate at LOS E.

In the PM peak, northbound I-680 within the project limits operates at LOS F between the Stoneridge Drive off-ramp and the Stoneridge Drive loop on-ramp. The weave segment between the Stoneridge Drive diagonal on-ramp and the eastbound I-580 off-ramp operates at LOS E as it is a bottleneck.

Measures of Effectiveness

Table 2.1.7-1 summarizes the existing conditions on I-680. For the AM peak period, speeds along southbound I-680 average near 52 mph but the maximum individual delay of 17.0 minutes (versus an average travel time of 19.7 minutes) indicates severe congestion due to the Sunol Boulevard bottleneck. During the PM peak period, southbound I-680 speeds are generally near free-flow conditions (64.6 mph), as the travel time calculation limits do not include the queue for the Bollinger Canyon Road to Alcosta Boulevard bottleneck. However, the effects of queuing for the Stoneridge Drive to Bernal Avenue bottleneck are evident in the maximum individual delay of 2.7 minutes.

Table 2.1.7-1: Existing Conditions (2018) Network Measures of Effectiveness

Measure	AM Peak Period ¹	PM Peak Period ²
All Segments-Locations³		
Volume Served	168,900	163,700
VMT	1,789,900	1,686,200
VHD in hours	5,550	11,720
Travel Through the Study Corridor (Southbound I-680)⁴		
Average Travel Time (minutes)	19.7	14.4
Average Travel Speed (mph)	52.0	64.6
Maximum Individual Vehicle Delay (minutes)	17.0	2.7
Travel Through the Study Corridor (Northbound I-680)⁵		
Average Travel Time (minutes)	16.1	23.4
Average Travel Speed (mph)	65.3	46.9
Maximum Individual Vehicle Delay (minutes)	1.3	11.3

Notes: Delay is calculated relative to 65 mph on freeways.

1. AM peak period represents 8 hours from 5:00 AM to 1:00 PM

2. PM peak period represents 7 hours from 2:00 PM to 9:00 PM

3. Combined statistics of all origin-destination pairs (i.e., mainlines, entry and exit points, all on- and off-ramps, and intersections in the study network).

4. Travel through the corridor extends from the Bollinger Canyon Road diagonal on-ramp gore to the Sheridan Road on-ramp gore

5. Travel through the corridor extends from the Washington Boulevard on-ramp gore to the Bollinger Canyon Road off-ramp gore

Northbound I-680 operates near the speed limit with little delay for the AM peak period. Speeds are substantially lower throughout the PM peak period (averaging 46.9 mph), and the maximum individual delay (11.3 minutes) is high compared to the average travel time (23.4 minutes), which indicates heavy congestion.

2.1.7.2 Environmental Consequences

Future year traffic conditions were analyzed for year 2025 and year 2045 conditions, for both the before-project and after-project scenarios (also known as the No Project and Plus Project conditions, respectively). As there is only one project alternative under consideration, only one Plus Project scenario is analyzed.

Opening Year (2025)

Bottlenecks: Year 2025 No Project

Southbound AM. The existing southbound AM peak period bottleneck between the Sunol Boulevard on-ramp and the Koopman Road off-ramp would last from 5:30 AM to past 10:00 AM and extend to the eastbound I-580/Dublin Boulevard off-ramp.

Southbound PM. During the PM peak period, the southbound I-680 bottleneck between the Bollinger Canyon Road diagonal on-ramp and the Alcosta Boulevard off-ramp would last from 3:30 PM to 7:00 PM, and queues from this bottleneck would reach past the Crow Canyon Road interchange. In addition, the southbound I-680 bottleneck between the Stoneridge Drive diagonal on-ramp and the Bernal Avenue off-ramp would last from 4:30 PM to 7:00 PM, and backups would extend to the Alcosta Boulevard diagonal on-ramp.

Northbound AM. On northbound I-680 in the AM peak period, traffic would continue to operate under free-flow conditions.

Northbound PM. On northbound I-680 in the PM peak period, completion of the SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 29763) would remove the existing bottleneck approaching Calaveras Road (SR 84). Completion of the I-680 Northbound Express Lane Project from SR 262 (Mission Boulevard) to north of the SR 84 interchange (EA 4G050) would improve the bottleneck between the Washington Boulevard on-ramp and the Mission Boulevard (SR 238) off-ramp. During the PM peak period, a bottleneck would form in the weave section on northbound I-680 between the Stoneridge Drive diagonal on-ramp and the eastbound I-580 off-ramp from 4:30 PM to 7:00 PM. Heavy demand in the right lane approaching the off-ramp to eastbound I-580 could result in queueing to the Bernal Avenue on-ramp.

Bottlenecks: Year 2025 Plus Project

Southbound AM. The project would eliminate the southbound AM peak period bottleneck between the Sunol Boulevard on-ramp and the Koopman Road off-ramp that is predicted under No Project conditions; however, improved flow along southbound I-680 would result in a bottleneck between the Paloma Way (SR 84) on-ramp and the Andrade Road off-ramp from 6:30 AM to 7:30 AM. The queue from this bottleneck would reach as far as the southbound SR 84 connector on-ramp, a distance of 0.3 mile.

Southbound PM. In the PM peak period, the southbound I-680 bottleneck between the Bollinger Canyon Road diagonal on-ramp and the Alcosta Boulevard off-ramp would last from 3:30 PM to 7:00 PM, as it would under No Project conditions. No improvement at this bottleneck is expected because it is upstream of the proposed project improvements. The southbound I-680 bottleneck between the Stoneridge Drive diagonal on-ramp and the Bernal Avenue off-ramp that occurs under No Project conditions would be inactive during the PM peak period under Plus Project conditions. This condition would represent an improvement over No Project conditions, where the bottleneck would last for 2.5 hours.

Northbound AM. During the AM peak period, northbound I-680 would operate at free-flow conditions, as it would under No Project conditions.

Northbound PM. Under Plus Project conditions, there would still be a PM peak period bottleneck along northbound I-680 in the Stoneridge Drive diagonal on-ramp to the eastbound I-580 off-ramp weave section. However, the bottleneck would only last from 5:30 PM to 6:00 PM, compared with 4:30 PM to 7:00 PM under No Project conditions.

Levels of Service: Year 2025 No Project

During the AM peak, southbound I-680 would operate at LOS F between the I-580 westbound off-ramp and the Sunol Boulevard on-ramp merge. This section of LOS F conditions is a result of the bottleneck between the Sunol Boulevard on-ramp and Koopman Road off-ramp. Under existing conditions, LOS F operations only extend to the Dublin Boulevard on-ramp merge section. All other segments along southbound I-680 would operate at LOS E or better.

Throughout the AM peak, northbound I-680 would operate at LOS E or better as the facility would be generally uncongested.

During the PM peak, spillback from the southbound I-680 bottleneck between the Bollinger Canyon diagonal on-ramp and the Alcosta Boulevard off-ramp would result in LOS F conditions in the merge section for the Bollinger Canyon Road diagonal on-ramp. In addition, queue spillback from the southbound I-680 bottleneck between the Stoneridge Drive diagonal on-ramp and Bernal Avenue off-ramp would result in LOS F conditions between the I-580 westbound off-ramp and the Sunol Boulevard on-ramp merge section.

Under PM peak conditions, northbound I-680 would operate at LOS F between the Bernal Avenue off-ramp and the Stoneridge Drive loop on-ramp, due to the bottleneck at the weave section between the Stoneridge Drive loop on-ramp and the eastbound I-580 off-ramp.

Levels of Service: Year 2025 Plus Project

During the AM peak, northbound and southbound I-680 would operate at or near free flow conditions (LOS E or better). The improvement in southbound I-680 LOS is attributed to the project's addition of the HOV/express lane through the No Project bottleneck between the Sunol Boulevard on-ramp and Koopman Road off-ramp.

During the PM peak, northbound I-680 would operate at LOS F from the Stoneridge Drive off-ramp to the Stoneridge Drive loop on-ramp. This condition would represent a reduction in the number of segments operating at LOS F from five under No Project conditions to one under Plus Project conditions.

The merge area for the Stoneridge Drive diagonal on-ramp to southbound I-680 would operate at LOS F during the PM peak, as it would under No Project conditions. However, the No Project bottleneck between the Stoneridge Drive diagonal on-ramp and the Bernal Avenue off-ramp would not be active under Plus Project conditions, and the overall speed in the general-purpose lanes would be above 35 mph, an improvement compared to No Project conditions.

Year 2025 Measures of Effectiveness

Table 2.1.7-2 lists the network measures of effectiveness for the Year 2025 No Project, Plus Full Project, and Plus Phase 1 Project conditions. The Plus Phase 1 Project represents conditions if only the southbound HOV/express lane was in operation.

The project would not change the number of vehicles served in the study area throughout the course of each study period; this is to be expected as the total demand volumes between the No Project and Plus Project scenarios are nearly identical. The total number of vehicles forecast to use I-680 south of SR 84 (the Sunol Grade), I-680 north of Bollinger Canyon Road, and SR 84 in Sunol and through Niles Canyon is equal for both the No Project and Plus Project scenarios because the project would not improve capacity at any of those study area gateways. The project would result in a reduction in the diversion of through trips to parallel arterials and the SR 84 corridor to the east of I-680; accordingly, the Plus Project scenario forecasts reflect a higher demand on the I-680 corridor within the project improvement area, but the overall system demand at the gateways remains constant.

Table 2.1.7-2: Year 2025 Network Measures of Effectiveness

Measure	AM Peak Period ¹ Year 2025 No Project	AM Peak Period ¹ Year 2025 Plus Full Project	AM Peak Period ¹ Year 2025 Plus Phase 1 Project	PM Peak Period ² Year 2025 No Project	PM Peak Period ² Year 2025 Plus Full Project	PM Peak Period ² Year 2025 Plus Phase 1 Project
All Segments-Locations³						
Volume Served	185,200	185,200	185,200	177,410	177,410	177,410
VMT	1,956,000	1,961,000	1,958,000	1,783,000	1,786,000	1,785,000
VHD in hours	8,240	4,410	5,590	5,390	3,540	4,120
Southbound I-680 Through Study Corridor⁴						
Average Travel Time (minutes)	19.6	14.4	14.4	15.6	14.6	14.6
Average Travel Speed (mph)	51.7	65.8	65.8	60.6	63.9	63.9
Maximum Individual Vehicle Delay (minutes)	17.4	1.1	1.1	5.8	1.4	1.4
Northbound I-680 Through Study Corridor⁵						
Average Travel Time (minutes)	16.4	16.4	16.4	17.4	16.2	17.4
Average Travel Speed (mph)	64.7	65.1	64.7	61.7	65.7	61.7

Measure	AM Peak Period ¹ Year 2025 No Project	AM Peak Period ¹ Year 2025 Plus Full Project	AM Peak Period ¹ Year 2025 Plus Phase 1 Project	PM Peak Period ² Year 2025 No Project	PM Peak Period ² Year 2025 Plus Full Project	PM Peak Period ² Year 2025 Plus Phase 1 Project
Maximum Individual Vehicle Delay (minutes)	1.0	0.5	1.0	4.1	0.5	4.1

Notes:

Delay is calculated relative to 65 mph on freeways.

1. AM peak period represents 8 hours from 5:00 AM to 1:00 PM

2. PM peak period represents 7 hours from 2:00 PM to 9:00 PM

3. Combined statistics of all origin-destination pairs (i.e., mainlines, entry and exit points, all on- and off-ramps, and intersections in the study network).

4. Travel through the corridor extends from the Bollinger Canyon Road diagonal on-ramp gore to the Sheridan Road on-ramp gore

5. Travel through the corridor extends from the Washington Boulevard on-ramp gore to the Bollinger Canyon Road off-ramp gore

As shown in Table 2.1.7-2, peak period VMT is almost identical between the No Project and Plus Project scenarios (less than a 1 percent increase from No Project to Plus Full Project). The modeled increase in VMT is attributed to more vehicles remaining on the mainline rather than diverting to other routes under Plus Project conditions. With the project, VHD in the study area would decrease by between 20 and 45 percent during the study periods (5:00 AM to 1:00 PM and 2:00 PM to 9:00 PM).

Along southbound I-680, AM peak period travel times and travel speeds would improve with the project compared to the No Project condition, as the HOV/express lane would better accommodate demand volumes in the bottleneck between the Sunol Boulevard on-ramp and Koopman Road off-ramp. This improvement is shown in Table 2.1.7-2: travel time (minutes) reduces from No Project to Plus Project, and average travel speeds improve (mph increases from No Project to Plus Project). Travel time along the corridor under the Plus Project condition would also be more reliable than under the No Project condition due to the projected reductions in congestion. Similar benefits would occur in the PM peak period.

Along northbound I-680, travel times, speeds, and delays would remain nearly constant for the AM peak period, as the facility would be uncongested in both the No Project and Plus Project scenarios throughout the AM peak period. In the PM peak period, travel time under the Plus Project condition would decrease by nearly 5 percent, and travel speed would increase by about 6 percent. Also, travel time reliability would improve, as the maximum individual delay with the project would decrease from 4.1 minutes to 0.5 minute.

As discussed further in Section 1.4.1, the project is anticipated to be constructed in two phases. Phase 1 would construct the southbound HOV/express lane and all project-related improvements in the median (both northbound and southbound). Phase 2 would construct the northbound HOV/express lane. In Year 2025, if only Phase 1 is operational, it would decrease vehicle hours of delay in the study area by between 23 and 32 percent compared with the No Project condition. On southbound I-680, Phase 1 would result in lower average travel times, higher average travel speeds, and lower maximum individual delays than the No Project condition. The travel times, speeds, and individual delays for southbound I-680 with Phase 1 would be the same as with the Plus Project condition (both phases constructed). Travel times, travel speeds, and maximum individual delays on northbound I-680 would be the same as with the No Project condition.

HOV/Express Lane Operations

HOV/express lanes, like HOV lanes, are administered under a federal mandate that requires HOV/express lanes to operate at 45 mph (or higher) during the peak hour and peak period. Generally, this requires the vehicle throughput in the HOV/express lane to remain at or below 1,650 vph per lane. The traffic analysis accounted for the flow in the HOV/express lane to ensure that volumes do not exceed the 1,650 vph threshold.

The Year 2025 peak hour HOV/express lane volumes would be at or below 1,650 vehicles, indicative of acceptable operations in the segments of the HOV/express lane with heaviest use. All HOV/express lane segment speeds would be above 50 mph, which indicates that the HOV/express lane operations would meet the federal operational guidelines. The temporal and physical locations of the peak hour of HOV/express lane volume vary between models as the HOV/express lanes are continuous access, and the flow is subject to the severity and duration of congestion associated with the bottlenecks in the model.

Opening Year Sensitivity Analysis

The project, as initially envisioned, is anticipated to open to traffic in late 2025. However, due to funding and other constraints, the project may open in 2026. As noted in the summary of Year 2025 conditions above, the project would result in reductions in travel time, increases in travel speed, and reductions in VHD. The improvements in these measures of effectiveness for congested corridors—southbound I-680 in the morning and both directions of I-680 in the afternoon—typically range from 5 to 45 percent. The annual growth rate in demand volumes along the I-680 corridor is between 1 and 2 percent. Therefore, it is anticipated that Year 2026 traffic operations would be similar to Year 2025 traffic operations, and the project would still yield substantial benefits to the traveling public if it were to open in Year 2026 instead of Year 2025.

Design Year (2045)

Bottlenecks: Year 2045 No Project

Southbound AM. Under No Project conditions, the bottleneck on southbound I-680 between the Sunol Boulevard on-ramp and Koopman Road off-ramp would last from 5:00 AM to 12:30 PM. The queue from this bottleneck would extend beyond the Crow Canyon Road interchange, outside of the study area. Under Year 2025 No Project conditions, this bottleneck was active between 5:30 AM and 10:30 AM.

An AM peak period bottleneck would also form on southbound I-680 between the Bollinger Canyon Road diagonal on-ramp and Alcosta Boulevard off-ramp from 11:30 AM to past 1:00 PM. The queue for this bottleneck would extend beyond the Crow Canyon Road interchange, outside of the study area.

Southbound PM. During the PM peak period, a southbound I-680 bottleneck between the Bollinger Canyon Road diagonal on-ramp and the Alcosta Boulevard off-ramp would last from 2:00 PM to past 9:00 PM. This bottleneck was identified as active between 3:30 PM and 7:30 PM under Year 2025 No Project conditions. The queues from this bottleneck would extend past the I-680/Crow Canyon Road interchange, outside of the study area.

The southbound I-680 bottleneck between the Stoneridge Drive diagonal on-ramp and the Bernal Avenue off-ramp would last from 4:30 PM to 7:00 PM, as it would be under Year 2025 No Project conditions. In Year 2025, the queues from this bottleneck would extend to the Alcosta Boulevard diagonal on-ramp; in Year 2045, the queues would extend past the Crow Canyon Road interchange, outside of the study area.

Northbound AM. During the AM peak period, three new bottlenecks that were not active in Year 2025 would form along northbound I-680:

- Between the Alcosta Boulevard on-ramp and the Bollinger Canyon Road off-ramp from 7:30 AM to 10:00 AM, with queue spillback beyond the Washington Boulevard interchange, outside of the study area.
- Between the Bernal Avenue on-ramp and Stoneridge Drive off-ramp from 9:30 AM to 11:30 AM, with queue spillback beyond the Washington Boulevard interchange. This bottleneck would form when the system is recovering from congestion associated with the Alcosta Boulevard to Bollinger Canyon Road bottleneck described above, and it would be hidden by queue spillback from that bottleneck between 8:00 AM and 9:30 AM.
- Between the Andrade Road on-ramp and Calaveras Road (SR 84) off-ramp from 8:00 AM to 8:30 AM and from 10:30 AM to past 1:00 PM, with queue spillback beyond the Washington Boulevard interchange.

Northbound PM. Under Year 2045 No Project conditions for the PM peak period, a bottleneck would also form along northbound I-680 between the Andrade Road on-ramp and Calaveras Road (SR 84) off-ramp from 2:30 PM to 5:30 PM as well as from 8:00 PM to past 9:00 PM. Queue spillback would extend beyond the Washington Boulevard interchange. This existing bottleneck would be inactive under Year 2025 No Project conditions due to completion of the I-680 Northbound Express Lane Project.

Another PM peak period bottleneck would form along northbound I-680 between the Bernal Avenue on-ramp and Stoneridge Avenue off-ramp from 3:30 PM to 4:00 PM and 7:30 PM to 8:00 PM, with queue spillback beyond the Washington Boulevard interchange. This bottleneck would not exist under Year 2025 No Project conditions.

The PM peak period bottleneck in the weave section along northbound I-680 between the Stoneridge Drive diagonal on-ramp and the eastbound I-580 off-ramp would last from 4:00 PM to 7:30 PM, compared with 4:30 PM to 7:00 PM under Year 2025 No Project conditions. The queue from this bottleneck would extend beyond the Washington Boulevard interchange, compared with the Bernal Avenue on-ramp under Year 2025 No Project conditions.

In addition, a bottleneck would form along northbound I-680 between the Sunol Boulevard on-ramp and the Bernal Avenue off-ramp between 8:00 PM and 8:30 PM. The queue for this bottleneck would extend to the Sunol Boulevard off-ramp gore.

Bottlenecks: Year 2045 Plus Project

Southbound AM. During the AM peak period, a southbound I-680 bottleneck between the Sunol Boulevard on-ramp and Koopman Road off-ramp would last from 6:30 AM to 7:30 AM, and the maximum queue spillback would extend to the Bernal Avenue on-ramp. This condition

would represent an improvement over Year 2045 No Project conditions, when the bottleneck would last for 7.5 hours and the queues would reach beyond the Crow Canyon Road interchange.

As with Year 2025 Plus Project conditions for the AM peak period, improved flow along southbound I-680 would result in a bottleneck between the Paloma Way (SR 84) on-ramp and the Andrade Road off-ramp. Under Year 2045 conditions, the bottleneck would last from 5:30 AM to 8:30 AM, compared with 6:30 AM to 7:30 AM for Year 2025. The queue from this bottleneck would reach as far as the Paloma Way (SR 84) off-ramp, a distance of about 0.8 mile, compared with a Year 2025 queue spillback to the southbound SR 84 connector on-ramp, a distance of 0.3 mile.

A bottleneck would also form on southbound I-680 between the Alcosta Boulevard diagonal on-ramp and the eastbound I-580/Dublin Boulevard off-ramp between 8:00 AM and 11:00 AM due to high off-ramp demand. The queue spillback would extend beyond the Crow Canyon Road interchange.

Southbound PM. During the PM peak period, the southbound I-680 bottleneck between the Bollinger Canyon Road diagonal on-ramp and the Alcosta Boulevard off-ramp would last from 2:00 PM to past 9:00 PM, compared with 3:30 PM to 7:00 PM under Year 2025 conditions. The project would improve conditions in this area as the bottleneck, under Year 2045 No Project conditions, would merge with queues resulting from the Stoneridge Drive to Bernal Avenue bottleneck between 5:30 PM and 7:00 PM.

A southbound I-680 bottleneck between the Stoneridge Drive diagonal on-ramp and the Bernal Avenue off-ramp, which was inactive under Year 2025 conditions, would last from 5:00 PM to 6:30 PM under Year 2045 conditions. The maximum queue for this bottleneck will reach as far back as the I-580 on-ramp. This condition would represent an improvement over No Project conditions, when the bottleneck would last for 2.5 hours and result in queue spillback to the Crow Canyon Road interchange, outside of the study area.

Northbound AM. In the northbound direction, an AM peak period bottleneck on northbound I-680 between the Alcosta Boulevard on-ramp and Bollinger Canyon Road off-ramp would last from 7:30 AM to 10:30 AM. The bottleneck would last a half hour longer than with the No Project scenario because of increased throughput along the corridor with the proposed project.

Another AM peak period bottleneck between the Bernal Avenue on-ramp and Stoneridge Drive off-ramp would last from 10:00 AM to 11:00 AM; under Year 2045 No Project conditions, this bottleneck would persist until 12:00 PM.

A bottleneck along northbound I-680 between the Andrade Road on-ramp and Calaveras Road (SR 84) off-ramp would last from 8:00 AM to 10:00 AM and from 10:30 AM to 11:00 AM. With No Project, this bottleneck would last from 8:00 AM to 8:30 AM and from 10:30 AM to past 1:00 PM.

Northbound PM. In the PM peak period, a bottleneck would form along northbound I-680 between the Andrade Road on-ramp and Calaveras Road (SR 84) off-ramp between 2:30 PM and 8:30 PM, with queue spillback past the Washington Boulevard interchange (outside of the study area). Under Year 2045 No Project conditions, the bottleneck would last past 9:00 PM.

The PM peak period bottleneck in the weave section along northbound I-680 between the Stoneridge Drive diagonal on-ramp and the eastbound I-580 off-ramp would last from 4:00 PM to 7:30 PM, same as under Year 2045 No Project conditions. Under Plus Project conditions, the queue spillback would extend to the Bernal Avenue off-ramp gore; under No Project conditions, the queue spillback would extend past the Washington Boulevard interchange (outside of the study area).

Levels of Service: Year 2045 No Project

During the AM peak, southbound I-680 would operate at LOS F between the Bollinger Canyon Road diagonal on-ramp merge and the Sunol Boulevard on-ramp merge. These segments of LOS F operations are a result of the active, controlling bottleneck between the Sunol Boulevard on-ramp and Koopman Road off-ramp. All other segments along southbound I-680 would operate at LOS E or better.

During the AM peak, northbound I-680 would operate at LOS F between the Stoneridge Drive diagonal on-ramp and the Alcosta Boulevard on-ramp merge. All other segments along northbound I-680 would operate at LOS E or better.

During the PM peak, spillback from the southbound I-680 bottleneck between the Stoneridge Drive diagonal on-ramp and the Bernal Avenue off-ramp would result in LOS F conditions between the Bollinger Canyon Road diagonal on-ramp merge and the Stoneridge Drive diagonal on-ramp merge.

During the PM peak, northbound I-680 would operate at LOS F between the Mission Boulevard (SR 238) off-ramp and the Stoneridge Drive loop on-ramp. All other segments along northbound I-680 would operate at LOS E or better.

Levels of Service: Year 2045 Plus Project

During the AM peak, southbound I-680 would operate at LOS F between the Paloma Way (SR 84) off-ramp gore and the Paloma Way (SR 84) on-ramp gore. Except for the Sunol Boulevard on-ramp merge (which operates near the cusp of LOS E/F), all other segments along southbound I-680 would operate at LOS E or better.

Northbound I-680 would operate at LOS F between the Dublin Boulevard to Alcosta Boulevard basic section and the Alcosta Boulevard on-ramp merge. All other segments along northbound I-680 would operate at LOS E or better.

During the PM peak, only the northbound I-680 from the Mission Boulevard (SR 238) off-ramp to the Andrade Road on-ramp segment and the Bernal Avenue on-ramp and the Stoneridge drive loop on-ramp segment would operate at LOS F conditions. These conditions represent a substantial reduction in the number of segments operating at LOS F compared to Year 2045 No Project conditions.

Southbound I-680 is projected to operate at LOS F at the Bollinger Canyon Road diagonal on-ramp merge as well as between the I-580 on-ramp and the Stoneridge Drive diagonal on-ramp. These conditions represent an improvement in operations as these two areas of LOS F operations were connected under Year 2045 No Project conditions.

All other segments along northbound and southbound I-680 would operate at LOS E or better.

Year 2045 Measures of Effectiveness

Table 2.1.7-3 lists measures of effectiveness for the Year 2045 No Project, Plus Full Project, and Plus Phase 1 Project conditions. The Plus Phase 1 Project represents conditions if only the southbound HOV/express lane was in operation.

The project would increase the number of vehicles served in the study area by about 2 percent. As shown in Table 2.1.7-3, peak period VMT is estimated to increase by 3 to 5 percent between the No Project and Plus Project scenarios. With the project, VHD in the study area would decrease by between 25 and 55 percent over the course of the study periods (5:00 AM to 1:00 PM and 2:00 PM to 9:00 PM).

Along southbound I-680, AM peak period travel times and travel speeds would improve with the project compared to the No Project condition, as the HOV/express lane would better accommodate demand volumes in the bottleneck between the Sunol Boulevard on-ramp and Koopman Road off-ramp. Travel speeds with the project would increase as much as 90 percent in the AM peak period, with a corresponding travel time reduction of nearly 55 percent. Travel time along the corridor would also be more reliable due to the projected reductions in congestion; the AM peak period maximum individual delay is projected to decrease by over 85 percent. In the PM peak period, travel time and speed would improve in the range of 10 to 15 percent, and maximum individual delay would decrease by over 75 percent.

Along northbound I-680, travel times, speeds, and delays with the project would improve in both the AM and PM peak periods. In the AM peak period, the average travel time would decrease by about 25 percent, average travel speeds would increase by about 20 percent, and the maximum individual delay would decrease by about 50 percent. In the PM peak period, travel time would decrease by nearly 25 percent, and travel speeds would increase by about 20 percent. Travel time reliability would improve, as the maximum individual delay would decrease with the project from 46.6 minutes to 20.4 minutes (a reduction of over 55 percent).

In Year 2045, if only Phase 1 is operational, it would reduce vehicle hours of delay in the study area by between 19 and 33 percent compared with the No Project condition. On southbound I-680, Phase 1 would result in lower average travel times, higher average travel speeds, and lower maximum individual delays than the No Project condition. The travel times, speeds, and individual delays for southbound I-680 with Phase 1 would be the same as with the Plus Project condition (both phases constructed). Travel times, travel speeds, and maximum individual delays on northbound I-680 would be the same as with the No Project condition.

Table 2.1.7-3: Year 2045 Network Measures of Effectiveness

Measure	AM Peak Period ¹ Year 2045 No Project	AM Peak Period ¹ Year 2045 Plus Full Project	AM Peak Period ¹ Year 2045 Plus Phase 1 Project	PM Peak Period ² Year 2045 No Project	PM Peak Period ² Year 2045 Plus Full Project	PM Peak Period ² Year 2045 Plus Phase 1 Project
All Segments- Locations³						
Volume Served	226,040	229,820	228,490	217,930	222,450	219,090
VMT	2,401,000	2,514,000	2,475,000	2,357,000	2,422,000	2,390,000
VHD in hours	49,500	23,000	32,980	51,500	39,500	41,740
Southbound I-680 through Study Corridor⁴						
Average Travel Time (minutes)	35.4	16.8	16.8	17.9	15.4	15.4
Average Travel Speed (mph)	29.7	56.3	56.3	54.5	60.5	60.5
Maximum Individual Vehicle Delay (minutes)	46.9	7.0	7.0	14.3	3.3	3.3
Northbound I-680 Through Study Corridor⁵						
Average Travel Time (minutes)	33.3	25.8	33.3	37.7	28.0	37.7
Average Travel Speed (mph)	42.3	50.1	42.3	34.0	41.0	34.0
Maximum Individual Vehicle Delay (minutes)	72.5	36.4	72.5	46.6	20.4	46.6

Notes:

Delay is calculated relative to 65 mph on freeways.

1. AM peak period represents 8 hours from 5:00 AM to 1:00 PM

2. PM peak period represents 7 hours from 2:00 PM to 9:00 PM

3. Combined statistics of all origin-destination pairs (i.e., mainlines, entry and exit points, all on- and off-ramps, and intersections in the study network).

4. Travel through the corridor extends from the Bollinger Canyon Road diagonal on-ramp gore to the Sheridan Road on-ramp gore

5. Travel through the corridor extends from the Washington Boulevard on-ramp gore to the Bollinger Canyon Road off-ramp gore

HOV/Express Lane Operations

In Year 2045, the peak hour HOV/express lane volumes would be at or below 1,650 vehicles, indicative of acceptable operations on the segments of the HOV/express lane with heaviest use. All HOV/express lane segment speeds would be above 50 mph, which indicates that the HOV/express lanes would meet the federal operational guidelines. The temporal and physical locations of the peak hour of HOV/express lane volume vary between models as the HOV/express lanes are continuous access, and the flow is subject to the severity and duration of congestion associated with the bottlenecks in the model.

Design Year Sensitivity Analysis

The project, as initially envisioned, is anticipated to open to traffic in late 2025. However, due to funding and other constraints, the project may open in 2026. This would result in the design year being Year 2046 rather than Year 2045. The improvements in measures of effectiveness with the project for Year 2045 typically range from between 10 and 70 percent. The annual growth rate in demand volumes along the I-680 corridor is between 1 and 2 percent. Therefore, Year 2046 traffic operations are anticipated to be similar to Year 2045 traffic operations, and the project would still yield substantial benefits to the traveling public if the design year for the project was Year 2046 instead of Year 2045.

Construction Impacts

No Build Alternative

The No Build Alternative would not result in construction impacts.

Build Alternative

Construction would involve adding an HOV/express lane adjacent to the median in each direction of I-680 throughout the project limits. The addition of the would require reconstructing and paving along the median adjacent to the existing freeway lanes, as well as some widening of pavement on the inside or outside of the existing freeway to create the necessary pavement width to accommodate the proposed express lanes. Construction would also involve installation of signs, tolling equipment, utility connections, and other equipment and facilities along the freeway. These installations would require periodic lane and shoulder closures at active construction locations that will be short-term and temporary. When possible, work would be performed at night to avoid peak travel periods to minimize traffic disruption. A TMP will be prepared during final design to define lane closures and to use for public outreach to inform local agencies and the public of the times and locations when construction will occur. Traffic disruption during construction is therefore not anticipated to have substantial adverse effects, and when it occurs, it will be temporary in duration.

2.1.7.3 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are required.

2.1.8 Visual/Aesthetics

2.1.8.1 Regulatory Setting

NEPA of 1969, as amended, 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 USC 4331[b][2]). To further emphasize this point, 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.

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” (PRC Section 21001[b]).

California Streets and Highways Code Section 92.3 directs Caltrans to use drought resistant landscaping and recycled water when feasible, and incorporate native wildflowers and native and climate-appropriate vegetation into the planting design when appropriate.

I-680 in the project limits is within the Officially Designated State Scenic Highway limits. Five elements are required by California Guidelines for Official Designation of Scenic Highways:

- Regulation of land use and intensity (density) of development;
- Detailed land and site planning processes;
- Prohibition of off-site outdoor advertising and control of on-site outdoor advertising;
- Careful attention to and control of earthmoving and landscaping; and
- Design and appearance of structures and equipment.

2.1.8.2 Affected Environment

Fundamentals of Visual Impact Assessments

The information presented in this section is from the *Visual Impact Assessment* (VIA) for the proposed project completed in September 2019 (Haygood & Associates 2019). The terminology and methodology used within the VIA are based on the *Visual Impact Assessment for Highway Projects* guidelines (FHWA 1988) and are briefly described below.

- **Visual character:** attributes of views within a project corridor such as form, line, color, texture, dominance, and glare. Visual character is neither inherently “good” nor “bad”; however, a change in visual character can be evaluated when it is compared to the viewer response to that change.
- **Visual quality:** evaluated by identifying the vividness, intactness, and unity present in the project corridor.
 - **Vividness** is the extent to which the landscape is memorable and associated with distinctive, contrasting, and diverse visual elements;

- **Intactness** is the integrity of the visual features and extent to which the existing landscape is free from non-typical visual intrusions; and
- **Unity** is the extent to which all visual elements combine to form a coherent, harmonious visual pattern.
- **Resource change** is assessed by evaluating the visual character and quality of visual resources within a project corridor before and after construction of a proposed project.
- **Viewers** are people whose views of the landscape may be altered by a project—either because the landscape itself has changed or because their perception of the landscape has changed. There are two major types of viewer groups for highway projects:
 - **Highway users** are people who have views from the road. They can be subdivided into different viewer groups in two different ways:
 - mode of travel (e.g., pedestrians, bicyclists, transit riders, car drivers and passengers, and truck drivers).
 - reason for travel (e.g., tourism, commute, and commercial vehicles).
 - **Highway neighbors** are people who have views to the road. They can be subdivided into different viewer groups by land use. For example, residential, commercial, industrial, retail, institutional, civic, educational, recreational, and agricultural land uses may generate highway neighbors or viewer groups with distinct reasons for being in the corridor and therefore having distinct responses to changes in visual resources.
- **Viewer response** is a measure or prediction of the viewer’s reaction to changes in the visual environment. Viewer response has two dimensions:
 - **Viewer exposure** is a measure of the viewer’s ability to see an object, based on the viewer’s location in relation to the object, how many viewers see the object, and how long the object is in view.
 - **Viewer sensitivity** is a measure of the viewer’s recognition of an object and tends to correlate with whether viewers will have a high concern for any visual change.

Visual Setting in the Project Area

The study area for the VIA is the area of land that is visible from, adjacent to, and outside of the I-680 ROW, and is determined by topography, vegetation, and viewing distance. The landscape is characterized by hilly terrain south of the Bernal Avenue interchange and flat terrain to the north of the interchange in the San Ramon Valley. Surrounding both areas are mountains and ridges. The most scenic visual resources in the region visible from the project are Mount Hamilton, Mission Peak, and the Maguire Peaks to the south and Mount Diablo to the north. Also visible are the Pleasanton and Apperson Ridges to the south of SR 84. The upper regions of the hills and mountains remain natural in character due to their status as protected open space.

Land use designations in the project area are discussed in Section 2.1.1.1. The land uses on I-680 to the south of the interchange with SR 84 are rural, agriculture-based commercial, and quarries. Land uses on I-680 between the interchange with SR 84 and Stoneridge Drive are rural to

suburban, with residential, commercial, golf course recreational, and other recreational development. Land uses between Stoneridge Drive and Amador Valley Boulevard are commercial. Between Amador Valley Boulevard to just north of Alcosta Boulevard, land uses consist of both residential and commercial development.

Within the project limits, I-680 is an Officially Designated State Scenic Highway between PM R6.4/R21.9 in Alameda County and PM R0.0/R14.4 in Contra Costa County, offering views of Mission Peak, Maguire Peaks, and the Pleasanton and Apperson Ridges to the south and Mount Diablo to the north. I-680 is also a Classified Landscaped Freeway between PM 18.40/19.85 and R20.42/R21.88 in Alameda County and PM R0.00/R2.76 in Contra Costa County. This classification assists in the regulation of outdoor advertising placement.

Visual Character and Visual Quality

The project corridor was divided into the following three visual assessment units, each with its own visual character and visual quality. Each visual assessment unit is differentiated from other units both by its dimensions and its visual resources.

- **Landscape Unit A - I-680 From Paloma Way to Sunol Boulevard**

The I-680 corridor between south of Paloma Way and Verona Road in Sunol is within a rural landscape (with one commercial and sporadic residential development screened by vegetation and embankment slopes) and transitions to a semi-rural character between Verona Road and Sunol Boulevard in Pleasanton. Residential development exists east of I-680 at the Sunol Boulevard off-ramp, but it is below the freeway and screened by embankment slopes and vegetation. From highway vantage points, striking views are afforded of Mount Hamilton, Mission Peak, and the Maguire Peaks to the south, as well as views of the Pleasanton and Apperson Ridges to the south of SR 84. Views in all directions from I-680 include the natural environment with memorable landforms, grasslands, and oak woodlands.

Summary of Existing Quality: Vividness = High; Intactness = High; Unity = High

Overall Existing Quality: High

- **Landscape Unit B - I-680 From Sunol Boulevard to Stoneridge Drive**

The I-680 corridor between Sunol Boulevard and Stoneridge Drive in Pleasanton is within a suburban environment. To the east of the highway, land uses include residential, the Alameda County Fairgrounds, commercial, and the Dublin San Ramon Waste Water Treatment Facility. To the west of the highway, land use is residential interspersed with neighborhood parks and trails. From I-680 vantage points, views of adjacent land uses are often heavily screened by vegetation and intervening topography with background views to the west of the hills and to the east of Mount Diablo.

Summary of Existing Quality: Vividness = Moderate-High; Intactness = Moderate-Low; Unity = Moderate

Overall Existing Quality: Moderate

- **Landscape Unit C - I-680 from Stoneridge Drive to Alcosta Boulevard**

The I-680 corridor between Stoneridge Drive in Pleasanton and Alcosta Boulevard in San Ramon is within a suburban environment with multistory office structures visible through screening vegetation within and adjacent to the highway. Many commercial buildings are set back a distance from the freeway, and therefore not in foreground views. At the I-580/I-680 interchange, there are multiple layers of bridges and connector ramps, pavement, barriers, lights, signs and mature vegetation along southbound I-680. Multistory commercial properties and buildings are clustered in all four quadrants of the interchange. Between the I-580/I-680 interchange and Alcosta Boulevard, sound walls are at both sides of the highway. Vegetation partially screens the sound walls south of the Alcosta Boulevard interchange.

Summary of Existing Quality: Vividness = Moderate; Intactness = Low; Unity = Low

Overall Existing Quality: Low

Viewers, Viewer Response, and Viewer Sensitivity

The following discusses the project's highway users and highway neighbors and their anticipated response to changes in their visual environment.

Highway Users. No pedestrian or bicycle traffic is allowed on I-680, so highway users consist of motor vehicle drivers and passengers. The estimated daily person trips on I-680 within the project area between SR 84 and Alcosta Boulevard is 61,712. Vehicle occupancy is estimated to be 1.4 persons (Caltrans and National Renewable Energy Laboratory 2013). During periods of free flow travel (at the posted speed limit of 65 mph), the 9-mile-long I-680 segment of the project can be traversed in approximately 11 minutes.

Daily commuters may have an increased exposure to views from the road due to the amount of time spent on the highway each day. Those who experience congested traffic conditions would tend to focus views toward the highway itself. Drivers traveling at normal highway speeds usually focus attention on long range nonperipheral views. Durations of exposure to views from the highway may vary from moderate to moderate-high. Passengers have high durations of exposure to views.

Highway Neighbors. The following highway neighbors were identified within the project corridor:

- *Community Residents.* Land uses adjacent to I-680 vary from sparsely populated with single-family residential communities in the southern project area near SR 84 to dense single-family and multifamily developments to the north. Because of long durations of exposure to views from their residential and neighborhood vantage points, residents are the viewer group considered to be the most concerned about the ways in which projects bring about changes within their viewshed.
- *Recreation Areas.* Several recreation facilities and existing trails are near or adjacent to I-680, including Pleasanton Ridge Regional Park, Meadowlark Park, Muirwood Community Park, and the Marilyn Murphy Kane Trail and Centennial Trail. Bicyclists, pedestrians, and equestrians using trails and parks would have moderate durations of

exposure to views toward the highway and would all have moderate-low to moderate-high exposure levels to any project feature placed within their viewshed, depending on the distance between their vantage point and the location of the project feature and upon intervening vegetation. Trail and park users would have moderate-low to moderate-high levels of sensitivity to project features placed within their viewshed, depending on their distance from the feature, intervening vegetation, and how focused they are on their recreation activity.

- *Schools.* Fountainhead Montessori School and Dublin Elementary School are near or adjacent to I-680. The level of visual exposure and visual sensitivity of persons attending school would be moderate-low when gathering and playing in outdoor sitting and recreation areas and would be low while engaged in studies.
- *Churches.* Churches near or adjacent to the project include Valley Bible Church and Resurrection Lutheran Church/JooSonGil Presbyterian Korean Church. Those who gather at spiritual places often spend time outside at entrances and patios and also view the environment through windows. The level of churchgoers' visual exposure may vary from low to moderate, and their visual sensitivity may vary from low to moderate depending on individual perceptions and directions of focus.
- *Commercial Areas.* There are 11 single-service commercial land uses within close range of the I-680 interchange with SR 84. Large shopping centers are located at the Bernal interchange east of I-680 in Pleasanton and, at the interchanges with Stoneridge Drive and I-580 in Pleasanton and Dublin. A local shopping center is on Alcosta Boulevard to the west of I-680. A research, development, and on-line product sales campus is located on Sunol Boulevard to the east of I-680. Employees and patrons of commercial establishments would have short duration views of the highway and moderate to low levels of sensitivity to project features because they are focused on their business and purpose for being in the commercial area and because of intervening topography and vegetation.
- *Local Streets.* Motorists and bicyclists using local street crossings of I-680 each day have short-durations of exposure to views of the highway and low levels of sensitivity to project features added to I-680. Pedestrians on local streets would have moderate duration of exposure because of their slower pace while walking, but would have low levels of sensitivity because streets below or above the highway are noisy, vibrate from vehicles, and in general are not areas where pedestrians linger to view scenic resources or look at the highway.

2.1.8.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect the visual character or quality of the project area.

Build Alternative

Visual Impacts From Key Views

Because it is not feasible to analyze all the views in which the proposed project would be seen, the VIA selected a number of key views associated with the visual assessment units that would

most clearly demonstrate the change in the project's visual resources. A total of six key views were selected. The key views were determined based on their ability to demonstrate the change in the project's visual resources and to represent the viewer groups with the highest potential to be affected by the project considering their exposure and sensitivity. Figure 2.1.8-1 shows the locations and directions of the key views with the overall project area marked in red.

Figures 2.1.8-2a through 2.1.8-7b show existing conditions and simulated views of post-construction conditions for the six key views.

The precise locations and appearance of project components described in this section are based on the preliminary project design and are subject to change. The descriptions and simulated views of post-construction conditions are representative of project-related changes within each landscape unit.

LANDSCAPE UNIT A - I-680 FROM PALOMA WAY TO SUNOL BOULEVARD

KEY VIEW (KV) 1- FROM KOOPMAN ROAD LOOKING SOUTH AT I-680

KV-1 Existing Condition

Key View 1 is a vantage point on Koopman Road looking south toward I-680. Koopman Road parallels I-680 to the east. The location of the vantage point is approximately 1.21 miles north of the SR 84/I-680 interchange and approximately 1.28 miles south of Verona Way. The landscape is rural and hilly, characterized by grasslands to the east and oak woodlands to the west. Ridges and Mission Peak are visible to the south. Beyond I-680 to the west, densely screened large-parcel single-family residences in the vicinity of Foothill Road are partially visible on the slopes of the hills. I-680, with pavement, vehicles and vehicle lights, is visible west of Koopman Road. There are no highway signs or lights in the view. Steel post and wire fencing are on both sides of Koopman Road.

KV-1 Viewer Response

The memorability of View 1 is high, sharing the same striking vistas of rural landscape, distant ridges, and Mission Peak as I-680, an Officially Designated State Scenic Highway. The intactness of the view is moderate-high. Structures are limited, confined to the ground level and partially screened. There are no structures encroaching upon views within the horizon. The balance between structures and natural features is high, with transportation corridor features in the center and rural hillsides and oak woodlands to the east and west. At night, light from vehicles on I-680 and Koopman Road is visible. Otherwise, nighttime views of the horizon and outlines of the distant ridges are striking, contributing to the high quality of views from the



Figure 2.1.8-1: Key View Location Map

vantage point on Koopman Road. The overall level of viewer response to views in the existing condition is high.

KV-1 Resource Change

Two VTMS signs, one facing the northbound lanes and one facing the southbound lanes of I-680, would be in place with the proposed project. The sign facing the southbound lane would be added by the SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 29763), which is anticipated to open to traffic in 2023, two to three years before the proposed project would open. The signs would be located in the median approximately 300 feet south of the View 1 vantage point. As part of this project, toll readers would be mounted on the bottom of each gantry facing downward. In addition, a highway light would be mounted on each sign approximately 10 feet above the top of the sign. The total height of the sign structures plus lights would be approximately 44 feet above the highway pavement level. The approximate 13-foot-high by 29-foot-long sign plate of each sign would be mounted on the eastern and western halves of an approximate 100-foot-long by 9-foot-high steel trestle gantry in a butterfly arrangement. The total width of the sign structure would be approximately 100 feet. During the hours of HOV/express lane operation,⁶ the electronic message sign would display the toll pricing for the express lane system. The prices displayed would change depending on the level of congestion on the highway. The surface finish on the face of the sign would have reflective properties, enhanced by headlights of oncoming vehicles shining on the surface.

The signs and lights would be visible from the vantage point on Koopman Road. The memorability of View 1 would be moderate with the addition of the two signs, lights and readers in the view. The sign structures, lights and readers would be visible in the foreground of views of striking scenic resources. The moderate-high level of intactness in the existing view would be diminished to moderate by the intrusion of the signs on the striking views of the natural environment. The unity of the view would be reduced to moderate. The proposed signs would affect the balance between natural features and structures in the view. At night, the lights and reflective sign surfaces would add light and glare to the view.

The resource change with the project would be moderate. The overall level of viewer response to views of the project would be moderate. Visual impacts of the project would be moderate.

⁶ The Bay Area Managed Lanes Committee, composed of Caltrans, MTC, and CHP staff, will decide hours of operations of the HOV/express lanes. Outside of the hours of operation, the HOV/express lanes would be operated as general-purpose lanes, open to all users for no toll, and the VTMS signs would say "Open to all."



Figure 2.1.8-2a: Key View 1, Koopman Road Looking South Toward I-680, Existing Condition

Image courtesy of Google Street View: March 2011



Figure 2.1.8-2b: Key View 1, Koopman Road Looking South Toward I-680, Simulated View

KEY VIEW 2 - FROM HAPPY VALLEY ROAD LOOKING WEST TO I-680

KV-2 Existing Condition

Key View 2 is a vantage point on Happy Valley Road looking west toward I-680. Happy Valley Road is a two-lane local road that goes under I-680 at approximately 387 feet to the west of the vantage point and intersects with Pleasanton Sunol Road. To the east, Happy Valley Road connects to the Callippe Preserve Golf Course. The location of the I-680 overcrossing is approximately 0.20 mile south of the center point of the I-680/Sunol Boulevard Interchange. The landscape is semi-rural and hilly characterized by grasslands and oak woodlands to the east and west. Scenic ridges are visible to the west. Beyond I-680 to the west, densely screened large-parcel single-family residences in the vicinity of Foothill Road are partially visible on the slopes of the hills. To the northeast of the highway, single-family residences are densely screened by vegetation and intervening topography. Golf courses are to the northwest and southeast. I-680, with bridge, columns, edge of highway barriers, vehicles and vehicle lights, is visible to the west of the vantage point. There are no highway signs or lights in the view; however, street lights are present in the neighborhood, including just behind (and outside of) Key View 2.

KV-2 Viewer Response

The memorability of View 2 is moderate-high, sharing the same vistas of rural landscape and distant ridges as I-680, an Officially Designated State Scenic Highway. The intactness of the view is moderate. Single-family residences, sidewalks and roadway pavement, and low fences are within the view. Diminishing the intactness of views of distant scenic ridges and the horizon are utility poles and lines located at the south edge of Happy Valley Road at the overcrossing. The balance between structures and natural features is moderate, with transportation corridor features in the center, ridges in the distance, rural hillsides bordering the western and southern views, and the residential structures to the north. At night, light from vehicles on I-680 and Happy Valley Road is visible. The overall level of viewer response to views in the existing condition is moderate.

KV-2 Resource Change

The project would add one VTMS sign and sign light facing southbound lanes and a trestle gantry with a reader mounted to the bottom rail facing northbound lanes in the I-680 median. The features would be located approximately 475 feet southwest of the vantage point. The total height of the sign structure plus light would be approximately 44 feet above the highway pavement. The approximate 13-foot-high by 29-foot-long sign plate of the VTMS signs would be mounted on the western half of an approximate 100-foot-long by 9-foot-high steel trestle gantry in a butterfly arrangement. The total width of the sign structure plus gantry would be approximately 100 feet. During the hours of HOV/express lane operation, the electronic message sign would display the toll pricing for the express lane system. The prices displayed would change depending on the level of congestion on the highway. The surface finish on the face of the sign would have reflective properties, enhanced by headlights of on-coming vehicles shining on the surface. A toll reader facing downward would be mounted on the bottom of the gantry. The sign and overhead light would be visible from residences on Happy Valley Road adjacent to I-680, although existing trees (which would not be removed by the project) would provide some visual shielding. Views of the night sky would include the addition of new amber-colored

message lights, light from the illuminated sign, and reflections on the sign's surface of headlights of southbound-traveling vehicles on the highway.

The memorability of View 2 would be degraded to moderate with the addition of the sign, gantry, light, and reader in the view. During the day, the highway features would encroach on views of the distant scenic ridges and the horizon. At night, lights and flashes of light from the vehicle headlight reflections on the sign's surface could encroach on views of the dark sky. The intactness of the view would be diminished from moderate to moderate-low, due to the addition of structures within horizon views and in greater part to the addition of lights to the night sky. The balance or unity between natural and man-made structures would be moderate. The structures would be visible in the foreground of views of the distant ridges and the horizon.

The resource change with the project would be moderate. The overall level of viewer response to views of the project would be moderate. Visual impacts of the project would be moderate.

Moving the sign, trestle gantry, and light to the south would avoid or minimize the visual impact at Key View 2 because intervening topography would shield the project features from the residences on Happy Valley Road. During the detailed design phase, these project features will be moved to the south unless infeasible due to highway safety issues or other engineering or environmental constraints.



Figure 2.1.8-3a: Key View 2, Happy Valley Road Looking West Toward I-680, Existing Condition

Photo Date: 2-11-2019



Figure 2.1.8-3b: Key View 2, Happy Valley Road Looking West Toward I-680, Simulated View

LANDSCAPE UNIT B - I-680 FROM SUNOL BOULEVARD TO STONERIDGE DRIVE

KEY VIEW 3 - FROM WEST LAGOON ROAD LOOKING NORTH TO I-680

KV-3 Existing Condition

Key View 3 is a vantage point on West Lagoon Road looking north toward I-680. West Lagoon Road, a two-lane local road, is parallel and approximately 300 feet to the west of I-680. West Lagoon Road intersects with Bernal Road approximately 0.61 mile to the north and intersects with Lagoon Creek Lane approximately 0.05 mile to the south. The landscape is flat and characterized by man-made structures and ornamental vegetation. Ridges are visible to the west. Beyond I-680 to the west are single-family residential communities interspersed with recreational green spaces and public parks. Adjacent to the slopes of the ridges, single-family residences are sparsely located and densely screened by oak woodlands. To the northeast of I-680, the landscape is flat and densely populated with commercial buildings, the Alameda County Fair Grounds, and Bernal Community Park. Densely populated single-family neighborhoods extend beyond the commercial and community facilities to the north, east, and south. No highway structures or vehicles are visible from the vantage point due to intervening topography. There are no existing highway lights in the vicinity of the vantage point, the closest being at the on- and off-ramps of the Bernal Avenue interchange. Street lighting is present along West Lagoon Road.

KV-3 Viewer Response

The memorability of View 3 is high, sharing the same vistas of rural landscape and distant ridges as I-680, an Officially Designated State Scenic Highway. The intactness of the view is moderate-high, diminished by views of single-family residences, sidewalks and roadway pavement, and street lights. The balance between structures and natural features is high, with the residential community in the center, tall ridges to the west and a vegetated tall berm to the east blocking views toward the highway. Beyond the berm there are striking views of the horizon and mountains to the southeast. The overall level of viewer response to views in the existing condition is high.

KV-3 Resource Change

The project would add one overhead express lane VTMS sign and sign lighting facing southbound lanes and a FasTrak Only sign with a reader mounted to the bottom rail facing northbound lanes in the I-680 median. The project features would be located approximately 475 feet northeast of the vantage point. The total height of the sign structures with overhead light would be approximately 44 feet above the highway pavement. The approximate 13-foot-high by 29-foot-long sign plate of the VTMS sign would be mounted on the western half of an approximate 100-foot-long by 9-foot-high steel trestle gantry in a butterfly arrangement and with the FasTrak Only sign mounted on the eastern half of the gantry. The total width of the sign structure including the gantry would be approximately 100 feet. During the hours of operation of the HOV/express lanes, the electronic message sign would display the toll pricing for the express lane system. The prices displayed would change depending on the level of congestion on the



Figure 2.1.8-4a: Key View 3, West Lagoon Road Looking North Toward I-680, Existing Condition

Photo Date: 2-11-2019



Figure 2.1.8-4b: Key View 3, West Lagoon Road Looking North Toward I-680, Simulated View

highway. The surface finish on the face of the sign would have reflective properties, enhanced by headlights of oncoming vehicles shining on the surface. A toll reader facing downward would be mounted on the bottom of the gantry. The sign and overhead light would be visible to residences on West Lagoon Road. The project would add amber-colored message lights, light from above the sign, and reflections on the sign's surface from headlights of southbound vehicles on the highway to views of the night sky. The FasTrak Only sign would display painted times and days of operation and would not include changeable messages using amber-colored lights.

The memorability of View 3 would be diminished to moderate with the addition of the sign, gantry, light and reader in the view. During the day, the highway features would reduce but not dominate views of the horizon from the View 3 vantage point. At night, lights and flashes of light from the vehicle headlight reflections on the sign's surface would encroach on views of the dark sky. The intactness of the view would be diminished to moderate due to the addition of structures on horizon views and in greater part to the addition of lights on the night sky. The balance or unity between natural and man-made structures would be minimally affected by the project features and would be reduced to a moderate-high level.

The resource change with the project would be moderate. The overall level of viewer response to views of the project would be moderate. Visual impacts of the project would be moderate.

KEY VIEW 4 - FROM CENTENNIAL TRAIL LOOKING WEST TO I-680

KV-4 Existing Condition

Key View 4 is a vantage point on Centennial Trail looking west toward I-680. The trail is parallel and approximately 214 feet to the east of I-680. At a total length of 7.8 miles long, the trail parallels Arroyo de la Laguna in Pleasanton. Approximately 400 feet to the north, the trail is accessed from Val Vista Park, a community park surrounded by densely populated single-family residential communities as well as a waste water treatment plant located adjacent to the trail to the north of the entrance to the park, and Donlon Elementary School to the east. The I-680 Stoneridge Drive interchange is approximately 0.54 mile to the north of the vantage point. The landscape is flat and characterized by man-made structures and ornamental vegetation. Mountain ridges are visible to the west. From vantage points on I-680, Mount Diablo and ridges are visible to the east. Beyond I-680 to the west are single-family residential communities interspersed with open green spaces and public parks. Highway structures and vehicles are visible from the vantage point and from second-story windows of single-family residences east of the sound wall separating the residences from the trail and highway. Two small post-top signs and a video-cam on a pole on the highway are visible from the vantage point. There are no existing highway lights or overhead signs in the vicinity of the vantage point, the closest being at the on- and off-ramps of the Stoneridge Drive interchange to the north. Neighborhoods on both sides of I-680 in the area have street lighting. During the day, vehicles on I-680 are in clear view of the trail, and at night, lights from passing vehicles are visible.

KV-4 Viewer Response

The memorability of View 4 is moderate-high, sharing some of the same vistas as from I-680 (an Officially Designated State Scenic Highway), including groves of mature trees and the ridges to the west. The intactness of the view is moderate, diminished by views of vehicles on I-680 and the sound wall to the east. The balance between structures and natural features is moderate, with

the sound wall to the east, creek and grassy slopes through the middle view, lines of vehicles on I-680 to the east of the grassy slopes, and mature trees to the west that draw the focus away from the vehicles on I-680. The overall level of viewer response to views in the existing condition is moderate.

KV-4 Resource Change

The project would add one VTMS sign and overhead light facing southbound lanes and a FasTrak Only sign with a reader mounted to the bottom rail facing northbound lanes in the I-680 median. The features would be located approximately 265 feet northwest of the vantage point. The total height of the sign structure, including the overhead light, would be approximately 44 feet above the highway pavement. The approximate 13-foot-high by 29-foot-long sign plate of the VTMS sign would be mounted on the western half of an approximate 100-foot-long by 9-foot-high steel trestle gantry in a butterfly arrangement and with the FasTrak Only sign mounted on the eastern half of the gantry. The total width of the sign structure plus gantry would be approximately 100 feet. The electronic message sign, which would display toll pricing using amber-colored lights during the express/HOV lane hours of operation, would be facing away from the vantage point. The light above the sign would be visible in the night sky from the vantage point and could be visible to nearby single-family residences to the east of the sound wall. The FasTrak Only sign would display printed times and days of operation and would not include changeable messages.

The memorability of View 4 would be diminished from moderate-high to moderate with the addition of the VTMS sign, FasTrak sign, light and reader in the view. During the day, the highway features would reduce but not dominate the quality of views of the horizon and mature trees from the View 4 vantage point. At night, the light above the VTMS sign would add light in the view and vehicle headlights would be reflected on the faces of both signs. The nighttime light and glare could be visible from second-story windows of nearby residences located to the east of the sound wall. With the project structures added, the intactness of the view during the day would be minimally affected and would remain at a level of moderate. During nighttime hours, few trail users are expected to be present; however, any addition of lighting from the project features could be perceived as providing a safety benefit.

Given the moderate scale of the project features, the mass of mature trees would continue to draw focus away from the addition of the proposed highway structures during the day. The balance or unity between natural and man-made structures would be minimally affected by the project features and would remain at a moderate level.

The resource change with the project would be moderate. The overall level of viewer response to views of the project would be moderate. Visual impacts of the project would be moderate.

Moving the proposed signs and light to the north (between Muirwood Park to the west and the southern part of the wastewater treatment plant to the east) and away from residential development along I-680 would avoid or minimize the visual impact at Key View 4. During the detailed design phase, these project features will be moved to the north unless infeasible due to highway safety issues or other engineering or environmental constraints.



Figure 2.1.8-5a: Key View 4, Centennial Trail Looking West Toward I-680, Existing Condition

Photo Date: 2-11-2019



Figure 2.1.8-5b: Key View 4, Centennial Trail Looking West Toward I-680, Simulated View

LANDSCAPE UNIT C - I-680 FROM STONERIDGE DRIVE TO ALCOSTA BOULEVARD

KEY VIEW 5 - FROM CANTERBURY LANE LOOKING WEST TO I-680

KV-5 Existing Condition

View 5 is a vantage point on Canterbury Lane looking west toward I-680. Canterbury Lane is a two-lane road that connects with Village Parkway and Tamarack Drive in Dublin and serves a densely populated single-family community to the east of I-680. Approximately 0.23 mile to the south, I-680 crosses over Amador Valley Boulevard. Approximately 0.91 mile to the north is the I-680 interchange with Alcosta Boulevard in San Ramon. The landscape is flat valley terrain characterized by densely populated single-family residential communities to the east and west of I-680. Scenic ridges are to the west and Mount Diablo is to the east of the flat valley terrain. Local foothills to the west of I-680 are visible beyond the sound wall to the northwest of the vantage point. There is one illuminated highway sign in the view, an overhead painted mileage sign at the east edge of the highway, approximately 391 feet to the north of the vantage point. Within an approximate 52-foot-wide and sloped landscaped area in the State ROW between the sound wall (at the east edge of I-680) and the rear property lines of the single-family homes on Canterbury Lane, there is dense vegetation consisting of mature trees and shrubs that screen views of the 14-foot-high sound wall with levels of density that vary within individual properties. The landscaped earth embankment in the landscaped area slopes from the rear edge of the private properties up to the base of the sound wall. Utility lines and poles are visible behind rear property lines at the east edge of the landscaped area.

KV-5 Viewer Response

The memorability of View 5 is moderate within the context of a single-family neighborhood whose structures, landscapes, and trees are well-maintained. The intactness of the view is moderate-low. Aside from residential structures that intrude on the natural environment, views of the sound wall at the east edge of the highway, the utility lines and poles along the rear property lines of the single-family residences, the highway mileage sign, and light to the northwest at the east edge of the highway also diminish the level of intactness. In addition, there are utility lines between the utility easement and Canterbury Lane, as well as street lights at the west edge of Canterbury Lane that diminish intactness of the view. The balance between structures and natural features is moderate, with local road pavement bordered by an approximate equal mixture of 85 percent structures to 15 percent landscaping within each property along Canterbury Lane. The overall level of viewer response to views in the existing condition is moderate-low.



Figure 2.1.8-6a: Key View 5, Canterbury Lane Looking West Toward I-680, Existing Condition

Photo Date: 8-10-2019



Figure 2.1.8-6b: Key View 5, Canterbury Lane Looking West Toward I-680, Simulated View

KV-5 Resource Change

The project would widen the highway to the east and the west, remove the existing sound walls, and add new sound walls on top of new retaining walls. On the east side of the highway, visible from the vantage point, the project would remove the existing 14-foot-high sound wall at the east

edge of I-680 and add a 15-foot-high retaining wall with an approximately 15-foot-high sound wall on top in a location 20 feet to the east of the existing sound wall. The total height of the retaining wall plus the sound wall would be approximately 30 feet. The project would remove existing trees and shrubs in the State ROW to accommodate the construction of the walls. In addition, the project would shift the existing overhead mileage sign and light to the new eastern edge of the highway. In the highway median, approximately 296 feet to the northwest of the vantage point, the project would add a box trestle gantry facing northbound lanes with a downward-facing toll reader attached to the bottom rail of the gantry. The total height of the box trestle sign structure would be approximately 20.5 feet above the highway pavement. The dimensions of the box trestle gantry would be approximately 8.3 feet high by 30 feet long. In the photosimulated view, the location of the trestle gantry would be beyond the cone-shaped evergreen tree and not visible from the Key View 5 vantage point.

The memorability of View 5 from the perspective of residents' views toward I-680 would be diminished to a low level with the addition of the combination retaining wall and sound wall, in a location 20 feet closer to the residents' homes and with the removal of the screening vegetation from the State ROW. No vegetation removal on private residential property is proposed. The intactness of the view would be diminished to a low level. Without the vegetation to screen and soften the appearance of the walls, the larger proposed walls would contrast to a greater degree with the existing features in the environment. The shift of the existing overhead sign 20 feet closer to the rear of the residential property would contribute to the diminished intactness in the view. The balance or unity between natural and man-made structures in the view would be reduced to low in the view because the 30-foot-high concrete wall without screening vegetation would be the dominant feature in the rear yard instead of the existing view, which is a combination of concrete masonry wall and screening vegetation. New sound walls and retaining walls would receive aesthetic treatments of color and/or texture similar to adjacent existing treatments along I-680, in order to maintain visual and aesthetic consistency, and where feasible, vines could be planted along soundwalls to reduce visual impacts (Section 2.1.8.4; Measure VIS-2).

The resource change with the project would be moderate-high. The overall level of viewer response to views of the project would be moderate. Visual impacts of the project would be moderate-high.

KEY VIEW (KV) 6 - FROM MILLBROOK AVENUE LOOKING EAST TO I-680

KV-6 Existing Condition

View 6 is a vantage point on Millbrook Avenue looking east toward I-680. A two-lane local road, Millbrook Avenue is one of several spur roads that connect with Vomic Road. Vomic Road connects with San Ramon Road, a local north-south arterial to the west of I-680. The local roads serve densely populated single-family communities to the west of I-680. Approximately 0.55 miles to the south, I-680 goes over Amador Valley Boulevard; and approximately 0.91 miles to the north, I-680 goes under Alcosta Boulevard. The landscape is flat valley terrain characterized by densely populated single-family residential communities to the east and west of I-680. Dublin Elementary School is beyond the row of residences to the south of Millbrook Avenue. Scenic ridges are to the west and Mount Diablo is to the east of the flat valley terrain. On Millbrook Avenue to the east of the vantage point and beyond the sound wall, elevated terrain within Doolan Canyon Regional Preserve (south of Mount Diablo) is visible as well as mature trees that are at the east edge of I-680. There is one FasTrak sign with lighting in the

median of I-680 and one overhead mileage sign at the east edge of the highway, located approximately 241 feet and 318 feet, respectively, to the east of the vantage point. At the end of Millbrook Avenue, a chain link fence cordons off a north-south drainage channel located between the chain link fence and the 14-foot-high sound wall at the west edge of the highway. Utility poles and lines are visible along rear property lines parallel to the east and west edges of I-680. Street lighting is present along Millbrook Avenue.

KV-6 Viewer Response

The memorability of View 6 looking east toward I-680 is low. Views of distant elevated terrain to the east are minimal and horizon views are diminished by the presence of utility poles and lines and highway signs. The intactness of the view is low. Views of the natural environment are diminished by highway and utility structures including chain link fence, masonry sound wall, utility poles and lines and highway signs. The balance between structures and natural features in the view is low. Views of natural features are intruded upon by highway and utility structures in many locations between ground level and within the horizon without a harmonious arrangement. The overall viewer response to views in the existing condition is low.

KV-6 Resource Change

The project would widen the highway to the east, beyond the sound wall in the view. With the widening, a new sound wall plus retaining wall would be added at the east edge of I-680 and existing mature trees and shrubs that are visible beyond the sound wall in the view would be removed. The existing overhead mileage sign at the east edge of I-680 would be shifted to the new edge of highway. The existing FasTrak sign and light in the median would be removed. A VTMS sign and light facing northbound lanes would be added to the median approximately 70 feet to the north of the removed FasTrak sign. A VTMS sign, light, and reader facing southbound lanes would be added to the median approximately 150 feet to the north of the removed FasTrak sign. The total height of each VTMS sign structure plus light fixture would be approximately 44 feet above highway pavement level. The approximately 13-foot-high by 29-foot-long sign plate would be mounted on the western or eastern half of an approximate 50-foot-long by 9-foot-high steel trestle gantry. The total width of the sign structure would be approximately 50 feet. The electronic message sign would display the toll pricing for the express lane system. The prices displayed would change depending on the level of congestion on the highway. The surface finish on the face of the sign would have reflective properties, enhanced by headlights of on-coming vehicles shining on the surface.

The memorability of View 6 looking east toward I-680 would remain low and would be diminished with the addition of highway signs and lights in the median and the removal of mature trees to the east of I-680. The intactness of the view would remain low and would be diminished by the addition of more sign and light structures in views of the horizon. The balance or unity between natural and man-made structures in the view would remain low and be diminished with the addition of structures, further degrading the balance of natural and structural features in the view.



Figure 2.1.8-7a: Key View 6, Millbrook Avenue looking east toward I-680, Existing Condition

Photo Date: 8-10-2019



Figure 2.1.8-7b: Key View 6, Millbrook Avenue looking east toward I-680, Simulated View

The resource change with the project would be moderate-high. The overall level of viewer response to views of the project would be moderate-high. Visual impacts of the project would be moderate-high.

Moving the proposed signs and lights approximately 180 feet to the north (between Millbrook Avenue and Cavalier Lane) where there is some intervening screening vegetation within residential properties could avoid or minimize the visual impact at Key View 6. During the detailed design phase, the project signs will be moved to the north unless infeasible due to highway safety issues or other engineering or environmental constraints.

Impact Summary

Table 2.1.8-1 summarizes and compares the narrative ratings for visual resource change, viewer response, and visual impacts between alternatives for each key view.

Table 2.1.8-1: Summary of Key View Narrative Ratings for the Build Alternative

Visual Assessment (Landscape) Unit	Key View	Resource Change	Viewer Response	Visual Impact
A	1	Moderate	Moderate	Moderate
A	2	Moderate	Moderate	Moderate
B	3	Moderate	Moderate	Moderate
B	4	Moderate	Moderate	Moderate
C	5	Moderate-High	Moderate	Moderate-High
C	6	Moderate-High	Moderate-High	Moderate-High

The Build Alternative would affect views of scenic resources. Scenic resources in the project include Mount Hamilton, Mission Peak, the Maguire Peaks, Pleasanton Ridge, and Apperson Ridge to the south and Mount Diablo and ridges to the north. Scenic resources also include hills and ridges to the east and west of I-680, as well as vegetation at the edges of the highway including mature trees, screening vegetation and grassy hillsides. The mountains and ridges to the north and south are viewed through the highway corridor in the horizon.

Views of scenic resources would be altered to varying degrees by project features including the addition of HOV/express lane signs, poles, and lights in the median of I-680; the addition of pavement toward the median and outside edges for the HOV/express lanes; the removal of vegetation to accommodate highway widening; the widening of existing bridges; and the addition of retaining walls and sound walls. In addition, features would be added by the project that would not affect views of scenic resources. Such features would include equipment cabinets, grassy biofiltration areas, maintenance vehicle pullouts, CHP enforcement areas, and concrete barriers.

Viewer response to the addition of project features would vary from low to high depending on the duration of their exposure, their level of sensitivity to project features, and the type of change or project feature being added to their view. Neighboring residents have higher sensitivity to project features due to higher levels and longer durations of exposure to the features. Highway motorists have moderate to high levels of exposure and sensitivity to project features. Attendees of schools and churches, users of recreational facilities, travelers on local roads that cross I-680, and employees and patrons of commercial areas, all have relative short durations of exposure and moderate to low levels of sensitivity to project features. Residential occupants adjacent to and

overlooking the project corridor would be the most-affected highway neighbors due to the higher duration of exposure and higher sensitivity.

Of the project features proposed, the VTMS signs would most affect neighboring residents because they are large, have illuminated and changeable messages, and the sign surface reflects vehicle lights. Highway and sign lights added to views of the horizon would diminish residents' ability to view the dark night sky. Where VTMS signs are added and adjacent residents have direct unobstructed views from windows or outdoor areas of frequent use, residents may experience moderate to moderate-high visual impacts. Residents adjacent to relocation of combination retaining walls and sound walls, such as the single-family residences on Canterbury Lane, may also be affected at high levels because the walls are taller (by 1 foot) and closer to their homes than existing walls, and because existing screening vegetation would be removed.

Motorists on I-680 would be affected at moderate levels by the addition of express lane signs in the highway median because the signs would be visible in the foreground of their views of scenic mountains and ridges. Motorists' and residents' views of the dark night sky would be diminished with the addition of highway and sign lights and the reflective surfaces of the express lane signs. Highway motorists would be directly exposed to project features; however, the duration of exposure would be brief, limited to only the short time it would take to drive past these features.

The overall visual resource change and visual impact of project features would be moderate.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1). The project components on southbound I-680 represented by Key Views 3 and 6 would be constructed with Phase 1. The overall visual effects of Phase 1 would be consistent with those of the full Build Alternative.

Impacts to Officially Designated State Scenic Highway

I-680 within the project limits is an Officially Designated State Scenic Highway and is subject to the five elements required for Scenic Highways, listed in Section 2.1.8.1. The Build Alternative would not convert existing land uses along I-680 or intensify existing or proposed development, as discussed in Section 2.1.4.3.

The new HOV/express lane signs that the project would add to I-680 in the project limits are standard throughout the San Francisco Bay Area, with overhead roadway signs currently installed or under construction on I-680 to both the north and south of the project area and on I-580 to the east. In Landscape Unit A, the proposed overhead signs would block or overlap portions of the views of distant scenic resources for motorists traveling the corridor. The section of I-680 south of Sunol Boulevard has curves and elevation changes that would partially or wholly obstruct long-duration views of project signs for motorists. Blockage of views would be of short duration while passing each sign, and the signs would not completely obstruct views of the surrounding and distant hills and landforms. The repeated visual intrusion caused by the proposed HOV/express lane signs would affect views of distant scenic resources, but the impact would not be substantial and adverse.

Temporary Construction Visual Impacts

The assessment of construction-related visual impacts is based on available preliminary plans and from construction methods that are generally employed for a project of this type, as final design documents and construction staging plans were not available at the time of analysis.

During project construction, viewers would see materials, equipment, workers, and construction operations, including trenching, excavations, dust, placement of temporary roadside barriers, construction signage, night lighting, contractor yards, new pavement, and new structures being constructed. Impacts of construction would be unavoidable but temporary. Motorists and pedestrians would be exposed to construction activities while passing through the construction zone. Residents of adjacent homes would be exposed to construction activities on a more continuous basis. Short-term impacts would include removal of some highway screening vegetation that would be replaced according to Caltrans policy. Long-term impacts would occur where insufficient right-of-way and/or sight distance requirements would not allow for planting trees that were removed during construction.

2.1.8.4 Avoidance, Minimization, and/or Mitigation Measures

Measure BIO-4 (Section 2.3.1.3) provides for replanting native species within riparian areas, and coast live oaks and valley oaks in oak woodlands (including uplands), at a 3:1 ratio. In addition, the following avoidance and minimization measures will be implemented.

VIS-1. Vegetation Removal Measures

- Minimize the removal of groundcover, shrubs and mature trees to the maximum extent possible, utilizing open areas for contractor staging/storage areas.
- Protect existing vegetation outside the clearing and grubbing limits from the contractor's operations, equipment and materials storage.
- Place high visibility temporary fencing around vegetation to be protected before roadway work begins.
- Provide truck watering of vegetation when automated irrigation is interrupted by construction.

VIS-2. Highway Replacement Planting

- Replace removed shrubs and trees at a minimum 1:1 replacement ratio. Some native trees would have a replacement ratio of 3:1.
- Fund required planting through the parent roadway contract to be completed as a separate contract within 2 years of roadway completion, with a 3-year plant establishment period, unless estimated cost is below \$300,000 (which would have a 1-year plant establishment period).
- Where feasible, vines could be planted along sound walls to reduce visual impacts, potential for glare and reduce the incidence of graffiti.

VIS-3. Revegetation Planting: Grasses. All disturbed areas shall receive hydroseeded treatment of erosion control grasses, and if appropriate, locally native grasses.

VIS-4. Aesthetic Treatments

- The design and color treatment for the new overhead sign structures, gantries, VTMS signs and light standards shall be similar to the existing adjacent structures and poles, so to be visually compatible and consistent with the existing installations along the corridor.
- New concrete safety barriers and retaining walls should match the aesthetics (color, pattern and/or texture) of the existing barriers/walls along corridor visual consistency.
- Treatments of color, pattern and/or texture are required in order to reduce visual impacts, glare and the possible incidence of graffiti.

VIS-5. Construction Impact Measures

- Place unsightly materials, equipment storage and staging so that they are not visible within the foreground of the highway corridor to the maximum extent feasible. Where such siting is unavoidable, material and equipment shall be visually screened to minimize visibility from the roadway and nearby sensitive off-road receptors.
- Revegetate all areas disturbed by construction, staging and storage per Measures VIS-1 through VIS-3.
- Limit all construction lighting to within the area of work and avoid light trespass through the use of directional lighting and shielding as needed.

VIS-6. Additional Construction Impact Measures

- Any roadside vegetation and irrigation systems that are damaged or removed during project construction shall be replaced according to Caltrans policy and highway landscaping standards.
- When trenching for utilities, avoid trenching within drip lines of trees and screening shrubs. Directional drilling that would avoid damaging root systems of established plant material shall be used, when reasonable, as opposed to open trenching to install new conduit in places where work within the drip line would be required. Trees and screening shrubs shall be protected from damage during construction.
- Provide highway planting within Caltrans right-of-way where feasible to screen residential views of proposed express lane signs and lights. Caltrans safety-setback requirements would apply for all plantings within State right-of-way.
- Attach all electronic toll readers to sign gantries.
- Incorporate aesthetic features to lessen visual impacts.

VIS-7. During the detailed design phase, consider topography, visual screening, and adjacent development in the placement of overhead signs, trestle gantries, and sign lighting to minimize visual impacts to residents along the project corridor. Adjust locations of project features where

feasible given highway safety standards and other engineering and environmental considerations.

With implementation of Measures VIS-1 through VIS-6, mitigation measures would not be required to address potential visual impacts of the project.

2.1.9 Cultural Resources

2.1.9.1 Regulatory Setting

The term “cultural resources” as used in this document refers to the “built environment” (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including “historic properties,” “historic sites,” “historical resources,” and “tribal cultural resources.” Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act 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 (NRHP). Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 CFR 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) among FHWA, the ACHP, the California SHPO, and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the ACHP’s regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. FHWA’s responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 USC 327).

Historic properties may also be covered under Section 4(f) of the USDOT Act, which regulates the “use” of land from historic properties (in Section 4(f) terminology—historic sites).

CEQA requires the consideration of cultural resources that are historical resources and tribal cultural resources as well as “unique” archaeological resources. PRC Section 5024.1 established the California Register of Historical Resources and outlined the necessary criteria for cultural resource to be considered eligible for listing in the California Register of Historical Resources and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(i). In 2014, AB 52 added the term “tribal cultural resources” to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a California Register of Historical Resources or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires Caltrans to inventory state-owned structures in its rights-of-way. Procedures for compliance with PRC Section 5024 are outlined in a Memorandum of Understanding between Caltrans and SHPO, effective January 1, 2015. For most Federal-aid Projects on the State Highway System, compliance with the Section 106 PA will satisfy the requirements of PRC Section 5024.

2.1.9.2 Affected Environment

The following discussion is from the *Historic Property Survey Report* completed for the proposed project in January 2020 (Archaeological/Historical Consultants 2020a).

The study area for cultural resources is the archaeological and architectural Area of Potential Effects (APE), which encompasses all areas within the physical footprint of the improvements proposed for the Build Alternative as well as areas that may either be directly or indirectly affected by project construction activities.

The archaeological APE consists of the existing Caltrans ROW along with parts of private properties where temporary construction easements are proposed. The architectural APE encompasses the archaeological APE and generally includes the entirety of the parcels where temporary construction easements are proposed.

The vertical APE represents the maximum vertical extent of project-related activities for the proposed undertaking. The vertical APE varies within the project APE, with excavation depths ranging from 3 to 5 feet for conduit trenching, bioswales, and some retaining wall foundations to up to 55 feet for foundation piles for widened bridge structures.

Records and Archival Review

A cultural resources records search was conducted by the Northwest Information Center of the California Historical Resources Information System, at California State University, Sonoma, for the APE and a 0.5-mile radius. Reports for previous studies were reviewed for the APE and a 0.5-mile radius. Other standard cultural resource inventories and references were also reviewed, including at the Amador-Livermore Valley Historical Society in Pleasanton and the Earth Sciences and Map Library at University of California Berkeley.

One previously recorded resource has been identified in the APE, a prehistoric archaeological site that has been determined eligible for listing in the NRHP. This site is also a historic resource for purposes of CEQA.

Native American Consultation

The Native American Heritage Commission (NAHC) was contacted on April 27, 2018, to request a search of the Sacred Lands File for cultural resources of significance to Native Americans within or near the APE.

The NAHC replied on May 16, 2018, providing a list of tribes with traditional lands or cultural places located within Alameda County. On October 11, 2018, preliminary project information and maps were sent to Native American groups via e-mail and U.S. Mail. This communication initiated consultation as required under Section 106 of the National Historic Preservation Act and CEQA (PRC Section 21080.3.1 and Chapter 532 Statutes of 2014, also known as California AB 52). Follow-up e-mails were sent on December 4, 2018, to all recipients who had not responded.

Two recipients replied. Representatives of the Ohlone Indian Tribe and the North Valley Yokuts Tribe requested to be informed about project developments and recommended monitoring of the project by Native Americans.

Consultation with Caltrans is ongoing.

Field Survey Results

Accessible portions of the archaeological APE and a 150-foot buffer were surveyed by archaeologists between June and December 2018. A single isolated prehistoric artifact was identified during the survey.

Potential for Presence of Buried Resources

The project would require subsurface disturbance in the form of excavations for retaining walls, bridge abutments, foundation piles, HOV/express lane gantry foundations, and utility pole relocation. Previous studies and project vicinity geomorphology were used to develop a model of weighted sensitivity to assess the APE's likelihood to contain buried archaeological deposits. The model indicated that the APE contains areas of high or very high sensitivity for buried archaeological resources.

Because the APE contains areas sensitive for buried archaeological resources, a program of geoarchaeological testing was undertaken in May through August 2019 as a good-faith effort to identify obscured or buried archaeological resources that could be affected by project construction. No cultural resources were found during this subsurface testing.

2.1.9.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect any cultural resources.

Build Alternative

No construction activities would take place in the previously determined eligible site, and no surface deposits related to the site were identified during the field surveys. Therefore, the proposed cultural resources finding for this project is No Adverse Effect with Standard Conditions – Environmentally Sensitive Areas (ESAs), pending review from the Caltrans Cultural Studies Office.

The project would not cause a substantial adverse change to a historical or archaeological resource as defined by CEQA, or affect or use any Section 4(f) historic resource. Please see Appendix A under the heading “Resources Evaluated Relative to the Requirements of Section 4(f)” for additional details.

The Build Alternative would not affect a tribal cultural resource.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.1.9.4 Avoidance, Minimization, and/or Mitigation Measures

CUL-1. 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.

CUL-2. If human remains are discovered, California Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains. The Caltrans Branch Chief of Archaeology shall be notified, and then the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the NAHC, who, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the Branch Chief of Cultural Resources, Archaeology 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.

CUL-3. To ensure avoidance of the previously determined eligible site, the site will be designated as an Environmentally Sensitive Area (ESA) for the duration of the project in accordance with the requirements set forth in the *Environmentally Sensitive Area Action Plan* (Archaeological/Historical Consultants 2020b). The requirements include delineating the ESA on all project plans, conducting a preconstruction meeting with construction personnel to ensure that the ESA is properly understood, and coordinating/monitoring ESA installation by the contractor. In addition, an archaeologist will conduct field reviews of the ESA to ensure that it remains intact and is not compromised.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

2.2.1.1 Regulatory Setting

EO 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 CFR 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

2.2.1.2 Affected Environment

The following discussion is based on the *Location Hydraulic Study Report* (WRECO 2019a) for the proposed project, which was completed in February 2019.

Waterway Crossings

There are 16 named and unnamed creeks and flood control channels that cross the I-680 corridor within the project limits. The project’s receiving water body is ultimately San Francisco Bay, via Alamo Canal, which discharges into Arroyo de la Laguna, which discharges into Alameda Creek. Runoff from the project is either collected or conveyed through a system of tributaries to Alamo Canal and Arroyo de la Laguna. Arroyo de la Laguna crosses I- 680 north of Bernal Avenue in Pleasanton.

Floodplains

Several Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas are near or within the project limits. As determined from FEMA Flood Insurance Rate Maps, Special Flood Hazard Areas Zone AE, AH, and AO and Shaded Zone X floodplains were identified within the project limits. Eleven areas of the project are within FEMA-delineated floodplains (see Figures 2.2.1-1a through 2.2.1-1c).

Zone AE regions represent areas subject to flooding by the 1%-annual-chance flood event determined by detailed method where base flood elevations are provided. Of the 11 floodplain areas that overlap the project area, four are Zone AE. Two of the Zone AE floodplain areas (Line

B-2-1 and Arroyo de la Laguna) are designated floodways. These designated floodways are channels reserved for carrying base flood flows.

Additionally, there are two Zone AH floodplain areas, which are areas within the 1%-annual-chance shallow flooding where average depths are between 1 and 3 feet, usually due to ponding, and for which base flood elevations have been derived through detailed hydraulic analysis at certain locations.

There is one Zone AO floodplain area, which is an area in the 1%-annual-chance shallow flooding where average depths are between 1 and 3 feet, usually due to sheet flow on sloping terrain.

There are four Shaded Zone X areas which represent moderate flood hazards with an annual chance of flooding ranging between 1% and 0.2%. The shaded Zone X floodplains identified within the project area are often not associated with a major flooding source.

Natural and Beneficial Floodplain Values

Areas of the project contain natural and beneficial floodplain values. These areas include special-status species habitat and wetlands and waters of the United States, some of which are in a 1% annual chance floodplain.

2.2.1.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect the floodplains within the project limits.

Build Alternative

The Build Alternative proposes to add 10.9 acres of net new impervious area from the widening of bridges, pavement work for new express lanes, addition of MVPs, and new and replaced retaining walls. Less than 5 acres of net new impervious area would be added to areas that function as existing floodplains. The Build Alternative proposes no work at bridges over waterway crossings that are within floodplains.

Roadway widening is proposed along the outside of the northbound lanes immediately north of the Arroyo de la Laguna crossing. The proposed widening design includes cut and fill grading. This location is adjacent to a Zone AH floodplain and the Arroyo de la Laguna regulatory floodway (Zone AE). Further north, because the elevations of Line J-1's Zone AO floodplain adjacent to I-680 are not known, the proposed widening has the potential to be an encroachment due to fill. The proposed improvements within the floodplain include the outer widening of the roadway and the bridge over Amador Valley Boulevard as well as the construction of retaining walls.

The proposed sound wall on retaining wall (RW-600; north of Amador Valley Boulevard) on southbound I-680 adjacent to the Line J-1 channel was considered for the potential of having impacts on the Zone AE floodplain due to placement of fill. However, the fill associated with the placement of the walls would not encroach on the channel or be within the inundation elevations. Therefore, the proposed sound wall on retaining wall is not anticipated to increase flooding. The inundations from the base flood are anticipated to be similar to those under existing conditions and are not anticipated to have the potential for additional traffic interruptions caused by flooding.

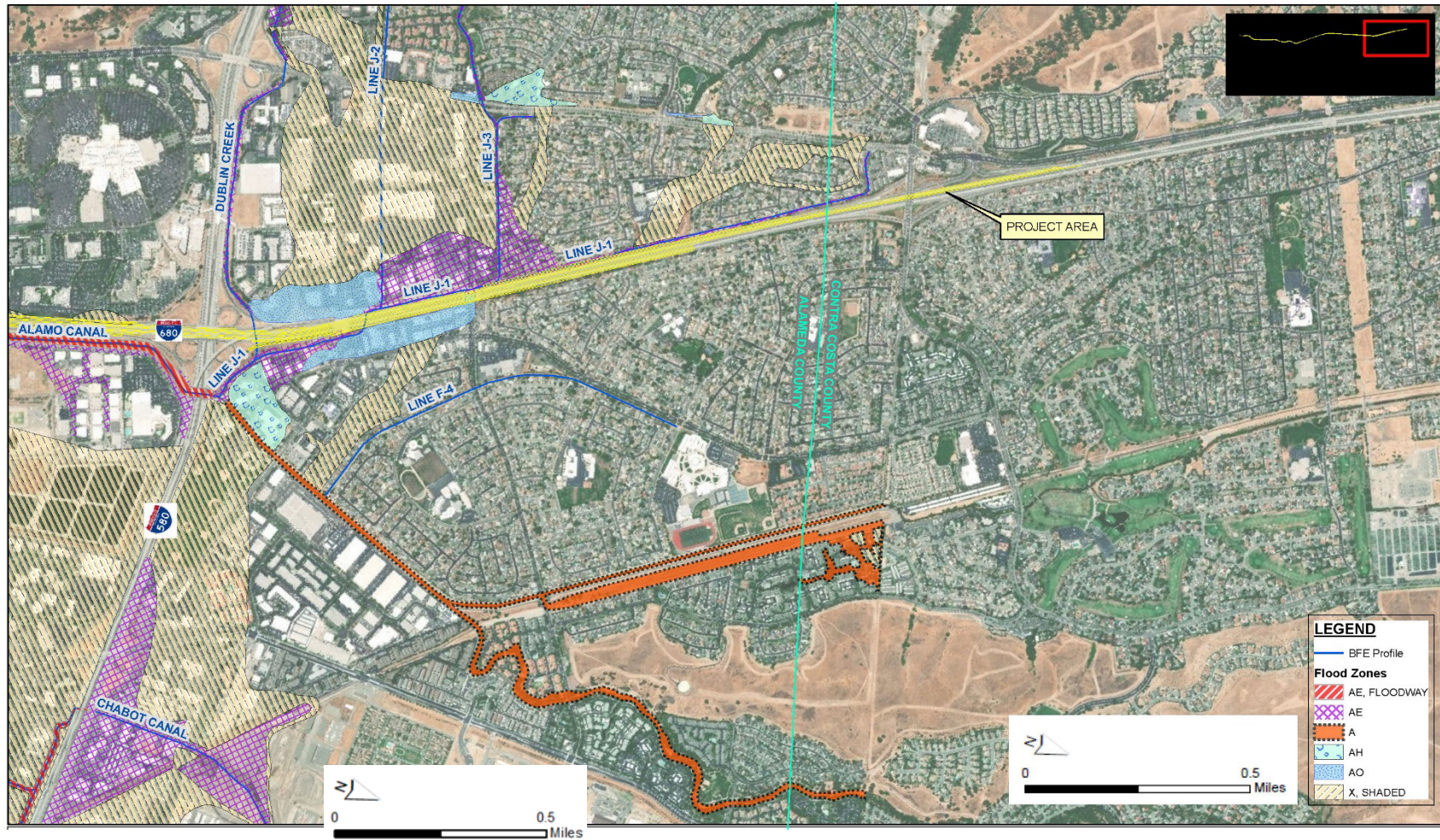


Figure 2.2.1-1a: Aerial view of FEMA Flood Zones along I-680 in the Northern Section of the Project

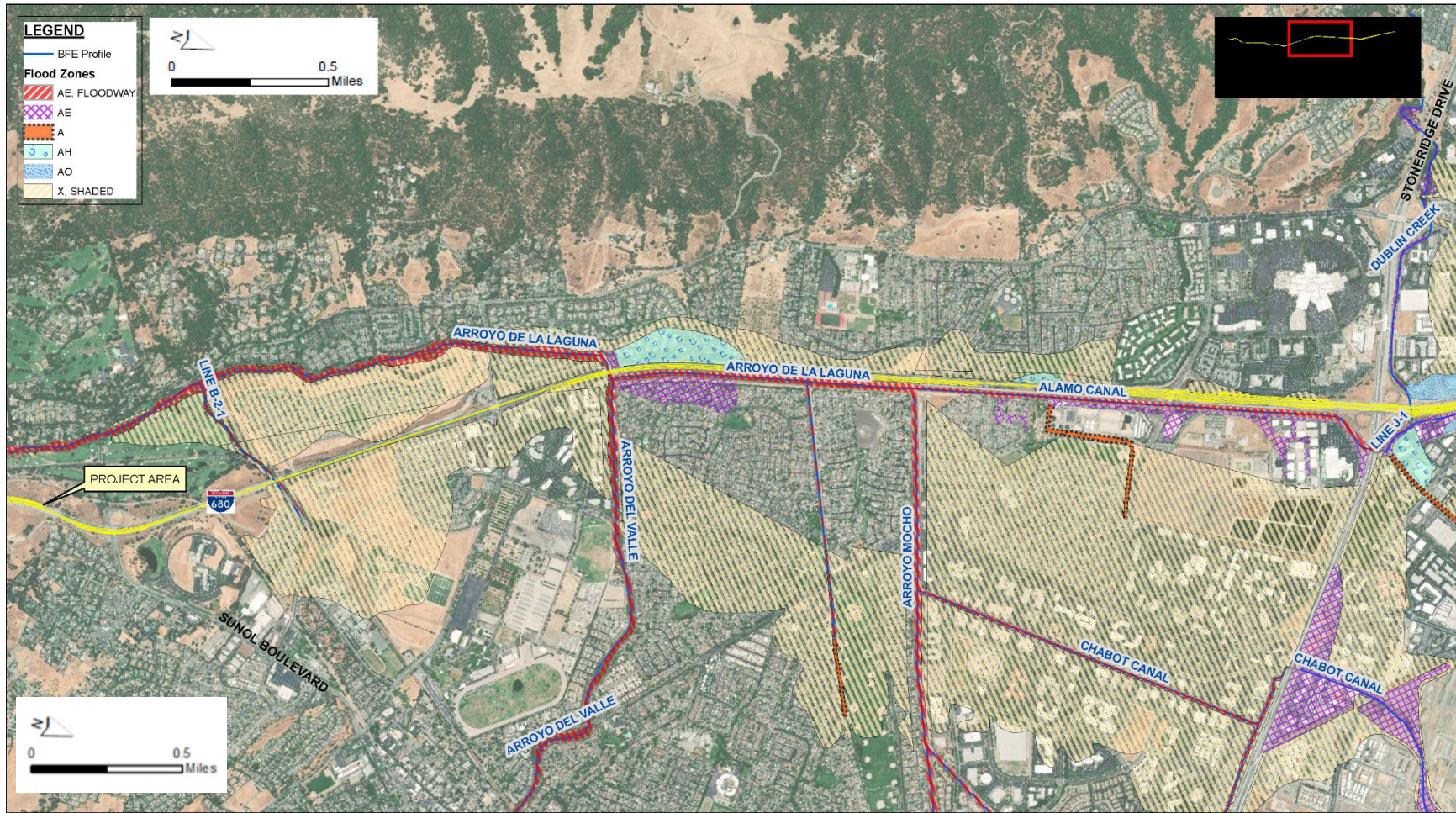


Figure 2.2.1-1b: Aerial view of FEMA Flood Zones along I-680 in the Central Section of the Project

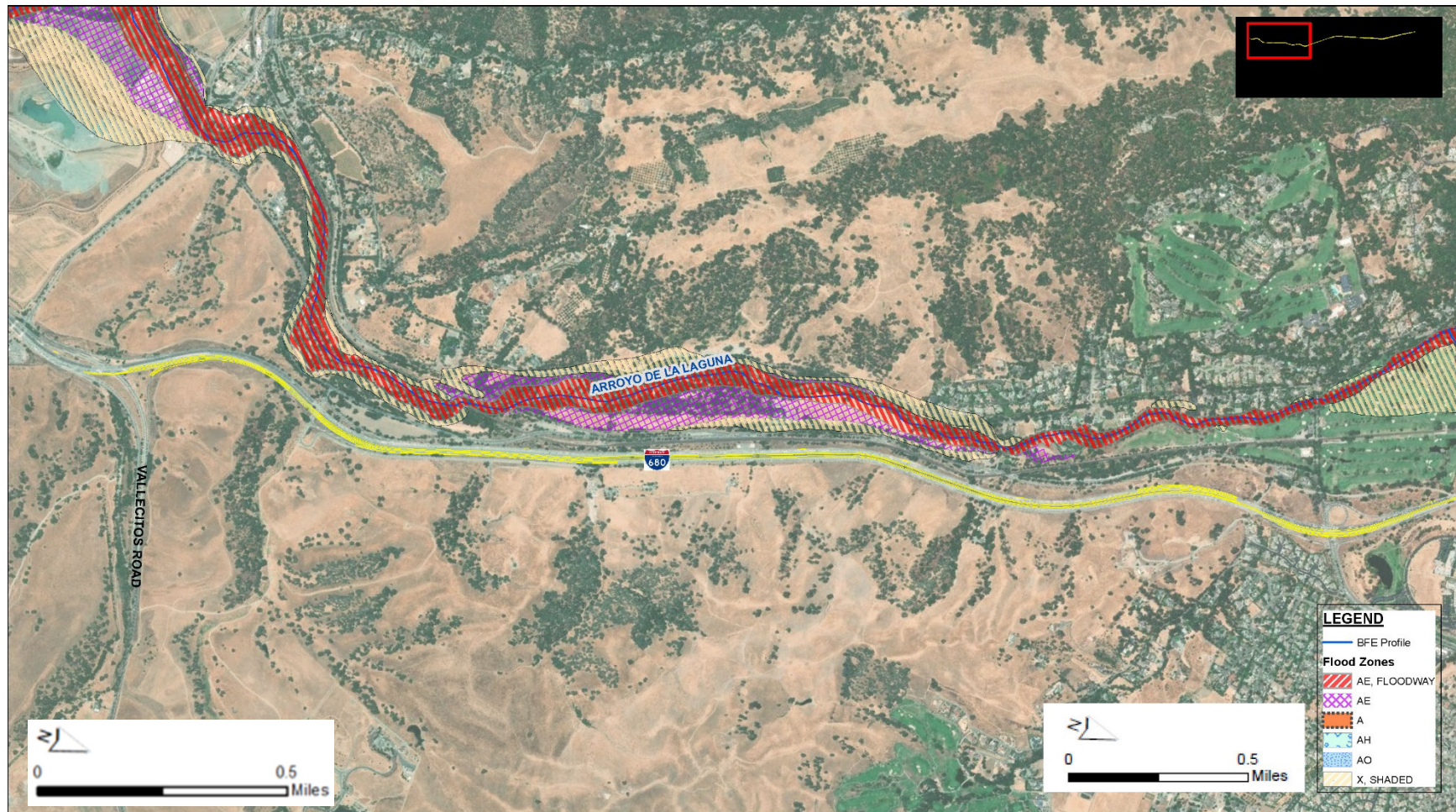


Figure 2.2.1-1c: Aerial View of FEMA Flood Zones along I-680 in the Southern Section of the Project

Longitudinal Encroachment

The FHWA defines a longitudinal encroachment as an action within the limits of the base floodplain that is longitudinal to the normal direction of the floodplain. That is, a longitudinal encroachment is an encroachment that is parallel to the direction of water flow. For instance, a location where a highway runs along the edge of a river, when the river swells and floods, it is likely to flood the highway. In this example, the highway is encroaching into the floodplain of the river, so the highway would be considered a longitudinal encroachment.

Line B-2-1, Line J-1, and Arroyo de la Laguna all cross the project transversely. Line J-1 and Arroyo de la Laguna also have reaches that flow parallel to the project. Alamo Canal only flows parallel to the project and does not cross the project, but is the receiving water body of some of the project's transverse crossings. No proposed project improvements encroach on the longitudinal reaches of Arroyo de la Laguna or Alamo Canal. However, project improvements are proposed in the three Line J-1 base floodplains near the project's northern limits. The proposed actions within these floodplains include outside widening of the roadway, construction of retaining walls topped by sound walls, and two undercrossing bridge widenings. However, these project improvements are expected to occur above and outside of the floodplains and therefore would not encroach on the floodplains longitudinally. The impacts on these floodplains from the proposed work are anticipated to be minimal and would not result in an increased chance of flooding.

Risks of the Action

The project would not result in risks associated with hydrology and floodplains.

Natural and Beneficial Floodplain Values

The project impacts to waters of the U.S., wetlands, and culverts are anticipated to be minimal, as described in Section 2.3.2.3, and the functions and values associated with these features will not be diminished. Therefore, the Build Alternative would not affect the natural and beneficial floodplain values.

Incompatible Floodplain Development

The proposed project will follow the existing I-680 highway within the project limits and will not create new access to developed or undeveloped land in the flood zone. Therefore, the project will not support incompatible floodplain development.

Measures for Floodplain Impacts/Values

No measures are needed to minimize floodplain impacts or to preserve/restore beneficial floodplain values.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.2.1.4 Avoidance, Minimization and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

2.2.2 Water Quality and Storm Water Runoff

2.2.2.1 Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source unlawful unless the discharge complies with an NPDES permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the RWQCBs administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the USACE.

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE’s Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with United States Environmental Protection Agency’s (USEPA) Section 404 (b)(1) Guidelines (40 CFR Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the USEPA in conjunction with the USACE and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that

a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause “significant degradation” to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the least environmentally damaging practicable alternative determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements

Porter-Cologne Water Quality Control Act

California’s Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a “Report of Waste Discharge” for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of “waste” as defined, and this definition is broader than the CWA definition of “pollutant.” Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect those uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or nonpoint source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, nonpoint, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System (NPDES) Program

Municipal Separate Storm Sewer Systems (MS4)

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including MS4s. An MS4 is defined as “any conveyance or system of

conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water.” The SWRCB has identified Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans MS4 permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans MS4 Permit, Order No. 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order No. 2014-0006-EXEC (effective January 17, 2014), Order No. 2014-0077-DWQ (effective May 20, 2014) and Order No. 2015-0036-EXEC (conformed and effective April 7, 2015) has three basic requirements:

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the State to effectively control storm water and nonstormwater discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) BMPs to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Caltrans for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices the Caltrans uses to reduce pollutants in storm water and nonstormwater discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit, Order No. 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a DSA of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction

sites are required to develop SWPPPs; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with Caltrans SWMP and Standard Specifications, a Water Pollution Control Program is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will comply with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

2.2.2.2 Affected Environment

This section is based on the *Water Quality Assessment Report* (Horizon 2019), which was completed in March 2019.

Surface Water Resources

The majority of the project area is in the Arroyo de la Laguna and South San Ramon Creek watersheds (HUC 12). A small portion of the project area crosses the Lower Arroyo Mocho and Upper Alameda Creek watersheds (HUC 12) (Horizon 2018). Natural drainage occurs from the hills toward San Francisco Bay via Alameda Creek; however, the natural hydrology of the watershed areas has been altered by water supply activities and by development and flood control. Alameda Creek is usually a perennial stream in the upper parts of the watershed, but in the Sunol Valley and other alluvial flats, a high rate of infiltration typically results in a dry creek bed during the summer months (San Francisco Planning Department 2005).

The study area has a Mediterranean climate characterized by cool, wet winters and hot, dry summers. Average temperatures range from a low of 37 degrees Fahrenheit (°F) in January to a high of 89°F in July. Average annual precipitation is approximately 14 inches, with most of the precipitation occurring from November through April (Horizon 2018).

The project area is parallel and adjacent to Arroyo de la Laguna on the eastern side of the Sunol and Pleasanton ridges. Both Arroyo Mocho and Arroyo del Valle converge with Arroyo de la Laguna near to the study area. The downstream-most point of Arroyo de la Laguna within the study area has a drainage area of about 412 square miles. Arroyo de la Laguna flows into Alameda Creek, which flows east through Niles Canyon to San Francisco Bay. Tributaries into Arroyo de la Laguna and Alameda Creek flow through the study area. These streams include Dublin Creek, South San Ramon Creek, Gold Creek, Tehan Creek, Arroyo de la Laguna, Vallecitos Creek, Happy Valley Creek, Laurel Creek, Sheep Camp Creek, and several unnamed intermittent streams (WRECO 2018; Horizon 2019).

Both Alameda Creek and Arroyo de la Laguna are 303(d) listed waterbodies and are impaired for diazinon, an organophosphate used in pest control. The USEPA has approved a TMDL for diazinon. Diazinon concentrations in urban creeks are not to exceed 100 nanograms per liter (ng/L) as a 1-hour average. This target addresses both acute and chronic diazinon-related toxicity. The TMDL is allocated to all urban runoff, including urban runoff associated with MS4s, Caltrans facilities, and industrial, construction, and institutional sites (RWQCB 2017).

The San Francisco Bay Basin Plan establishes water quality objectives for all surface waters in the San Francisco Bay Region and specific objectives for Alameda Creek and its tributaries.

Existing beneficial uses for the tributaries and receiving water bodies include agricultural supply; groundwater recharge; commercial and sport fishing; contact and noncontact recreation; and support of biological resources, such as cold and warm freshwater habitat; rare, threatened, or endangered species; migration; spawning; and wildlife habitat.

Groundwater Resources

The project is in the San Francisco Bay Hydrologic Region, which has 28 identified groundwater basins. Although the southern portion of the project is within the Sunol Valley Groundwater Basin, which covers over 16,000 acres, the majority of the project is within the Livermore Valley Groundwater Basin, which covers an area of 65,000 acres. Groundwater makes up 20 to 25 percent of the water supplied by Zone 7 of the Alameda County Flood Control and Water Conservation District (which has its own Board of Directors and is known as Zone 7 Water Agency) to its retail water supply agencies, which include the City of Pleasanton, the DSRSD, the City of Livermore, and California Water Service Company. Additional supply comes from imported surface water from the State Water Project and local runoff into Lake Del Valle. Zone 7 Water Agency manages regional water supplies, including the Livermore Valley Groundwater Basin, and defines groundwater extraction goals for major regional pumpers. It also operates local flood control and recharge facilities to optimize instream recharge. The annual average natural recharge into the groundwater basin is approximately 13,400 acre-feet per year. Zone 7 Water Agency artificially recharges the basin with additional surface water supplies by releasing water into the Arroyo Mocho and Arroyo Valley (Zone 7 Water Agency 2005).

Groundwater elevations in the project vicinity range from about 380 feet North American Vertical Datum of 1988 near Alcosta Boulevard to about 210 feet North American Vertical Datum 1988 near the SR 84/I-680 interchange. Depth to groundwater in the project vicinity generally ranges from about 5 to 20 feet below ground surface (bgs) but can reach 40 feet below ground (Baseline 2018a). A review of the regional topography, surface water hydrology, and groundwater elevations indicates that groundwater flows east toward the project area from the

hills to the west, and then south along the project alignment toward the SR 84/I-680 interchange. Local groundwater elevations and flow directions are affected by seasonal rainfall, the facultative sludge lagoons near the I-680/I-580 interchange, and pumping activities at nearby reservoirs.

In general, groundwater quality throughout most of the Main Basin of the Livermore-Amador Valley Groundwater Basin is suitable for most types of urban and agriculture uses with some minor localized water quality degradation (Zone 7 Water Agency 2005). The primary constituents of concern are high total dissolved solids (or hardness), nitrate, boron, and organic compounds. In the western Main Basin, groundwater is a calcium-magnesium-bicarbonate water type and has historically been considered “hard.” Rising salinity is primarily associated with the saline fringe basin shallow groundwater flowing into the basin or flowing into recharging streams. Trace amounts of boron are present in the eastern fringe basins and in shallow groundwater in the northern fringe basins. The northern extent of the Livermore-Amador Valley is dominated by a sodium rich water, while much of the western part of the basin near Pleasanton has a magnesium-sodium characteristic. The area along the eastern portion of the basin, beneath the Livermore area, has magnesium as the predominant cation.

Impairments include boron concentrations, nitrates, methyl tertiary butyl ether, and gasoline components in a handful of wells. There are five fuel contamination sites within 2,000 feet of a municipal supply. Chlorinated organic solvent releases to soil and groundwater are an issue in the region, primarily in fringe basins and upper aquifers.

2.2.2.3 Environmental Consequences

No Build Alternative

Short-Term (Construction) Impacts

No short-term water quality impacts would occur with the No Build Alternative.

Long-Term (Permanent) Impacts

The No Build Alternative would not result in new construction or improvements other than projects that have already been programmed. The No Build Alternative would not result in long-term water quality impacts.

Build Alternative

Short-Term (Construction) Impacts

The Build Alternative has an estimated DSA of 75.42 acres. Temporary impacts to water quality may result from clearing and grading, excavation for installation of foundations for sign posts, retaining walls, sound walls, and reconstructed bridges; the operation of construction equipment; and temporary storage of materials. These activities could generate polluted runoff, such as sediment-laden runoff from excavations or hazardous materials leaking from construction equipment, that has potential to enter local receiving waters. Because of the sediment risk during construction, the Build Alternative has been classified as Risk Level 3 (Risk levels are described in Section 2.2.2.1).

The Build Alternative has potential to result in short-term impacts related to the chemical and biological characteristics of the aquatic environment, including sedimentation of creek substrates; temporary redirection of drainage patterns; increased turbidity; discharges of oil,

grease, and chemical pollutants related to construction activities; culvert extensions; and increased litter related to construction activities.

Although the temporary impacts from soil disturbance and the operation of construction equipment have the potential to negatively impact water quality, construction site BMPs for erosion and sediment control and material management, as specified in the required SWPPP (described in Section 1.4.1.5), would be used during construction to avoid or reduce impacts. These measures are consistent with the practices required under the Construction General Permit and the Caltrans existing MS4 permit and are intended to achieve compliance with the requirements of the permits. Therefore, compliance with the requirements of these permits, and adherence to their conditions, will reduce or avoid construction-related impacts to water quality.

The Build Alternative has the potential to encounter groundwater during construction of footings for structures and retaining walls that involve deep excavation. During construction, groundwater would be handled following Caltrans' *Field Guide to Construction Site Dewatering* (2014b) and Caltrans Standard Specifications. Following the guidelines and specifications will be required of the construction contractor to avoid adverse impacts.

Long-Term (Permanent) Impacts

The Build Alternative would create 10.87 acres of net new impervious area and 35.47 acres of replaced impervious surface, for a total of 46.34 acres of new and reconstructed impervious area, with the potential to impact water quality. The increase of impervious area has the potential to result in an increase in pollutant concentrations from highway runoff in downstream flows and increased velocity, volume, and temperature of downstream flows. In addition, the added impervious surface has the potential to reduce groundwater recharge near the project area.

Although the Build Alternative would add new impervious area, it would also include storm water treatment facilities to reduce the potential for negative long-term impacts from polluted storm water runoff on receiving water bodies. The project would be designed and implemented to retain, detain or infiltrate runoff and match post-project flows and durations to pre-project patterns for a range of smaller, more frequent rain events, to avoid hydrograph modification impacts. In addition, the project would be designed to meet the trash capture requirements where feasible. With the inclusion of these measures (WQ-2 through WQ-4), the long-term effects of the project would not violate water quality standards or affect the beneficial uses of a water body.

The project area is within a hydromodification susceptible area on the Alameda Countywide Clean Water Program's Hydromodification Susceptibility Map. The following water body crossings have highest risks for hydromodification: Vallecitos Creek, Sheep Camp Creek, and Arroyo de la Laguna (WRECO 2018). The other named water bodies that are contained within flood control channels are considered to be low to moderate risk. Because the low and moderate risk channels all ultimately discharge to Arroyo de la Laguna within 0.25 mile of the project, hydromodification management measures would be included in the design of all storm water discharges to Waters of the State. These measures are required of all projects with the potential to result in hydromodification that require a 401 Water Quality Certification from the RWQCB and is not mitigation. WQ-4 would reduce hydromodification and minimize the risk of water quality impacts from the Build Alternative.

An estimated 37.90 acres of impervious surface can be treated by the identified treatment areas. The goal of the project is to treat the 46.34 acres of post-construction treatment area. Therefore, the project is anticipated to have an 8.44-acre deficit in providing full storm water treatment. The Project Team is continuing to review the project corridor and planned geometry to locate additional treatment opportunities. The Project Team has also reached out to the Cities of Pleasanton, Dublin, and San Ramon for potential partnering opportunities to achieve off-site alternative compliance storm water treatment credit.

If the deficit is not addressed, the RWQCB may not issue a 401 Water Quality Certification for the project. Alternatively, the RWQCB may issue the 401 Certification with the requirement that the deficit will be addressed by alternative compliance for storm water treatment either off-site or by another project in the watershed. The alternative compliance treatment would have to be constructed before or at the same time that the I-680 HOV/express lanes project construction is completed.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following BMPs will avoid or minimize water quality and storm water quality and storm water runoff impacts. The BMPs are incorporated into the project design as a matter of Caltrans standard practices and are not mitigation.

Short-Term (Construction) BMPs

WQ-1: Implement temporary erosion control and water quality measures as required by the Construction General Permit.

Earth-disturbing construction activities should be scheduled to not occur during anticipated rain events. To avoid and minimize any potential sediment laden or contaminated runoff or run-on within the project area, construction site BMPs should be installed before the start of construction or as early as feasibly possible during construction.

Measures to be considered for this project would be detailed during the Plans, Specifications, and Estimates (PS&E) phase. The general construction site BMP strategy for this project consists of soil stabilization (including erosion control/revegetation), sediment control (including temporary fiber rolls, silt fencing, and drainage inlet protection), tracking control (temporary construction entrances/exits and street sweeping), non-stormwater management (including appropriate measures for activities such as dewatering, pile driving, and concrete curing), general construction site management, and stormwater sampling and analysis.

Long-Term (Permanent) BMPs

To address the added runoff volume and intensity from new or modified surfaces as a result of the project, permanent treatment BMPs and pollution prevention BMPs will be developed in detail during the PS&E phase. Caltrans' existing MS4 permit, as administered by RWQCB, requires the project to reduce, to the maximum extent practicable, pollutant loadings from the roadway once construction is complete. The permit stipulates that permanent measures to control pollutant discharges must be considered and implemented for all new or reconstructed facilities.

WQ-2: During the PS&E phase, the PDT will consider biofiltration swales/strips, detention devices, and gross solid removal devices to promote infiltration and dispersion of runoff.

WQ-3: During the PS&E phase, design drainage that includes the use of culvert end devices such as flared end sections, tees, and rock slope protection to dissipate and disperse the energy of runoff as it flows out of the culverts onto open land, existing ditches, or treatment BMPs.

WQ-4: During the PS&E phase, design hydromodification management measures that are sized per the Alameda Countywide Clean Water Program's C.3 Technical Guidance (2016).

2.2.3 Paleontology

2.2.3.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved 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 USC 1.9(a) requires that the use of Federal-aid funds must be in conformity with all federal and state laws.
- 23 USC 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by CEQA.

2.2.3.2 Affected Environment

This section summarizes the *Paleontological Evaluation Report/Paleontological Mitigation Plan* prepared for the proposed project, which was completed in February 2019 (AECOM 2019b).

The project area passes through the San Ramon Valley, Livermore-Amador Valley, Arroyo de la Laguna, and Sunol Valley, which are flanked by elevated terraces, low-lying hills, and northwest-trending ridges. These valley areas are filled with Quaternary sediments derived from erosion of the surrounding hills that are composed of Tertiary sedimentary and Cretaceous age rocks. The geological units present in the project area are shown on Figure 2.2.3-1.

Historic sediments in the area including artificial fill (af) and artificial stream channel (Qhsc) are man-made deposits of various materials and ages that were placed or modified in the last several hundred years. These deposits are considered too young to contain fossils.

Holocene deposits are sediments that were deposited in the last 11,000 years before present (bp) and include Stream Channel deposits (Qhsc), Floodplain deposits (Qhfp), Basin deposits (Qhb), and Alluvial Fan deposits (Qhaf). These deposits also are considered too young to contain fossils.

Pleistocene deposits are sediments that were deposited during the Ice Age that occurred between 11,000 years before present (bp) to 2.6 million years bp. The Pleistocene deposits in the area include Alluvial Fan deposits. Pleistocene deposits in the area have produced vertebrate and invertebrate fossils. Vertebrate fossils include small and large mammals, reptiles, and fish (Savage 1951; Stirton 1951; Jefferson 1991a, 1991b). Two vertebrate fossil localities reported by Hall (1958) in “terrace deposits” in the eastern part of the San Ramon Valley were noted to contain bison, horse, sloth, and mammoth fossils, but Savage (1951) noted that they may have been from the Livermore Gravels. Invertebrate fossils include freshwater clams, mussels, and snails (Hertlein 1951; Hall 1958). During Caltrans construction work in October 2018 along I-680 approximately 5 miles south of the project area, mammoth fossils including a tooth, a partial limb, a scapula, a partial rib, and a skull were discovered in the presumed Pleistocene

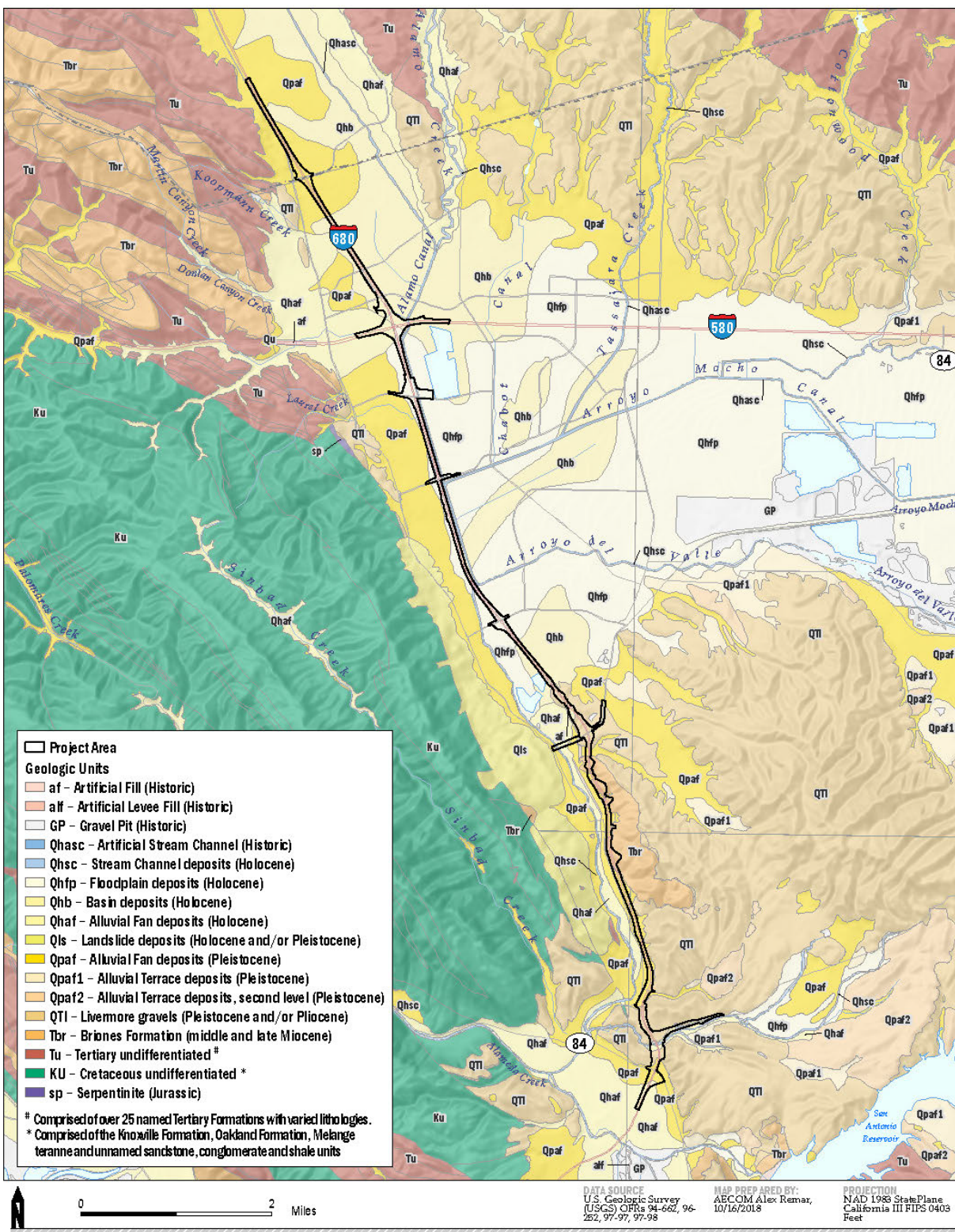


Figure 2.2.3-1: Project Area Geology Map

Alluvial Fan deposits. Alluvial Fan deposits outcrop in numerous places along the project alignment.

Pliocene/Pleistocene deposits in the area include the Livermore Gravels. The Livermore Gravels primarily occur in the hills flanking the San Ramon, Livermore-Amador, and Sunol Valleys. In the vicinity of the Livermore-Amador Valley, the Livermore Gravels contain a maximum thickness of 4,000 feet (Hall, 1958). The Livermore Gravels contain well-documented fossil vertebrate, invertebrate, plant, and microfossil finds (Savage 1951; Stirton 1951; Jefferson 1991a, 1991b). Hall (1958) noted that horse fossils were collected from the Livermore Gravels but indicated they may have come from older formations. Savage (1951) listed the occurrences of two vertebrate fossil localities in the area to contain bison, horse, sloth, and mammoth. The University of California Museum of Paleontology online collection contained four recorded fossil locations within the Livermore Gravels. All four locations are within Alameda County and all contained vertebrate fossils. Vertebrate fossils found at these locations included horse and other mammal teeth fragments, a mammoth tusk, a water bird wing fossil, turtle shell, and squirrel fossil fragments. QTI outcrops mainly in the southern portion of the project study area along Arroyo de la Laguna.

Miocene deposits in the area include the Briones Formation (Tbr). In the vicinity of the Livermore-Amador Valley, the Briones Formation can range from 2,000 to 5,000 feet in thickness (Trask 1922; Hays 1958). Certain horizons of the Briones Formation are very fossiliferous and contain well document finds of vertebrate, invertebrate, plant, and microfossils (Trask 1922; Hall 1958; Graymer et al. 1996; Jefferson 1991a, 1991b). Of special paleontological significance, the Briones Formation contains fossils of the *Desmostylus californicus* (Hay 1923; Fossilworks 2018), a large, hippopotamus-like herbivore that is commonly up to 6 feet long and weighed about 440 pounds. The University of California Museum of Paleontology online collection contained 260 recorded fossil localities within the Briones Formation, of which 26 contained vertebrate fossils. Of these 26 recorded vertebrate locations, three were in Alameda County and 19 were in Contra Costa County. Vertebrate fossils recovered from the Briones Formation include several localities with teeth, mandible, and pelvis fragments from *Desmostylus californicus*. Other University of California Museum of Paleontology recorded fossils within the Briones Formation include a seal tooth, shark and bony fish teeth, and a ray's spine. Tbr outcrops along numerous places along the project area route.

Determining Paleontological Sensitivity

Caltrans uses a three-part scale to characterize paleontological sensitivity, consisting of no potential, low potential, and high potential (Caltrans 2012). The scale generally correlates with the likelihood for a geologic unit to contain significant vertebrate, invertebrate, or plant fossils. A paleontological resource is significant if one or more of the following criteria apply:

- The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
- The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;

- The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
- The fossils demonstrate unusual or spectacular circumstances in the history of life;
- The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

Significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important.

The Pleistocene Alluvial Fan deposits (Qpaf), Pliocene/Pleistocene Livermore Gravels (QTI) and Miocene Briones Formation (Tbr) are all considered to have a high potential to contain significant paleontological resources. Historic sediments and Holocene deposits are considered too young to be paleontologically significant and have no paleontological resource sensitivity rating.

The entire project area is located within or underlain by geologic units that could contain significant, nonrenewable paleontological resources.

2.2.3.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not include any ground-disturbing activities and would therefore not affect paleontological resources.

Build Alternative

Proposed project activities would encounter geologic units that are known to contain paleontological resources. Locations where ground-disturbing activities are proposed in paleontologically sensitive geologic units are summarized below. The specific depths and locations of all excavations are preliminary and will be reevaluated as the project design progresses.

- Bridge widening along the outside lanes of northbound I-680 at the Pleasanton Sunol Road undercrossing with ground disturbance to depths of 30 feet bgs.
- Bridge widening along the outside lanes of northbound I-680 at the Dublin Boulevard undercrossing with ground disturbance to depths of 55 feet bgs.
- Bridge widening along the outside lanes of northbound I-680 at Amador Valley Boulevard undercrossing with ground disturbance to depths of 55 feet bgs.

- Excavation for the CHP enforcement protected observation area tentatively proposed between Bernal Avenue and Las Positas Boulevard, with ground disturbance to 3 feet bgs.
- Auger drilling of boreholes for the cast-in-drilled-hole (CIDH) piles for the installation of toll gantries to maximum depths of 14 feet bgs.
- Auger drilling of boreholes for CIDH piles for the installation of VTMSs and static/non-electrical signs to depths ranging from 25 to 40 feet bgs.
- Lane widening and reconstruction activities with ground disturbance to depths of 4 feet bgs.
- Construction of new retaining walls with ground disturbance to 5 to 7 feet bgs.
- Excavation and/or grading for the maintenance vehicle access areas along the outside northbound and southbound lanes with ground disturbance to depths of 4 feet bgs.
- Trenching for the installation of electrical conduit and steel casing piping with ground disturbance to 3 to 6 feet bgs.
- Auger drilling of boreholes for the CIDH piles for safety lighting foundations to depths of 9 feet bgs.
- Excavation and/or grading for the installation of biofiltration swales (bioswales) with ground disturbance to 4 feet bgs and detention basins with ground disturbance to 6 feet bgs.

Caltrans Standard Specification 14-7.03 will be implemented to provide for stopping work, securing the area, and performing further investigation if paleontological resources are encountered during project construction. In addition, the implementation of Measure PAL-1 described in Section 2.2.3.4 will be required for the ground-disturbance phases of the activities listed above to minimize potential effects on paleontological resources, if present. Measure PAL-1 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.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

PAL-1. Implementation of the following measures will avoid potential impacts to sensitive paleontological resources, if present.

- Update and finalize the Paleontological Mitigation Plan once project design is nearly complete. The final plan will be implemented during construction.
- Include a specification in the construction contract stating that paleontological monitoring will occur in accordance with the Paleontological Mitigation Plan.

2.2.4 Hazardous Waste/Materials

2.2.4.1 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, and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 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 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
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the acts listed above, 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.

2.2.4.2 Affected Environment

The analysis summarized in this section is based on the *Initial Site Assessment* (ISA) prepared for the project (Baseline Environmental Consulting [Baseline] 2018), completed in September 2018.

The purpose of the ISA is to identify and evaluate the level of risk associated with hazardous materials, hazardous waste, and/or contamination within the project area that could potentially be disturbed during the proposed construction activities. Preparation of the ISA included review and evaluation of the physical setting, historical land uses, regulatory agency environmental records, previous environmental investigations in the project vicinity, and a site reconnaissance.

Hazardous Materials Sites

The review of environmental records identified 83 existing hazardous materials release sites within 1 mile of the project site. Thirteen active release sites were identified within, adjacent to, or hydraulically upgradient of the project area. These sites are discussed further below and shown on Figures 2.2.4-1 (northern project area) and 2.2.4-2 (southern project area).

Shell #13-5244: In 2004, a release of petroleum from leaking underground storage tanks (USTs) was reported at the Shell #13-5244 site (Site 01 in Figure 2.2.4-1). Based on recent groundwater monitoring activities, the edge of the petroleum hydrocarbon plume is located about 120 feet west of the project area. Therefore, groundwater contamination from the release site is not expected to be encountered during project construction.

Shamrock Ford: In 2000, petroleum hydrocarbon contamination was reported in soil and groundwater samples collected at the Shamrock Ford site (Site 02 in Figure 2.2.4-1). The samples were collected in a former hazardous materials storage area associated with automotive repair activities, as well areas downgradient of former gasoline and waste oil USTs. The extent of groundwater contamination has not been defined; however, petroleum hydrocarbon contamination was reported in a groundwater sample collected immediately adjacent to the project area. Therefore, groundwater contamination from the release site could potentially be encountered during project construction.

Crown Chevrolet North Parcel: In 2009, petroleum hydrocarbon contamination was reported in soil and groundwater samples collected at the Crown Chevrolet North Parcel site (Site 03 in Figure 2.2.4-1). In 2011, chlorinated solvents were also reported in groundwater samples collected on the northern portion of the release site. The chlorinated solvent plume is reportedly from an offsite source. Based on recent groundwater monitoring activities, the edges of the petroleum hydrocarbon and chlorinated solvent plumes are located more than 400 feet west of the project area. Therefore, groundwater contamination from the release site is not expected to be encountered during project construction.

Chevron #9-2582: In 1989, a release of petroleum from leaking USTs was reported at the Chevron #9-2582 site (Site 04 in Figure 2.2.4-1). Based on recent groundwater monitoring activities, the edge of the petroleum hydrocarbon plume is located about 100 feet east of the project area. Therefore, groundwater contamination from the release site is not expected to be encountered during project construction.

Dublin Crossroads Center & Park Ave Cleaners: In 2012, a release of chlorinated solvents from former dry-cleaning machines was reported at the Dublin Crossroads Center & Park Ave Cleaners site (Site 05 in Figure 2.2.4-1). Based on a 2013 subsurface investigation, the edge of the chlorinated solvent plume is about 450 feet east of the project area. Therefore, groundwater contamination from the release site is not expected to be encountered during project construction.

Former Chevron Records Facility: In 2007, a release of chlorinated solvents from an aboveground storage tank was reported at the Former Chevron Records Facility site (Site 06 in Figure 2.2.4-1). Based on recent groundwater monitoring activities, the edge of the chlorinated solvent plume is located about 1,400 feet northeast of the project area. Therefore, groundwater contamination from the release site is not expected to be encountered during project construction.

Dublin Toyota Pontiac: In 1998, a release of petroleum from leaking USTs was reported at the Dublin Toyota Pontiac site (Site 07 in Figure 2.2.4-1). Methyl-tert butyl ether is the primary contaminant of concern. Based on recent groundwater monitoring activities, the methyl-tert butyl ether plume appears to extend south from the release site beneath the I-580 corridor immediately adjacent to the project area. Therefore, groundwater contamination from the release site could potentially be encountered during project construction.

Clorox Technical Center Pleasanton - Former Clorox Campus - Building 9: The site (Site 08 in Figure 2.2.4-1) is part of the former Clorox Campus Site. In 2013, a release of chlorinated solvents and Freon 113 was reported at the site. Based on recent groundwater monitoring activities, the edges of the chlorinated solvent and Freon 113 plumes are located about 700 feet and 850 feet northeast of the project area, respectively. Therefore, groundwater contamination from the release site is not expected to be encountered during project construction.

Clorox Technical Center Pleasanton - Former Clorox Campus - Building 7: The site (Site 09 in Figure 2.2.4-1) is part of the former Clorox Campus Site. In 2013, a release of chlorinated solvents was reported at the site. Based on recent groundwater monitoring activities, the edge of the chlorinated solvent plume is located about 280 feet northeast of the project area. Therefore, groundwater contamination from the release site is not expected to be encountered during project construction.

DSRSD Pleasanton - Biosolids Ponds: Each year, stabilized sludge is removed from the DSRSD's Facultative Sludge Lagoons and injected beneath the surface of the soil at the Dedicated Land Disposal (DLD) facility (Site 10 in Figure 2.2.4-1). The surface of the DLD facility is tilled every spring for biosolids harvesting, and again every fall for planting a cover crop. The DLD facility is underlain by an aquiclude composed of silts and clays to a depth of approximately 42 feet. In accordance with WDR Order No. R2-2007-0053, groundwater monitoring is performed around the lagoons and DLD facility. Groundwater samples have been analyzed for dissolved metals, polychlorinated biphenyls (PCBs), pesticides, and chlorophenoxy herbicides. Based on recent groundwater monitoring activities, there is no indication that DSRSD activities have adversely affected groundwater quality. Therefore, project construction is not expected to encounter groundwater contamination from the disposal site.

Ponderosa Homes: In 2007, a subsurface investigation was performed at the Ponderosa Homes site (Site 11 in Figure 2.2.4-1), which has historically been occupied by an orchard and is located immediately west of the project area. The primary purpose of the investigation was to evaluate the potential presence of residual pesticides in shallow soils. The investigation identified

concentrations of metals below background levels and relatively low concentrations of organochlorine pesticides (OCPs) that do not pose a risk to human health. Therefore, residual pesticide contamination in the project area (if any) from the orchard site would not be expected to affect project construction.

Laguna Oaks Site: In 1990, a release of PCBs was reported at the Laguna Oaks Site (Site 12 in Figure 2.2.4-1). The site is located about 1,600 feet west of the project area. Therefore, contamination from the release site is not expected to be encountered during project construction.

Walgreens Sunol: In 2014, a Walgreens semi-truck and trailer crashed during a rain event on the east side of I-680 about 400 feet south of the Koopman Road undercrossing (Site 13 in Figure 2.2.4-2). The crash reportedly released about 150 gallons of diesel fuel. Cleanup occurred soon after the spill and contaminated soil was excavated and disposed of off-site. The diesel entered a ditch that drains north toward Koopman Road where it then entered a concrete drainage culvert that passes under the I-680 highway and Pleasanton Sunol Road to the west and ultimately discharges to Arroyo de la Laguna. An emergency response cleanup team reportedly removed vegetation debris and soil that appeared to be impacted from the downgradient ditch and culvert drain. A groundwater sample collected in July 2018 from near the culvert beneath I-680 had a reported total petroleum hydrocarbon as diesel concentration that exceeds the effluent limitation for discharging to a storm drain or surface water during construction dewatering (per the San Francisco Bay Regional Water Quality Control Board Volatile Organic Compounds and Fuel General Permit, R2-2012-0012) (Baseline 2018). Therefore, groundwater contamination from the release site could potentially affect project construction.

Based on the review of environmental records, 15 other release sites identified adjacent to the project area have been closed because investigation and remedial actions have been completed. The primary constituents of concern at the closed release sites include petroleum hydrocarbons, chlorinated solvents, and metals. Residual groundwater contamination from the adjacent release sites could potentially be encountered during project construction.

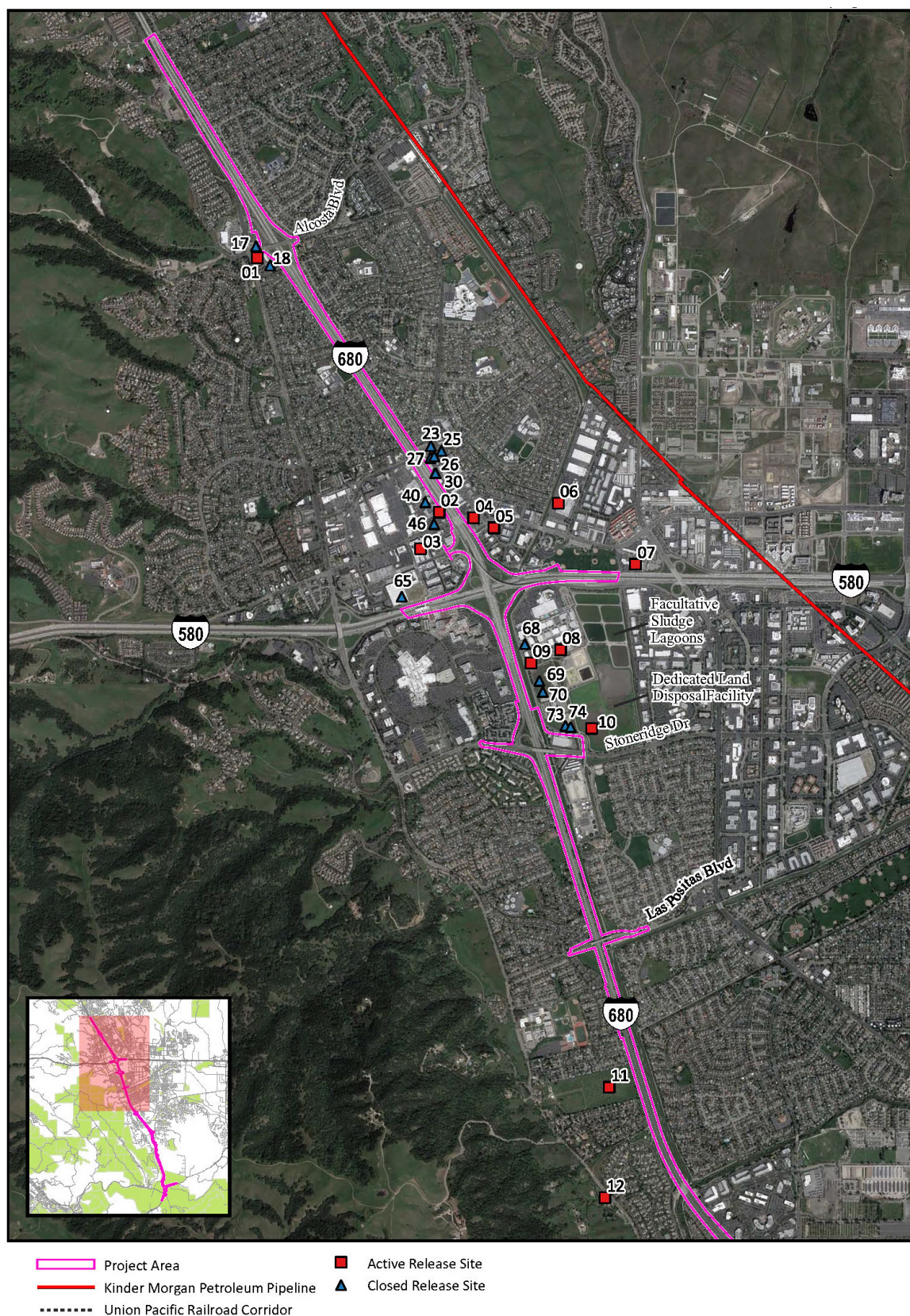


Figure 2.2.4-1: Hazardous Materials Release Sites, Northern Project Area Aerial View

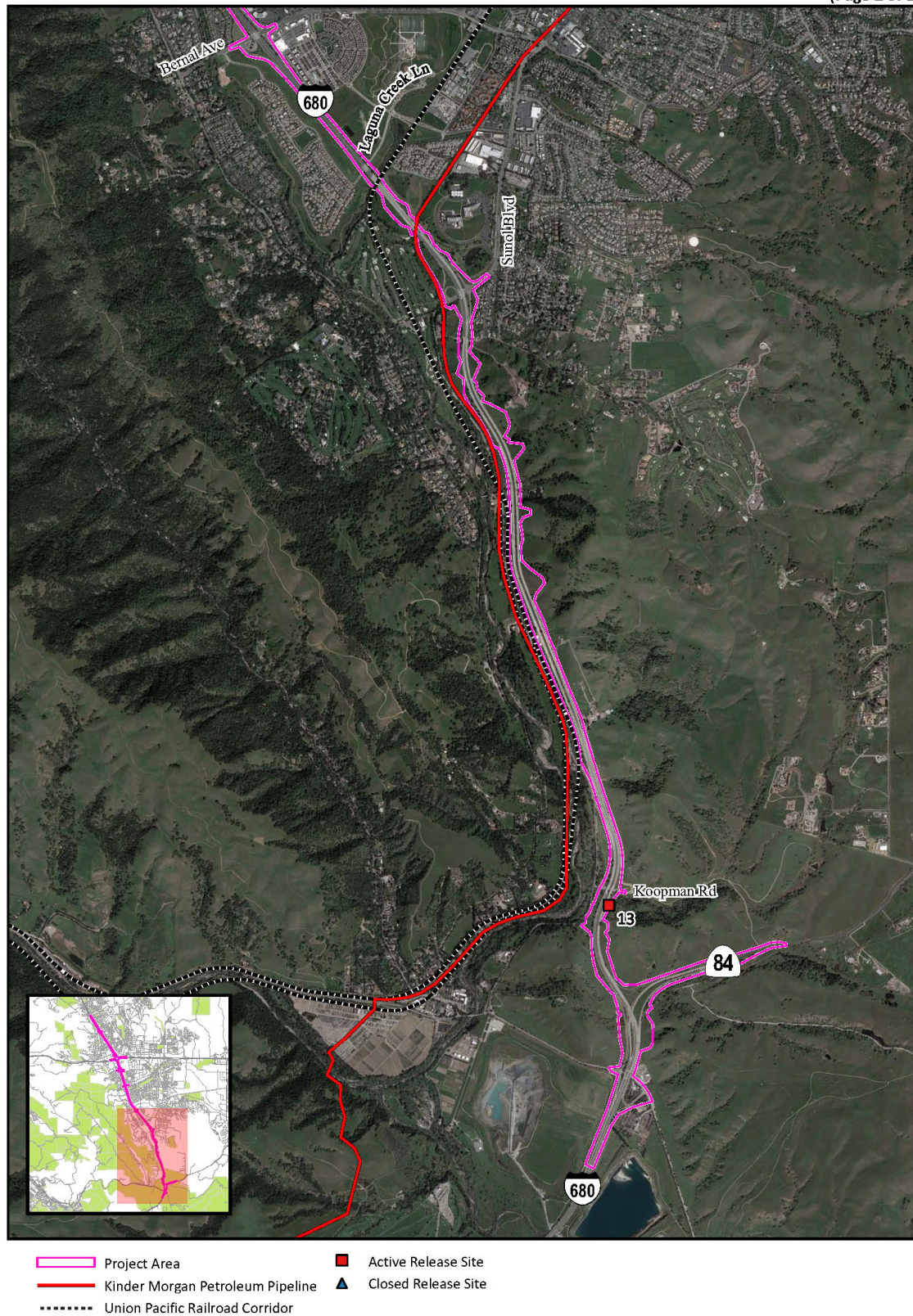


Figure 2.2.4-2: Hazardous Materials Release Sites, Southern Project Area Aerial View

The other 55 release sites are not expected to pose a threat of affecting environmental conditions within the project area because a pathway for contaminant migration does not exist (e.g., the release site is downgradient).

Aerially-Deposited Lead (ADL)

Lead alkyl compounds were added to gasoline from 1920 to the mid-1980s. As a result, shallow soils within approximately 30 feet of the edge of pavement in highway corridors have the potential to be contaminated with ADL from historical vehicle emissions before the elimination of lead in gasoline.

Within the project area, I-680 and SR 84 were constructed in the late 1960s, which was before the phase-out of lead in gasoline. Therefore, the project area has the potential to include shallow soils with ADL contamination.

Pesticide Residues from Agriculture

Inorganic pesticides containing elevated concentrations of metals were commonly used in California before 1950. From 1950 to the mid-1970s, OCPs were commonly used. Arsenic from inorganic pesticides and residues from OCPs used in the past have the potential to persist for many decades in shallow soils.

The project area and surrounding areas were predominantly used for agriculture as early as 1939. As a result, shallow soils within the project area may be contaminated with arsenic or OCPs.

Soil Contamination from Railroad Corridors

The most commonly reported soil contaminants along railroad corridors are metals and petroleum products from railroad operations. Elevated concentrations of arsenic are common in shallow soils from historical applications of inorganic herbicides and leaching from chemically-preserved railroad ties and arsenic-laced slag used as ballast material. Other sources of contaminants associated with historical railroad operations may include coal ash from engines and polynuclear aromatic hydrocarbons from diesel exhaust. The risk of soil contamination is generally greater at railyards and along railroad corridors that are adjacent to industrial areas, where historical loading practices, leaks during material transfers or storage, and repair activities may have contaminated the soil.

The Union Pacific Railroad corridor crosses beneath I-680 about 400 feet south of Laguna Creek Lane and then travels south parallel to the west side of the project area (Figure 2.2.4-2). The project area has the potential to include soils contaminated by historical railroad operations.

Petroleum from Utility Pipelines

Existing pipeline safety regulations minimize the potential impacts associated with future releases of petroleum; however, they do not remove the risk of undocumented petroleum releases that may have occurred in the past. Contaminants of concern from petroleum pipelines include gasoline, diesel, jet fuel, and polynuclear aromatic hydrocarbons.

An underground petroleum pipeline owned and operated by Kinder Morgan crosses beneath I-680 between Laguna Creek Lane and Sunol Boulevard, and then travels south parallel to the

west side of the project area (Figures 2.2.4-1 and 2.2.4-2). Soils and groundwater near the pipeline have the potential to be contaminated by undocumented releases of petroleum.

Hazardous Building Materials

Existing building, bridge, wall, and roadway structures within the project area have the potential to contain hazardous building materials.

Lead-based Paint and Asbestos-Containing Materials

Any bridge, wall, commercial building, or industrial building structure, regardless of construction date, could have surfaces that have been coated with lead-based paint. Asbestos-containing materials may be present in buildings, bridges, and walls constructed before 1981. Lead and asbestos are state-recognized carcinogens, and lead is a reproductive toxicant.

Yellow Traffic Striping and Pavement Markers

Before 1997, Caltrans used lead-based paint for yellow traffic stripe and pavement markings along roadways. Therefore, the existing yellow thermoplastic and yellow paint on the roadway may contain lead.

Asphalt and Portland-Cement Concrete

Asphalt concrete and Portland-cement concrete have a relatively high pH and may contain metals and petroleum hydrocarbons.

Naturally-Occurring Asbestos in Bedrock

Geologic mapping from the U.S. Geological Survey does not show any areas of rock likely to contain naturally-occurring asbestos within the project area. However, undocumented fill material in the project corridor could potentially contain naturally occurring asbestos imported from other areas.

Contaminated Soil from Fill Materials

Fill materials used for embankments within the project area could have come from a variety of sources, and some sources could have been contaminated with naturally-occurring asbestos or industrial wastes. Industrial wastes, such as slag, typically contain elevated levels of metals. Therefore, project construction could potentially encounter soils contaminated with asbestos and/or metals in fill embankments.

2.2.4.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect potential hazardous material sites in the project area.

Build Alternative

Handling and Storage of Hazardous Materials

Project construction and maintenance activities are expected to involve the routine transport, use, and disposal of hazardous materials (e.g., fuels, paints, and lubricants) that could pose a threat to human health or the environment if not properly managed. The transport, use, and disposal of hazardous materials during construction is regulated and enforced by federal and state agencies.

Workers who handle hazardous materials are required to adhere to OSHA and California Division of Occupational Safety and Health (Cal/OSHA) health and safety requirements. Hazardous materials must be transported in accordance with RCRA and USDOT regulations and disposed of in accordance with RCRA and the California Code of Regulations at a facility that is permitted to accept the waste.

In accordance with the SWRCB, a SWPPP must be prepared and implemented during construction for coverage under the Construction General Permit. The SWPPP requires implementation of BMPs for hazardous materials storage and soil stockpiles, inspections, maintenance, training of employees, and containment of releases to prevent runoff into existing storm water collection systems or waterways.

Adherence to federal and state regulations during project construction and maintenance reduces the risk of exposure to hazardous materials and accidental hazardous materials releases. Compliance with existing regulations is mandatory; therefore, construction of the Build Alternative is not expected to create a hazard to construction workers, the public, or the environment through the routine transport, use, disposal, or accidental release of hazardous materials. As a result, the project would have no adverse effects related to the routine transport, use, disposal, or accidental release of hazardous materials during construction and maintenance activities and no mitigation is required.

Disturbance of Hazardous Materials

As noted in the findings of the ISA, construction and maintenance of the Build Alternative could result in the potential disturbance of hazardous materials in soil, groundwater, and building materials in the project corridor.

The following hazardous material conditions could affect the Build Alternative:

- Lead contamination in shallow soils along the I-680 and SR 84 highway corridors associated with ADL from historical vehicle emissions;
- Dispersed pesticide contamination (arsenic and OCPs) in shallow soils associated with historical agricultural practices;
- Undocumented soil contamination (metals and petroleum hydrocarbons) associated with historical operation of the Union Pacific Railroad corridor that crosses the project area;
- Undocumented soil and/or groundwater contamination (petroleum hydrocarbons) associated with historical operation of the Kinder Morgan petroleum pipeline that crosses and travels parallel to the west of the project area;
- Hazardous building materials:
 - Lead-based paint and asbestos-containing materials in existing building, bridge, and wall structures;
 - Lead-based paint on roadways (yellow traffic stripe and pavement markings); and
 - Petroleum hydrocarbons, metals, and high pH in asphalt concrete and Portland-cement concrete grindings.

- Undocumented soil contamination (metals and asbestos) in fill materials used for soil embankments; and
- Residual groundwater contamination (petroleum hydrocarbons, chlorinated solvents, and metals) from documented hazardous materials release sites.

The sources of potential residual contamination from documented releases that could affect soil and/or groundwater within the project area include 15 closed release sites adjacent to the project and the following three active release sites: Shamrock Ford (Site 02 in Figure 2.2.4-1), Dublin Toyota Pontiac (Site 07 in Figure 2.2.4-1), and Walgreens Sunol (Site 13 in Figure 2.2.4-2).

Soil determined to contain ADL contamination exceeding California hazardous waste thresholds may be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control (DTSC). This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met.

The disturbance of hazardous materials during project construction and maintenance activities, such as excavation and dewatering, could pose an adverse effect to human health and the environment. Implementation of Measure HAZ-1 (described in Section 2.2.4.4, below) would ensure that potential hazardous materials in soil, groundwater, and building materials are investigated before construction and site-specific control measures are incorporated into the final project design to address the potential adverse effects to human health and the environment that could result from the disturbance of hazardous materials.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.2.4.4 Avoidance, Minimization, and/or Mitigation Measures

HAZ-1: During the final project design phase, a Preliminary Site Investigation will be performed in accordance with current Caltrans guidance to investigate hazardous materials concerns related to soil, groundwater, and building materials within the project limits and will include required measures for managing hazardous materials encountered during project construction to protect human health and the environment. These measures shall be incorporated in the final project design.

Anticipated measures include the following:

- ADL-contaminated soils exceeding California hazardous waste thresholds shall be reused in accordance with the DTSC's 2016 *Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils*.
- Lead compliance plans for ADL-contaminated soils and pavement markings containing lead shall be prepared in accordance with the Caltrans Standard Special Provisions and implemented by the project construction contractor(s) to ensure compliance with OSHA and Cal/OSHA worker safety regulations.
- Groundwater from dewatering of excavations shall be stored in Baker tanks during construction activities and characterized to determine the appropriate treatment

requirements for discharge and disposal. The extracted groundwater shall be collected and managed for disposal/treatment in compliance with local and state regulations.

- All loose and peeling lead-based paint and asbestos-containing material shall be removed by a certified contractor(s) in accordance with local, state, and federal requirements. All other hazardous materials will be removed from structures in accordance with Cal/OSHA regulations.
- Asphalt concrete and Portland cement concrete grindings shall be reused in accordance with the San Francisco Bay RWQCB's (2007) guidance to protect water quality or transported off-site for recycling or disposal.

2.2.5 Air Quality

2.2.5.1 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 USEPA and CARB, 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 criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM)—which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM₁₀) and particles of 2.5 micrometers and smaller (PM_{2.5}), lead (Pb), and sulfur dioxide (SO₂). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide, 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 NEPA. In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the 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 CO, NO₂, O₃, particulate matter (PM₁₀ and PM_{2.5}), and in some areas (although not in California), SO₂. California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO₂, and also has a nonattainment area for lead; however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of 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 FTIP). 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 FCAA and the SIP are met. If the

conformity analysis is successful, the Metropolitan Planning Organization, FHWA, and FTA make the 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 and scope and the “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.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

2.2.5.2 Affected Environment

This section summarizes the *Air Quality Report* (Baseline 2019) that was completed for the proposed project in September 2019 and the *Air Quality Report Addendum* (Baseline 2020) that was completed for the project in May 2020.

Climate, Meteorology, and Topography

The project is within the Livermore Valley climatological subregion of the San Francisco Bay Area Air Basin (SFBAAB), as defined by the Bay Area Air Quality Management District (BAAQMD). Air basins have natural characteristics that limit the ability of natural processes to either dilute or transport air pollutants. The major determinants of air pollution transport and dilution are climatic and topographic factors such as wind, atmospheric stability, terrain that influences air movement, and sunshine. Wind and terrain can combine to transport pollutants away from upwind areas, while solar energy can chemically transform pollutants in the air to create secondary photochemical pollutants such as O₃.

The Bay Area has a Mediterranean climate characterized by wet winters and dry summers. During the summer, a high-pressure cell centered over the northeastern Pacific Ocean results in stable meteorological conditions and a steady northwesterly wind flow that keep storms from affecting the California coast. During the winter, the Pacific high-pressure cell weakens, resulting in increased precipitation and the occurrence of storms. The highest air pollutant concentrations in the Bay Area generally occur during inversions, when a surface layer of cooler air becomes trapped beneath a layer of warmer air. An inversion reduces the amount of vertical mixing and dilution of air pollutants in the cooler air near the surface.

The Livermore Valley is a sheltered inland valley within the Diablo Range near the eastern border of the SFBAAB. In the summer, the Livermore Valley is characterized by clear skies and relatively warm weather with maximum temperatures ranging from the high 80s to low 90s (degrees Fahrenheit). Cold water upwelling along the coast and hot inland temperatures during the summer can cause a strong onshore pressure gradient, which translates into a strong afternoon wind. In the winter, the air flow in the Livermore Valley is often affected by local conditions. Winter temperatures are mild and usually range from the high 30s to low 60s (degrees Fahrenheit). The mean precipitation in the winter is about 14 inches.

For the Livermore Valley, the air pollution potential is high especially for photochemical pollutants. The Livermore Valley not only traps locally generated pollutants but can be the receptor of O₃ and O₃ precursors from San Francisco, Contra Costa, and Santa Clara counties, as well as other parts of Alameda County.

Regional Air Quality Conformity

The BAAQMD monitors pollutants of concern and air quality conditions throughout the SFBAAB. Table 2.2.5-1 provides a summary of the applicable air quality standards and the SFBAAB's attainment status with respect to the air quality standards. For the NAAQS, the SFBAAB is currently designated as a maintenance area⁷ for the 8-hour CO standard and a nonattainment area for the 8-hour O₃ standard and 24-hour PM_{2.5} standard. The SFBAAB is designated as attainment/unclassifiable for the remaining NAAQS. For the California Ambient Air Quality Standards (CAAQS), the SFBAAB is designated as a nonattainment area for the 1-hour and 8-hour O₃ standards, the annual average and 24-hour PM₁₀ standards, and the annual average PM_{2.5} standard. The SFBAAB is designated as attainment/unclassified for the remaining CAAQS.

As of June 1, 2018, transportation conformity requirements for the CO NAAQS ended. The terms of the CO maintenance plan remain in effect and all measures and requirements contained in the plan apply until the state submits, and the USEPA approves, a revision to the SIP (USEPA 2018b).

Local Ambient Air Quality

The BAAQMD operates a network of air monitoring stations throughout the SFBAAB to monitor air pollutants such as O₃, PM₁₀, and PM_{2.5}. The nearest air monitoring station in the Livermore Valley climatological subregion of the SFBAAB where O₃ levels and PM_{2.5} levels are measured is the Livermore station at 793 Rincon Avenue in Livermore, approximately 6.9 miles east of the project. The nearest station where CO and PM₁₀ levels are measured is the Concord station at 2975 Treat Boulevard in Concord, approximately 17 miles northwest of the project. These stations are considered representative of the project area as they are closest to the project area and experience similar meteorological conditions.

⁷ On March 31, 1998, the USEPA approved California's SIP revision and the redesignation became effective on June 1, 1998. CARB submitted a revised CO plan to the USEPA on November 8, 2004, with an update to the CO maintenance plan that showed how the 10 urban areas will continue to maintain the CO standard through 2018.

Table 2.2.5-1: State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State ¹ Standard	Federal ² Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
O ₃	1 hour	0.09 ppm	-- ³	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic volatile organic compounds may also contribute.	Low-altitude O ₃ is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NO _x) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.	Nonattainment	Nonattainment
O ₃	8 hours	0.070 ppm	0.070 ppm (4 th highest in 3 years)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic volatile organic compounds may also contribute.	Low-altitude O ₃ is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NO _x) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.	Nonattainment	Nonattainment/Marginal
CO	1 hour	20 ppm	35 ppm	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical O ₃ . Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Attainment	Attainment-Maintenance (Moderate)
CO	8 hours	9.0 ppm ¹	9 ppm	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical O ₃ . Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Attainment	Attainment-Maintenance (Moderate)

Pollutant	Averaging Time	State ¹ Standard	Federal ² Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Respirable Particulate Matter (PM ₁₀) ⁴	24 hours	50 µg/m ³ ⁶	150 µg/m ³ (expected number of days above standard < or equal to 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic & other aerosol and solid compounds are part of PM ₁₀ .	Dust- and fume-producing industrial and agricultural operations; combustion smoke & vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	Nonattainment	Attainment/ Unclassifiable
Respirable Particulate Matter (PM ₁₀) ⁴	Annual	20 µg/m ³	-- ⁴	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic & other aerosol and solid compounds are part of PM ₁₀ .	Dust- and fume-producing industrial and agricultural operations; combustion smoke & vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	Nonattainment	Attainment/ Unclassifiable
Fine Particulate Matter (PM _{2.5}) ⁴	24 hours	---	35 µg/m ³	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the PM _{2.5} size range. Many toxic & other aerosol and solid compounds are part of PM _{2.5} .	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NO _x , sulfur oxides (SO _x), ammonia, and ROG.	Nonattainment	Nonattainment (Moderate)

Pollutant	Averaging Time	State ¹ Standard	Federal ² Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Fine Particulate Matter (PM _{2.5}) ⁴	Annual	12 µg/m ³	12.0 µg/m ³	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the PM _{2.5} size range. Many toxic & other aerosol and solid compounds are part of PM _{2.5} .	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	Nonattainment	Attainment-Unclassifiable)
Fine Particulate Matter (PM _{2.5}) ⁴	Secondary Standard (annual; also for conformity process ⁴)	---	15 µg/m ³ (98 th percentile over 3 years)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the PM _{2.5} size range. Many toxic & other aerosol and solid compounds are part of PM _{2.5} .	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	Nonattainment	Attainment-Unclassifiable
NO ₂	1 hour	0.18 ppm	0.100 ppm ⁵	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of storm water. Part of the “NOx” group of O ₃ precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.	Attainment	Attainment
NO ₂	Annual	0.030 ppm	0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of storm water. Part of the “NOx” group of O ₃ precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.	Attainment	Attainment

Pollutant	Averaging Time	State ¹ Standard	Federal ² Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
SO ₂	1 hour	0.25 ppm	0.075 ppm ⁶ (99 th percentile over 3 years)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Attainment	Attainment/ Unclassifiable
SO ₂	3 hours	---	0.5 ppm ⁷	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Attainment	Attainment/ Unclassifiable
SO ₂	24 hours	0.04 ppm	0.14 ppm (for certain areas)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Attainment	Attainment/ Unclassifiable
SO ₂	Annual	---	0.030 ppm (for certain areas)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Attainment	Attainment/ Unclassifiable

Pollutant	Averaging Time	State ¹ Standard	Federal ² Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Lead ⁹	Monthly	1.5 µg/m ³	---	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. ADL from older gasoline use may exist in soils along major roads.	N/A	Attainment
Lead ⁹	Calendar Quarter	---	1.5 µg/m ³ (for certain areas)	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. ADL from older gasoline use may exist in soils along major roads	N/A	Attainment
Lead ⁹	Rolling 3-month average	---	0.15 µg/m ³ . ⁹	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. ADL from older gasoline use may exist in soils along major roads	N/A	Attainment
Sulfate	24 hours	25 µg/m ³	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	Attainment	N/A
Hydrogen Sulfide	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	Unclassified	N/A

Pollutant	Averaging Time	State ¹ Standard	Federal ² Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	---	Reduces visibility. Produces haze. NOTE: not directly related to the Regional Haze program under the FCAA, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas. However, some issues and measurement methods are similar.	See particulate matter above. May be related more to aerosols than to solid particles.	Unclassified	N/A
Vinyl Chloride ⁸	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes.	No information available	N/A

Notes: ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

¹ State standards are "not to exceed" or "not to be equaled or exceeded" unless stated otherwise.

² Federal standards are "not to exceed more than once a year" or as described above.

³ Prior to June 2005, the 1-hour O₃ NAAQS was 0.12 ppm. Emission budgets for 1-hour O₃ are still in use in some areas where 8-hour O₃ emission budgets have not been developed, such as the S.F. Bay Area.

⁴ Annual PM₁₀ NAAQS revoked October 2006; was 50 $\mu\text{g}/\text{m}^3$. 24-hr. PM_{2.5} NAAQS tightened October 2006; was 65 $\mu\text{g}/\text{m}^3$. Annual PM_{2.5} NAAQS tightened from 15 $\mu\text{g}/\text{m}^3$ to 12 $\mu\text{g}/\text{m}^3$. December 2012 and secondary annual standard set at 15 $\mu\text{g}/\text{m}^3$.

⁵ Final 1-hour NO₂ NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause re-designation to nonattainment in some areas after 2016.

⁶ USEPA finalized a 1-hour SO₂ standard of 75 ppb (parts per billion [thousand million]) in June 2010. Nonattainment areas have not yet been designated as of 9/2012.

⁷ Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.

⁸ The CARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM₁₀ and, in larger proportion, PM_{2.5}. Both the CARB and USEPA have identified lead and various organic compounds that are precursors to O₃ and PM_{2.5} as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

⁹ Lead NAAQS are not considered in Transportation Conformity analysis.

The most recent ambient air quality data recorded at the two stations from 2013 through 2017 for the criteria air pollutants that are in nonattainment are shown in Table 2.2.5-2. Exceedances of California standards for 1-hour O₃ occurred in 2013, 2015, 2016, and 2017. The national and California standards for 8-hour O₃ were exceeded in all five years. There was insufficient data available to determine the exceedances of the California standard for 24-hour PM₁₀ in 2013 and 2017, but the standard was not exceeded in 2014, 2015, or 2016. There was insufficient data available to determine the exceedances of the national standard for 24-hour PM₁₀ in 2017, but the standard was not exceeded in 2013, 2014, 2015, or 2016. Exceedances of the national standard for 24-hour PM_{2.5} occurred in 2013, 2014, and 2017.

Table 2.2.5-2. Air Quality Concentrations for the Past 5 Years Measured at the Livermore and Concord Air Monitoring Stations

Pollutant	Standard	2013	2014	2015	2016	2017
O ₃	Max 1-hour Concentration (ppm)	0.096	0.093	0.105	0.102	0.109
O ₃	Days > CAAQS (0.09 ppm)	3	0	1	2	5
O ₃	Max 8-hour Concentration (ppm)	0.077	0.08	0.082	0.085	0.09
O ₃	Days > CAAQS (0.070 ppm)	2	7	7	6	6
O ₃	Days > NAAQS (0.070 ppm)	2	6	7	4	6
Carbon Monoxide (CO)	Max 1-hour Concentration (ppm)	1.2	1.4	1.4	1.2	1.7
Carbon Monoxide (CO)	Days > CAAQS (20 ppm)	0	0	0	0	0
Carbon Monoxide (CO)	Days > CAAQS (35 ppm)	0	0	0	0	0
Carbon Monoxide (CO)	Max 8-hour Concentration (ppm)	0.8	0.8	0.8	0.8	0.9
Carbon Monoxide (CO)	Days > NAAQS (9.0 ppm)	0	0	0	0	0
PM ₁₀	Max 24-hour Concentration (µg/m ³)	50.5	42.5	24	19	41.2
PM ₁₀	Days > CAAQS (50 µg/m ³)	NV	0	0	0	NV
PM ₁₀	Days > NAAQS (150 µg/m ³)	0	0	0	0	NV
PM ₁₀	Annual Arithmetic Mean (µg/m ³)	8.3	14.1	13.1	11.5	6.5
PM _{2.5}	Max 24-hour Concentration (µg/m ³)	40.1	42.9	31.1	22.3	41.5
PM _{2.5}	Days > NAAQS (35 µg/m ³)	4	2	0	0	2
PM _{2.5}	Annual Arithmetic Mean (µg/m ³)	8.4	7.6	8.8	7.5	8.5

Source: CARB 2019b and CARB 2019c

Notes: CAAQS = California ambient air quality standards; µg/m³ = micrograms per cubic meter; NAAQS = National ambient air quality standards; ppm = parts per million; NV = no value due to insufficient data.

State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. When the measured state and national concentrations varied due to different sample methods, the highest concentration was reported in the summary table.

2.2.5.3 Environmental Consequences

Air quality issues relate to a range of different pollutants. 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.

The **No Build Alternative** would make no physical or operational changes to the project area that would affect air quality. The following discussion applies to the **Build Alternative**.

Regional Air Quality Conformity

The proposed project is included in the regional air quality conformity analysis for the current RTP, *Plan Bay Area 2040* (MTC and ABAG 2017a, amended 2020, RTP ID 17-10-0065). MTC found that regionally significant projects in the San Francisco Bay Area will conform to the purpose of the SIP and not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS as provided in Section 176(c) of the FCAA. The project is also included in the MTC's financially constrained 2019 TIP (MTC 2018, TIP ID ALA170009). The TIP gives priority to eligible Transportation Control Measures identified in the SIP and provides sufficient funds to provide for their implementation. FHWA and FTA approved MTC's conformity determination for *Plan Bay Area 2040* and the 2019 TIP on December 17, 2018.

The project's design concept, scope, and open-to-traffic date assumptions are generally consistent with the regional emissions analysis performed for the current RTP and TIP. Therefore, the project will not interfere with the timely implementation of any Transportation Control Measures identified in the SIP.

Project-Level Conformity

Particulate Matter Hot-Spot Analysis

A quantitative particulate matter hot-spot analysis is required for transportation projects that are in federal nonattainment or maintenance areas for PM₁₀ or PM_{2.5} and are determined to be a Project of Air Quality Concern (POAQC) as defined in 40 CFR Part 93. The SFBAAB is currently designated as an unclassifiable/attainment area for the federal PM₁₀ standard; therefore, a detailed PM₁₀ hot-spot analysis is not required for a project-level conformity determination. The SFBAAB is currently designated as a federal nonattainment area for PM_{2.5}; therefore, a PM_{2.5} hot-spot analysis is required if the project is determined to be a POAQC.

Rather than using specific PM_{2.5} measurements, the PM_{2.5} hot-spot demonstration process begins with an evaluation of whether a project fits into one or more of the POAQC categories listed in 40 CFR 93.123(b)(i)–(v). In the Bay Area, the process has been established by the MTC and requires interagency consultation with the Bay Area Air Quality Conformity Task Force (Task Force). The Task Force includes representatives from federal (USEPA, FHWA, FTA), state (CARB, Caltrans), regional (MTC, BAAQMD, and ABAG), and subregional (Congestion Management Agencies, transit operators, local jurisdictions, etc.) agencies.

In February 2019, Alameda CTC, as the project sponsor, initiated consultation with the Task Force by submitting a Project Assessment Form for PM_{2.5} Interagency Consultation. The Task Force considered projected future traffic conditions, with and without the project, and whether the project meets the specific regulatory definition of a POAQC set forth in 40 CFR Part 93. On March 1, 2019, the Task Force determined that the project is not a POAQC.

A detailed PM_{2.5} hot-spot analysis is not required for this project. The project will conform to the SIP, including the localized impact analysis conducted with interagency consultation required by

40 CFR 93.116 and 93.123. The Project Assessment Summary and the Air Quality Conformity Task Force determination are included in Appendix C.

Public comment is requested regarding the Task Force determination (Appendix C). Following the close of the public review and comment period for this IS/EA, all comments received on the air quality conformity determination will be submitted to FHWA. The final determination on project-level conformity will be made by FHWA.

Ozone Impact Analysis

The SFBAAB is currently designated as a federal nonattainment area for O₃. Because O₃ impacts are regional in nature, projects that are included in an RTP and TIP have already undergone regional conformity analysis and do not require further analysis for a project-level conformity determination. This project is included in a conforming RTP and TIP, and therefore emissions of O₃ precursors from project-related traffic are not anticipated to cause, contribute to, or worsen any violations of the federal air quality standards for O₃.

In addition, the BAAQMD adopted the 2017 Bay Area Clean Air Plan to plan for and achieve compliance with the federal and state O₃ standards. This project will not interfere with the control measures described in the 2017 Bay Area Clean Air Plan. Furthermore, the project will provide transportation benefits that reduce pollutant emissions, including O₃ precursors, by improving traffic operations and efficiency.

Additional Environmental Analysis

Criteria Pollutants

Project operations would generate emissions of criteria air pollutants and precursors that could potentially affect regional air quality. Operational emissions consider long-term changes in emissions due to the project (excluding the construction phase). According to the BAAQMD, the primary criteria air pollutant emissions of concern during project operation would be O₃ precursors (ROG and NO_x), PM₁₀, and PM_{2.5} from the exhaust of on-road vehicles. Criteria air pollutant emissions from project operations were estimated for the existing conditions (2018) and the No Build and Build Alternatives during the opening year (2025), horizon year (2040), and design year (2045) to support NEPA and CEQA review of the project.

A quantitative analysis of daily emissions was performed for ROG, NO_x, and exhaust PM₁₀ and PM_{2.5} using the Caltrans CT-EMFAC2017 model⁸ to compare the potential effects of the project Build and No-Build Alternatives. Estimated emissions for existing (2018), opening year (2025), horizon year (2040), and design year (2045) conditions are summarized in Table 2.2.5-3.

⁸ This analysis accounts for the effects of the US National Highway Traffic Safety Administration and Environmental Protection Agency SAFE (Safer Affordable Fuel-Efficient) Vehicles Rule. Part One revoking California's authority to set its own greenhouse gas emissions standards was published on September 27, 2019 and effective November 26, 2019. The SAFE Vehicles Rule Part 2 would amend existing Corporate Average Fuel Economy (CAFE) and tailpipe carbon dioxide emissions standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026. The proposal would retain the model year 2020 standards for both programs through model year 2026. The assumptions under the SAFE Vehicles Rule also affect criteria pollutant emissions. CARB has provided adjustment factors to be utilized in light of the SAFE Rule, and EPA approved the adjustment factors on March 12, 2020. The CARB adjustment factors were used in this analysis..

Table 2.2.5-3: Operational Criteria Air Pollutant Emissions (Pounds per Day)

Pollutant	2018 Existing	2025 No Build	2025 Build	2040 No Build	2040 Build	2045 No Build	2045 Build
ROG	2,079	1,486	1,481	1,270	1,259	1,185	1,176
NO _x	5,662	2,617	2,617	2,521	2,515	2,502	2,496
PM ₁₀ Exhaust	95	44	44	31	31	29	29
PM _{2.5} Exhaust	90	41	41	29	29	27	27

Note: Traffic data for the design year (2045) were used to conservatively estimate emissions during the horizon year (2040).

As shown in Table 2.2.5-3, daily emissions of ROG, NO_x, and exhaust PM₁₀ and PM_{2.5} estimated for both the Build and No Build Alternatives would be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018), because federal and state vehicle emissions standards are expected to reduce pollutant emissions over time. The estimated daily ROG, NO_x, and exhaust PM₁₀ and PM_{2.5} emissions for the Build Alternative during the opening year, horizon year, and design year scenarios would be approximately equal to or lower than the emissions for the No Build Alternative, because the Build Alternative would improve local traffic flow. In conclusion, the modeling results show that the Build Alternative would not result in an increase in criteria air pollutant emissions compared to the existing year conditions or the future No Build Alternative. Therefore, emissions of criteria air pollutants from project-related traffic are not anticipated to cause, contribute to, or worsen any air quality violations.

Mobile Source Air Toxics

Incomplete or Unavailable Information

According to 40 CFR 150.22, when an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an environmental impact statement and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

- If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.
- If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the environmental impact statement:
 - A statement that such information is incomplete or unavailable;
 - A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
 - A summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and

- The agency’s evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, “reasonably foreseeable” includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.
- The amended regulation will be applicable to all environmental impact statements for which a Notice to Intent (40 CFR 1508.22) is published in the Federal Register on or after May 27, 1986. For environmental impact statements in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

Approach to Analysis

In FHWA’s view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in mobile source air toxic (MSAT) emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The USEPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the FCAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The USEPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain Integrated Risk Information System, which is a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects. Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute. Two Health Effects Institute studies are summarized in Appendix D of FHWA’s (2016) *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations or in the future as vehicle emissions substantially decrease.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by Health Effects Institute. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel particulate matter. The USEPA states that with respect to diesel engine exhaust, “[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies have prevented the estimation of inhalation carcinogenic risk.”

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the USEPA as provided by the FCAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires USEPA to determine an “acceptable” level of cancer risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld USEPA’s approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Project-Level MSAT Analysis

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent the meaningful or reliable estimates of MSAT emissions and effects for this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSAT at the project level, it is possible to assess the levels of future MSAT emissions by comparing the Build and No Build alternatives.

The project’s potential air quality impacts related to long-term operations emissions of MSAT were evaluated in accordance with the FHWA’s (2016) *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*. According to the FHWA guidance, this project

is classified as a category 3 project (Projects with Higher Potential MSAT Effects). Projects with high potential MSAT effects include those that:

- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year; and
- Are proposed to be located in proximity to populated areas or, in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

According to FHWA guidance, the project has a high potential for MSAT effects because existing (2018) traffic volumes on I-680 in the project area range from approximately 149,000 to 203,000 AADT, and the project is in a populated area.

A quantitative analysis of daily emissions was performed for the nine priority MSATs using the Caltrans CT-EMFAC2017 model⁹ and Caltrans Ethylbenzene Emissions Calculator to compare the potential effects of the project Build and No Build Alternatives. Estimated MSAT emissions for existing (2018), opening year (2025), horizon year (2040), and design year (2045) conditions in the project area are summarized in Table 2.2.5-4.

Table 2.2.5-4: Operational MSAT Emissions (grams per day)

Pollutant	2018 Existing	2025 No Build	2025 Build	2040 No Build	2040 Build	2045 No Build	2045 Build
Benzene	18,675	12,023	11,999	10,997	10,943	10,542	10,492
Acrolein	635	389	389	374	374	367	367
Acetaldehyde	6,887	2,381	2,380	2,686	2,681	2,665	2,660
Formaldehyde	18,416	7,482	7,478	7,905	7,892	7,807	7,795
Butadiene	2,912	1,722	1,721	1,680	1,678	1,650	1,648
Naphthalene	1,100	842	839	754	748	706	700
Polycyclic Organic Matter	565	276	276	239	239	231	231
Diesel Particulate Matter	27,664	5,947	5,982	5,138	5,270	5,069	5,201
Ethylbenzene	13,981	10,459	10,424	9,060	8,984	8,480	8,410

Note: Traffic data for the design year (2045) were used to conservatively estimate emissions during the horizon year (2040).

⁹ This analysis accounts for the effects of the US National Highway Traffic Safety Administration and Environmental Protection Agency SAFE (Safer Affordable Fuel-Efficient) Vehicles Rule. Part One revoking California's authority to set its own greenhouse gas emissions standards was published on September 27, 2019 and effective November 26, 2019. The SAFE Vehicles Rule Part 2 would amend existing Corporate Average Fuel Economy (CAFE) and tailpipe carbon dioxide emissions standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026. The proposal would retain the model year 2020 standards for both programs through model year 2026. The assumptions under the SAFE Vehicles Rule also affect criteria pollutant emissions. CARB has provided adjustment factors to be utilized in light of the SAFE Rule, and EPA approved the adjustment factors on March 12, 2020. The CARB adjustment factors were used in this analysis.

As shown in Table 2.2.5-4, daily MSAT emissions estimated for both the Build and No Build Alternatives would be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018), because federal and state vehicle emissions standards are expected to reduce pollutant emissions over time.

With the exception of diesel particulate matter, the estimated daily MSAT emissions for the Build Alternative during the opening year, horizon year, and design year scenarios would be approximately equal to or lower than the emissions for the No Build Alternative, because the Build Alternative would improve local traffic flow. Daily emissions of diesel particulate matter for the Build Alternative during the opening year, horizon year, and design year would be up to 2.6 percent higher than for the No Build Alternative; however, the levels would remain well below the existing level.

In conclusion, the modeling results show that the Build Alternative would not result in a substantial increase in MSAT emissions compared to the existing year conditions or the future No Build Alternative.

Asbestos

Geologic mapping indicates there are no areas of bedrock likely to contain naturally-occurring asbestos within the project area (Section 2.2.4.2). However, undocumented fill material used for roadway embankments could potentially contain naturally-occurring asbestos imported from other areas that could be excavated and released into the air during construction. Asbestos-containing materials may be present in roadway bridge and wall structures constructed before 1981. Demolition or alteration of structures and walls with asbestos-containing materials could pose a risk of releasing asbestos fibers into the environment. Implementation of Measure HAZ-1 described in Section 2.2.4.4 would ensure that potential asbestos in soil and building materials is investigated before construction and site-specific control measures are incorporated into the final project design to address the potential adverse effects to human health that could result from the disturbance of asbestos. Furthermore, demolition and removal of the possible asbestos-containing materials would be performed in accordance with local, state, and federal requirements.

Lead

As discussed in Section 2.2.4.2, the project could involve the potential disturbance of ADL in soils and lead-based paint on roadway markings. With implementation of Mitigation Measure HAZ-1, a lead compliance plan for ADL-contaminated soils and pavement markings containing lead will be prepared in accordance with Caltrans standards and implemented by the contractor(s). A certified contractor will remove all loose and peeling lead-based paint, if any. Caltrans Standard Specifications require that handling of material containing ADL must result in no visible dust migration and that Caltrans standard dust control measures be implemented.

Construction (Short-Term) Impacts

Construction Emissions for Project-Level Conformity

Project construction activities would generate emissions of criteria air pollutants and precursors that could potentially affect regional air quality. Project construction is anticipated to commence in early 2023 and would take approximately 32 months. Construction is not expected to

substantially impact traffic due to detours, road closures, or temporary terminations. Since construction activities will not last for more than 5 years at one general location, temporary emissions of CO, PM₁₀, and PM_{2.5} are not expected to cause, contribute to, or worsen any federal air quality violations and an evaluation of these emissions is not required for a project-level conformity determination (40 CFR 93.123(c)(5)).

Construction Criteria Air Pollutant Emissions

The BAAQMD considers construction activities to be typically short-term or temporary in duration; however, criteria pollutant emissions from construction of the Build Alternative were estimated for informational purposes. Construction emissions were quantified using the Sacramento Metropolitan Air Quality Management District's Roadway Construction Emissions Model (Version 8.1.0).

The BAAQMD's current CEQA Guidelines recommend thresholds of significance for project-level criteria air pollutant emissions to assist lead agencies in CEQA determinations. The BAAQMD's thresholds include levels at which construction emissions of O₃ precursors (ROG and NO_x), PM₁₀, and PM_{2.5} could cause significant air quality impacts. Since Caltrans has not established significance thresholds for criteria air pollutant emissions for CEQA purposes, the BAAQMD's recommended thresholds are included in Table 2.2.5-5 for comparison only.

Table 2.2.5-5: Construction Criteria Air Pollutant Emissions (Average Pounds per Day)

	ROG	NO _x	Exhaust PM ₁₀	Exhaust PM _{2.5}	Fugitive Dust PM ₁₀	Fugitive Dust PM _{2.5}
Construction Emissions	5	46	2	2	56	12
BAAQMD CEQA Thresholds¹	54	54	82	54	BMP	BMP

Notes: BMP = best management practices; NA= not available

Fugitive dust emissions include a 50 percent reduction from the use of watering trucks. However, additional reductions from implementation of dust-control measures listed under Section 5 cannot be readily quantified.

1. The BAAQMD's thresholds have not been adopted by Caltrans and are only shown for informational purposes.

Neither Caltrans nor the BAAQMD has a quantitative threshold for fugitive dust emissions; however, the BAAQMD considers implementation of BMPs to control fugitive dust PM₁₀ and PM_{2.5} during construction sufficient to reduce potential impacts from dust to a less-than-significant level. Caltrans' Special Provisions and Standard Specifications will include the requirement to minimize or eliminate dust through the application of water or dust palliatives.

Most of the construction impacts to air quality are short-term in duration and therefore will not result in long-term adverse conditions. Implementation of the following standardized measures, some of which may also be required for other purposes such as storm water pollution control, will reduce any air quality impacts resulting from construction activities:

- Water active construction areas as needed.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Stabilize access areas (i.e., temporary access roads or entrances/exits) with rock material and maintain as needed.

- Keep dust to a minimum during street sweeping activities. Use a vacuum whenever dust generation is excessive or sediment pickup is ineffective.
- Apply hydromulch, hydroseed, or soil stabilizers to disturbed areas if inactive for at least 14 days or before a forecasted rain event.
- Minimize stockpiles at job site. Cover active and inactive soil stockpiles and surround with a linear sediment barrier if inactive for at least 14 days or before a forecasted rain event. Water soil stockpiles as needed.
- 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 from construction equipment exhaust can be controlled by the following, in accordance with Caltrans Standard Specifications Section 7-1.02C “Emissions Reduction”:

- Keeping engines properly tuned.
- Limiting idling.

2.2.5.4 Avoidance, Minimization, and/or Mitigation Measures

No further avoidance, minimization, or mitigation is required.

Climate Change

Neither the USEPA nor FHWA has issued explicit guidance or methods to conduct project-level GHG analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and EOs on climate change, the issue is addressed in the CEQA chapter of this document. The CEQA analysis may be used to inform the NEPA determination for the project.

2.2.6 Noise and Vibration

2.2.6.1 Regulatory Setting

NEPA of 1969 and 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 rest of this section will focus on the NEPA/Title 23 Part 772 of the Code of Federal Regulations (23 CFR 772) noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA involvement (and Caltrans, as assigned), the Federal-Aid Highway Act of 1970 and its 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 2.2.6-1 lists the NAC for use in the NEPA/23 CFR 772 analysis.

Table 2.2.6-1: Noise Abatement Criteria

Activity Category	NAC, Hourly A- Weighted Noise Level, Leq(h) ¹	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.

Activity Category	NAC, Hourly A- Weighted Noise Level, Leq(h) ¹	Description of Activities
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.

Source: Caltrans 2011

1. Includes undeveloped lands permitted for this activity category.

Figure 2.2.6-1 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.

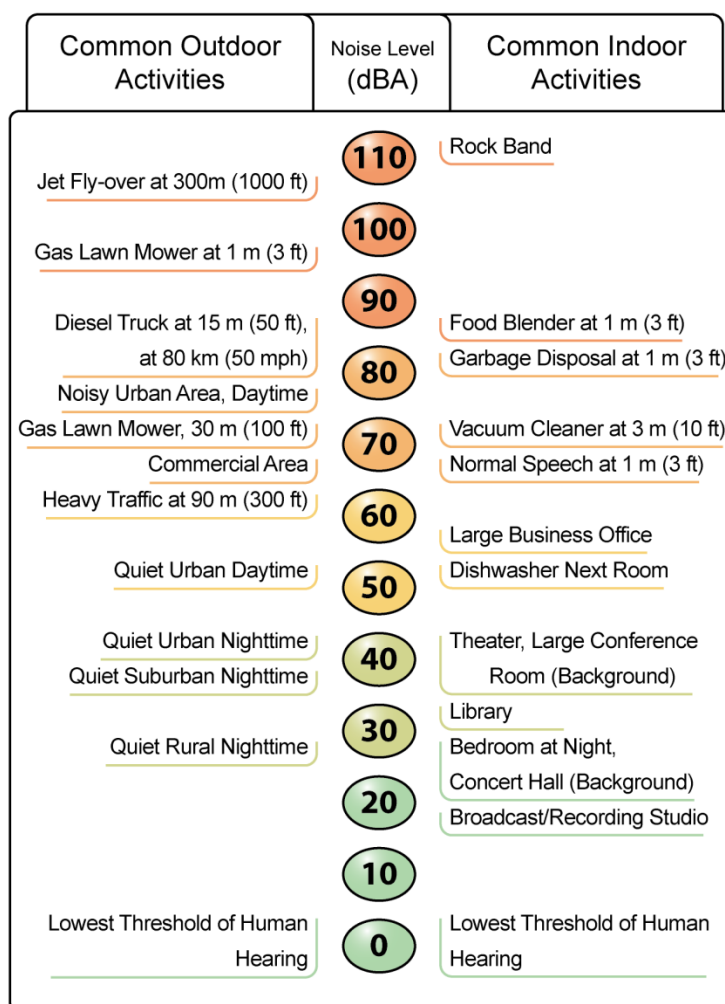


Figure 2.2.6-1: Noise Levels of Common Activities

According to the Caltrans *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 12 dBA or

more), or when the future noise level with the project approaches or exceeds the NAC. A noise level is considered to approach the NAC if it is 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 could be incorporated in the project.

The Caltrans TNAP sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. Noise abatement must be predicted to reduce noise by at least 5 dB at an impacted receptor to be considered feasible from an acoustical perspective. It must also be possible to design and construct the noise abatement measure for it to be considered feasible. Factors that affect the design and constructability of noise abatement include, but are not limited to, safety, barrier height, topography, drainage, access requirements for driveways, presence of local cross streets, underground utilities, other noise sources in the area, and maintenance of the abatement measure. The overall reasonableness of noise abatement is determined by the following three factors: 1) the noise reduction design goal of 7 dB at one or more benefited receptors; 2) the cost of noise abatement; and 3) the viewpoints of benefited receptors (including property owners and residents of the benefited receptors).

Local Criteria

Typically, work within the Caltrans right-of-way is not subject to local noise ordinances; however, Caltrans will work with the contractor to meet local requirements where feasible.

City of Pleasanton

The Health and Safety Code, Title 9, of the City's Municipal Code includes Noise Regulations in Chapter 9.04. Construction noise limits and allowable hours are indicated in Section 9.04.100, "Construction," which states:

Notwithstanding any other provision of this chapter, between the hours of 8:00 a.m. and 8:00 p.m. daily, except Sunday and holidays, when the exemption shall apply between 10:00 a.m. and 6:00 p.m., construction, alteration or repair activities which are authorized by a valid city permit shall be allowed if they meet at least one of the following noise limitations:

A. No individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible; or

B. The noise level at any point outside of the property plane of the project shall not exceed 86 dBA. (Prior code § 4-9.07(d))

City of Dublin

General noise restrictions are listed in the Noise Ordinance, Chapter 5.28, including a list of factors that may be determined to define "unreasonable noise." The Municipal Code does not appear to define allowable hours for construction or limit construction noise.

City of San Ramon

The Noise Control Code, Division B6, Chapter V, of the City’s Municipal Code includes a list of factors that may be determined to define whether a sound might disturb the peace. The Municipal Code does not appear to define allowable hours for construction or limit construction noise.

Alameda County

Exterior noise limits for unincorporated areas of Alameda County are established in Chapter 6.60, Section 6.60.040, Table 6.60.040A for residential, school, hospital, church, or public library land uses. However, construction noise is exempted from these limits during the allowable hours of 7 AM to 7 PM on weekdays and 8 AM to 5 PM on Saturday or Sunday.

Construction Vibration

Caltrans provides guidance to evaluate the effect of construction vibration on structures and for potential human annoyance (Caltrans 2013a), as shown below in Tables 2.2.6-2 and 2.2.6-3. Vibration levels are expressed as inches per second of peak particle velocity (in/sec PPV). For modern commercial buildings, guidance criteria are 2.0 in/sec PPV for transient sources and 0.5 in/sec PPV for continuous/intermittent sources. At lightweight, older structures that might contain plaster, the criteria are 0.5 in/sec PPV and 0.3 in/sec PPV, respectively. For annoyance, Caltrans guidance indicates that vibration is “distinctly perceptible” at 0.25 in/sec PPV for transient sources and 0.04 in/sec PPV for continuous sources; this would be applicable for nighttime construction.

Table 2.2.6-2: Maximum Vibration Levels to Prevent Damage for Various Building Types

Structure and Condition	Transient Sources (in/sec PPV)	Continuous/Frequent Intermittent Sources (in/sec PPV)
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans 2013a

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, vibratory pile drivers, and vibratory compaction equipment.

Table 2.2.6-3: Vibration Thresholds for Annoyance

Human Response	Transient Sources (in/sec PPV)	Continuous/Frequent Intermittent Sources (in/sec PPV)
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Source: Caltrans 2013a

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, vibratory pile drivers, and vibratory compaction equipment.

For vibration sensitive equipment, the criteria could be 0.004 in/sec PPV and lower (Caltrans 2013a), depending on the sensitivity of the equipment and whether vibration isolation tables are used for the equipment.

2.2.6.2 Affected Environment

The analysis summarized in this section is from the Noise Study Report and Noise Abatement Decision Report completed for the proposed project in December 2019 (Wilson Ihrig 2019; AECOM 2019c).

The noise study area encompasses all developed and undeveloped land uses surrounding the project limits, with a focus on noise-sensitive land uses. In general, noise-sensitive land uses include areas where serenity and quiet are of extraordinary significance, residential land uses, and other community uses such as hospitals, schools, cemeteries, and parks.

The existing noise environment throughout the project limits varies by location, depending on site characteristics such as proximity to other roadways or noise sources, the relative elevation of roadways and receptors, and any intervening structures or topography.

Noise Study Area

The majority of the noise study area is in the cities of Pleasanton, Dublin, San Ramon, and the community of Sunol. The noise study area was divided into eight sub-areas, generally divided by interchange features along I-680. The study areas are shown on Figure 2.2.6-2a and 2.2.6-2b and described further below.

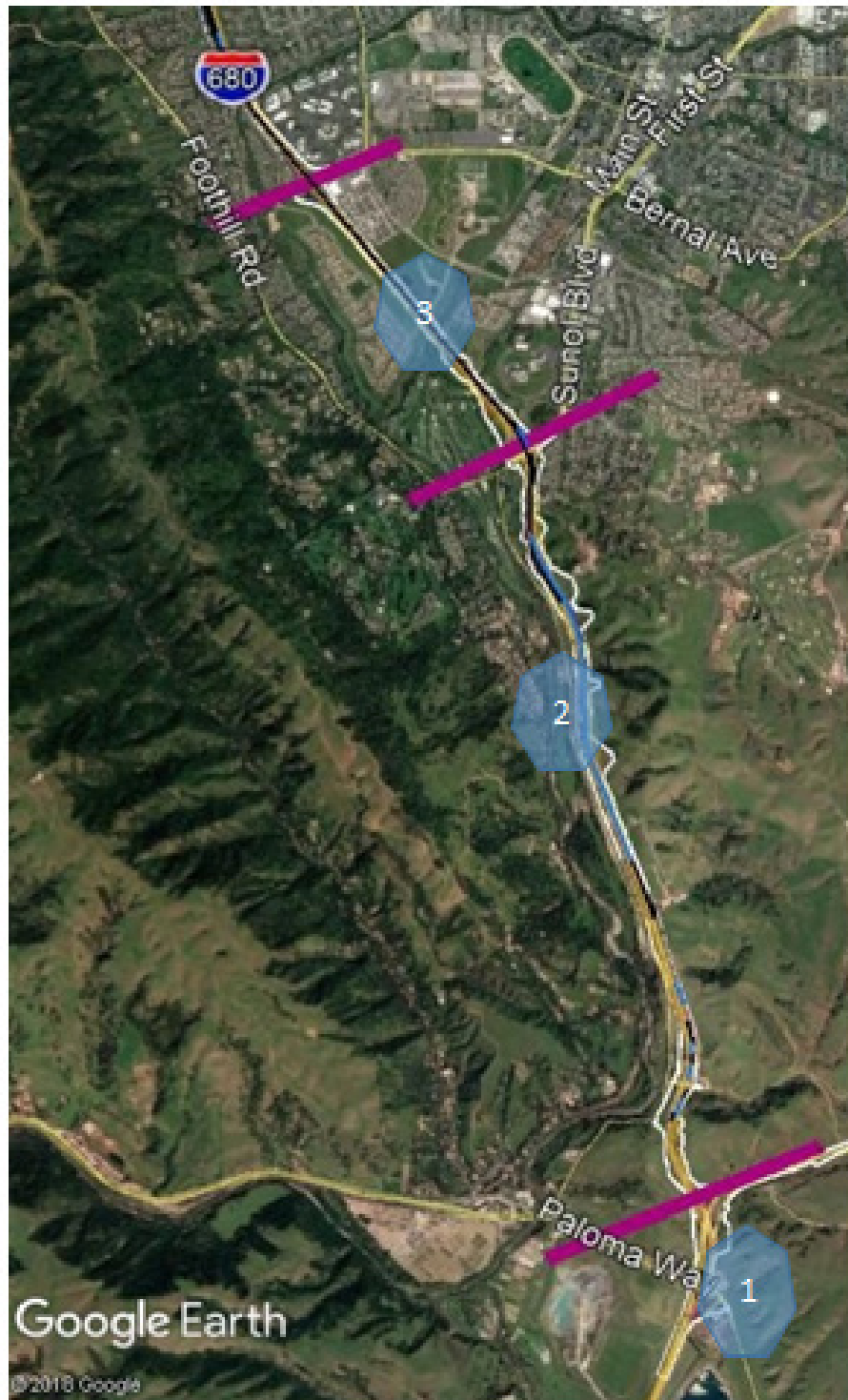


Figure 2.2.6-2a: Noise Analysis Sub-Areas 1 through 3, Aerial View

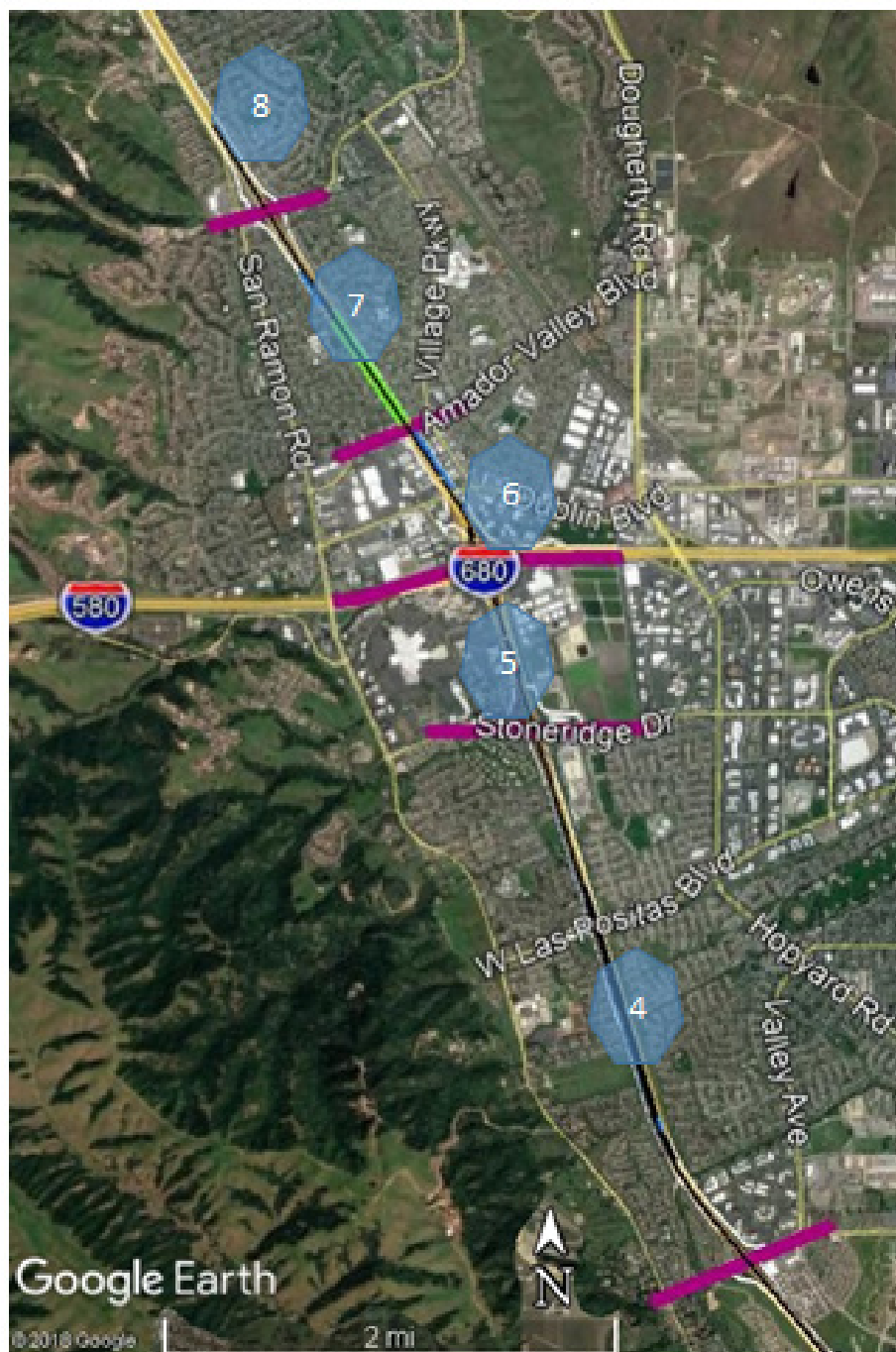


Figure 2.2.6-2b: Noise Analysis Sub-Areas 4 through 8, Aerial View

Sub-Area 1: I-680 from Calaveras Road to SR 84

The designated land use surrounding this segment is water management, and parts of this segment are in unincorporated Alameda County (Figure 2.2.6-2a). A retail nursery and small office building on Calaveras Road east of I-680 are adjacent to the project area. No noise-

sensitive receptors have been identified in the project area. In this segment, the project would connect with existing HOV/express lanes south of SR 84.

Study area lands in unincorporated Alameda County are subject to the East County Area Plan (Alameda County Community Development Agency 2002), which strictly limits growth in unincorporated areas of the county that do not fall within the general plan boundaries of Dublin, Livermore, Pleasanton, and a portion of Hayward. As there are no plans to develop these lands into noise-sensitive lands in the foreseeable future, no detailed analysis of this area is provided.

Sub-Area 2: I-680 from SR 84 to Sunol Boulevard

Most of the land uses near the project are resource management/water management and large parcel agricultural land, except for the northern project limit near the I-680/Sunol Boulevard interchange, which has commercial and residential properties (Figure 2.2.6-2a). There are residences on Pleasanton Sunol Road that would be in the vicinity of one or more new overhead signs for the HOV/express lanes. Except for these signs, which could be installed during nighttime hours, the project would re-stripe and widen the existing roadway in part of this segment to accommodate the northward extension of the HOV/express lanes. The project would also construct retaining walls on the northbound side, at various areas along Koopman Road. As noted previously, the land uses along the corridor that have not been developed are protected by planning policies that restrict growth; there are no plans to develop these lands into noise-sensitive lands in the foreseeable future. For these reasons, no additional modeling receptors were included in the unoccupied areas.

Sub-Area 3: I-680 from Sunol Boulevard to Bernal Avenue

Most of the land uses near the project are residential or open space/outdoor activity areas (Figure 2.2.6-2a). Thermo Fisher Scientific, a research and development facility, is on Arlington Drive just north of Sunol Boulevard. Residences near Sullivan Court would be in the vicinity of one or more new overhead signs for the HOV/express lanes. Except for these signs, which could be installed during nighttime hours, the project would re-stripe and widen the existing roadway in part of this segment to accommodate the northward extension of the HOV/express lane. The project would also widen the bridge and add a retaining wall at the Pleasanton Sunol Road undercrossing in the northbound direction.

Sub-Area 4: I-680 from Bernal Avenue to Stoneridge Drive

Most of the land uses near the project are residential or open space/outdoor activity areas and a school (Figure 2.2.6-2b). Residences on Tapestry Way, Elmwood Circle, and Shenandoah Court would be in the vicinity of one or more new overhead signs for the HOV/express lanes. Except for these signs, which could be installed during nighttime hours, the project would re-stripe and widen the existing roadway in part of this segment to accommodate the northward extension of the HOV/express lanes. The project would add a retaining wall in the northbound direction. The activity fields of Foothill High School are over 900 feet away from I-680.

Sub-Area 5: I-680 from Stoneridge Drive to I-580

The project would re-stripe and widen the existing roadway in part of this segment to accommodate the northward extension of the HOV/express lanes (Figure 2.2.6-2b). Residences on Stoneridge Drive and Payne Court would be in the vicinity of one or more new overhead signs for the HOV/express lanes or toll gantries; these could be installed during nighttime hours.

The American Baptist Church of the West is currently under construction approximately 150 feet from I-580 and over 700 feet from the school. On the east side of I-680, the Valley Bible Church is approximately 250 feet from I-680.

Sub-Area 6: I-680 from I-580 to Amador Valley Boulevard

The land uses near the project are industrial or commercial, with several outdoor areas at the commercial uses (Figure 2.2.6-2b). Residences lie farther east, at least 700 feet away. The project would re-stripe and widen the existing roadway in part of this segment to accommodate the northward extension of the HOV/express lanes. The project would add a retaining wall in the northbound direction. Commercial areas with outdoor uses include:

- McDonald's (seating), 7145 Dublin Boulevard, Dublin
- Rigatoni's Restaurant (seating), 7350 Dublin Boulevard, Dublin
- Citrus Indian Fusion (seating), 6830 Village Parkway, Dublin
- Casper's Hot Dogs (seating), 6998 Village Parkway, Dublin
- Starbucks (seating), 7904 Dublin Boulevard, Dublin
- The Habit (seating), 5291 Martinelli Way, Dublin

The following businesses also provide outdoor seating, but these are not a primary reason for customers to use these establishments:

- Autopia Car Wash (seating), 7240 Dublin Boulevard, Dublin
- Safeway (seating), 7499 Dublin Boulevard, Dublin

Land use in Sub-Area 6 is industrial and commercial. No measurements were conducted here, but several receptors were modeled at businesses with outdoor seating in this area.

Sub-Area 7: I-680 from Amador Valley Boulevard to Alcosta Boulevard

Land uses include residential and Dublin Elementary School (Figure 2.2.6-2b). The project would re-stripe and widen the existing roadway in part of this segment to accommodate the northward extension of the HOV/express lanes. The project may replace the existing sound walls along northbound and southbound I-680 in this area with new sound walls on top of retaining walls. Residences on Canterbury Lane and Ironwood Drive would be in the vicinity of one or more new overhead signs for the HOV/express lanes or toll gantries; these could be installed during nighttime hours. The closest building on the Resurrection Lutheran Church property lies some 120 feet west of the project. Outdoor activity fields for the Dublin Elementary School also lie some 120 feet away.

Sub-Area 8: I-680 North of Alcosta Boulevard

Most of the land uses near the project are residential with a commercial area just northwest of Alcosta Boulevard (Figure 2.2.6-2b). The project would re-stripe and widen the existing roadway in part of this segment to accommodate the northward extension of the southbound HOV/express lane.

Receptor Categories

Most of the receptors in the noise study area fall into Category B. A maximum peak hour noise level criteria of 67 dBA Equivalent Sound Level (L_{eq})¹⁰ applies at the exterior of residences (Category B). Recreational areas, active sports areas, and trails are classified as Category C. Most of the other land use is industrial (Category F) and commercial, for which there are few restaurants with exterior seating (Category E). Primary consideration for noise abatement is given to exterior areas where frequent human use occurs that would benefit from a lowered noise level. In general, an area of frequent human use is an area where people are exposed to traffic noise for an extended period on a regular basis.

Future Land Use Development

Future Category B and C land uses are also to be evaluated for noise impacts and abatement in the same manner as existing land uses if they are permitted before the date of approval of the final environmental decision document. For this analysis, land development is considered permitted “on the date that the land use (subdivision, residences, schools, churches, hospitals, libraries, etc.) has received all final discretionary approvals from the local agency with jurisdiction, generally the date that the building permit or vesting tentative map is issued” (Caltrans 2013b). In addition to five projects under environmental/planning review (see Section 2.1.1.2, Table 2.1.1-2), the following projects are under consideration:

- Two projects under construction
 - 6110/6120-6160 Stoneridge Mall, Pleasanton, office (Category E)
 - 6665 Amador Plaza Road, Dublin, school and outdoor play areas (Category D)
- Approved: 20801 San Ramon Valley Blvd., San Ramon, church (Category D)

Noise Measurements and Modeling

In January and March 2019, 16 short-term and two long-term field measurements were taken to document the existing outdoor noise environment within the noise study area. Additional short-term measurements at three locations and long-term measurements at two locations were collected in November 2016 for the SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 29763) in November 2016. Appendix D includes a map of the noise measurement locations. The estimated worst-hour noise levels at short-term locations were based on daytime measurement data, peak-hour traffic data (discussed further below), and the trends in hourly noise levels measured at nearby representative long-term measurement sites. A direct comparison of the data collected at the long-term and short-term noise measurement sites was made to calculate worst-hour noise levels at the short-term measurement locations. The short-term measurements were taken in conjunction with traffic counts, and this information was used to confirm that the traffic noise model accurately reflects the measured noise data. Noise

¹⁰ L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level ($L_{eq[h]}$) is the energy average of A-weighted sound levels occurring during a one-hour period, and is the basis for NAC used by Caltrans and FHWA.

measurement locations were used as noise modeling receivers for the prediction of existing and future worst-hour traffic noise levels using FHWA's Traffic Noise Model, Version 2.5.

The traffic volumes used for the model were based on free-flowing traffic (Level of Service [LOS] C) with 1,800 vehicles per lane per hour for general-purpose lanes and 1,650 vehicles per lane per hour for HOV/express lanes. Those volumes are considered the maximum capacities for these lane types. Maximum volumes generate the worst-case noise levels. The future (2045) No Build and Build scenarios assume a speed limit of 65 mph for automobiles and 55 mph for trucks on I-680.

The noise impact assessment was performed for the peak noise period. The peak noise period is not necessarily the time with peak traffic volumes. Congestion results in slower speeds, which substantially reduces traffic noise levels. The peak noise period is typically a time when traffic flows freely at or near-capacity conditions.

Existing noise levels were estimated to be up to 74 dBA, as described further in Section 2.2.6.3.

Human Response to Changes in Noise Levels

In typical noise environments (i.e., outside of an acoustical laboratory with controlled conditions), changes in noise of 1 to 2 dB are generally not perceptible. Sound level increases of 3 dB begin to be detectable in typical noise environments. A 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness (Wilson Ihrig 2019).

Decibels are logarithmic units, and therefore a doubling of sound energy corresponds to a 3 dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces noise at 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level that is 5 dB louder than one source. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3 dB increase in sound would generally be perceived as barely detectable (Wilson Ihrig 2019).

2.2.6.3 Environmental Consequences

The project has been determined to be a Type I project per 23 CFR 772.

Long-Term Noise Changes

Noise levels were modeled for the project design year, which is 2045 (20 years after the project's opening year). Noise levels were modeled for 58 receiver locations—modeled locations that can represent one or more dwelling units; labeled as “R”—throughout the project area. The results of the projections for the noise measurement locations and modeled receiver locations (shown in Appendix D) are provided in Table 2.2.6-4.

Table 2.2.6-4: Modeled Noise Levels

Study Area Segment	Receiver ID (Number of Receptors)	Location	NAC	Worst Hourly Noise Level (L _{eq} dBA) 2018 Existing	Worst Hourly Noise Level (L _{eq} dBA) 2045 No Project	Worst Hourly Noise Level (L _{eq} dBA) 2045 With Project ²	Noise Level Increases ¹ (dBA) With Project (2045) over Existing	Noise Level Increases ¹ (dBA) With Project over No Project
Sub-Area 2: SR 84 to Sunol Blvd	R-1 (1)	8855 Pleasanton Sunol Rd	67	64	65	66	2	1
Sub-Area 2: SR 84 to Sunol Blvd	R-2a (1)	Koopman Rd	67	67	67	69	2	2
Sub-Area 2: SR 84 to Sunol Blvd	R-3 (1)	7960 Pleasanton Sunol Rd	67	67	68	70	3	2
Sub-Area 2: SR 84 to Sunol Blvd	R-4 (4)	304 Happy Valley Rd	67	65	66	68	3	2
Sub-Area 2: SR 84 to Sunol Blvd	R-5 (8)	299 Sullivan Ct	67	59	60	61	2	1
Sub-Area 3: Sunol Blvd to Bernal Ave	R-6 (8)	6011 Sterling Greens Cir	67	59	59	61	2	2
Sub-Area 3: Sunol Blvd to Bernal Ave	R-7 (1)	Centennial Trail	67	73	74	75	2	1
Sub-Area 3: Sunol Blvd to Bernal Ave	R-8 (6)	Laguna Creek Ln	67	65	66	67	2	1
Sub-Area 3: Sunol Blvd to Bernal Ave	R-9 (30)	1666 W Lagoon Rd	67	60	61	62	2	1
Sub-Area 3: Sunol Blvd to Bernal Ave	R-9a (10)	W Lagoon Rd	67	61	61	63	2	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-10 (16)	Trotter Way	67	70	71	72	2	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-10a (15)	Minton Ct	67	70	70	71	1	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-11 (1)	Meadowlark Park	67	64	64	66	2	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-11a (2)	8155 Regency Dr	67	64	64	66	2	2

Study Area Segment	Receiver ID (Number of Receptors)	Location	NAC	Worst Hourly Noise Level (L _{eq} dBA) 2018 Existing	Worst Hourly Noise Level (L _{eq} dBA) 2045 No Project	Worst Hourly Noise Level (L _{eq} dBA) 2045 With Project ²	Noise Level Increases ¹ (dBA) With Project (2045) over Existing	Noise Level Increases ¹ (dBA) With Project over No Project
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-11b (12)	Regency Dr	67	68	69	70	2	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-11c (6)	Foothill Knolls Dr	67	66	67	68	2	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-12 (0)	Elmwood Cir - 1	N/A	69	69	71	2	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-12a (8)	Elmwood Cir - 2	67	65	65	66	1	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-12b (10)	Ashwood Ct	67	71	71	72	1	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-12c (5)	Amberwood Cir	67	70	71	72	2	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-12d (20)	Cloewood Ln	67	74	74	75	1	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-13 (1)	Muirwood Park - 1	67	70	70	72	2	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-13a (1)	Muirwood Park - 2	67	68	69	70	2	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-13b (8)	South Stonedale Dr	67	70	70	72	2	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-14 (25)	Stonedale Dr	67	62	63	64	2	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-15 (8)	Corte Monterey	67	57	58	60	3	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-16 (1)	Centennial Trail along Arroyo Creek	67	67	68	69	2	1

Study Area Segment	Receiver ID (Number of Receptors)	Location	NAC	Worst Hourly Noise Level (L _{eq} dBA) 2018 Existing	Worst Hourly Noise Level (L _{eq} dBA) 2045 No Project	Worst Hourly Noise Level (L _{eq} dBA) 2045 With Project ²	Noise Level Increases ¹ (dBA) With Project (2045) over Existing	Noise Level Increases ¹ (dBA) With Project over No Project
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-16a (8)	Corte Blanca	67	61	62	64	3	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-16b (9)	Corte de Flores	67	60	61	62	2	1
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-16c (23)	Petrified Forest Ct	67	61	61	63	2	2
Sub-Area 4: Bernal Ave to Stoneridge Drive	R-17 (21)	6895 Heath Ct	67	66	66	67	1	1
Sub-Area 5: Stoneridge Drive to I-580	R-18 (10)	6250 Stoneridge Mall Rd	67	66	67	68	2	1
Sub-Area 5: Stoneridge Drive to I-580	R-20 (1)	American Baptist Church of the West	67	64	65	65	1	0
Sub-Area 5: Stoneridge Drive to I-580	R-19 (1)	Valley Bible Church	67	68	69	69	1	0
Sub-Area 5: Stoneridge Drive to I-580	R-19a (1)	Centennial Trail	67	69	70	70	1	0
Sub-Area 6: I-580 to Amador Valley Blvd	R-21 (1)	The Habit outdoor seating	72	64	65	65	1	0
Sub-Area 6: I-580 to Amador Valley Blvd	R-22 (1)	Starbucks	72	62	63	63	1	0
Sub-Area 6: I-580 to Amador Valley Blvd	R-23 (1)	McDonalds	72	69	70	70	1	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-24 (23)	8264 Elgin Ln	67	63	64	64	1	0

Study Area Segment	Receiver ID (Number of Receptors)	Location	NAC	Worst Hourly Noise Level (L _{eq} dBA) 2018 Existing	Worst Hourly Noise Level (L _{eq} dBA) 2045 No Project	Worst Hourly Noise Level (L _{eq} dBA) 2045 With Project ²	Noise Level Increases ¹ (dBA) With Project (2045) over Existing	Noise Level Increases ¹ (dBA) With Project over No Project
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-24a (20)	Canterbury Ln	67	62	63	62	0	-1
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-24b (22)	Bedford Ct	67	62	63	62	0	-1
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-24c (20)	Wicklow Ln	67	60	61	61	1	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-25 (20)	Millbrook Ave	67	70	70	70	0	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-25a (38)	Ironwood Dr	67	65	65	65	0	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-25b (20)	Deervale Ct	67	66	66	66	0	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-25c (20)	Oliver Pl	67	62	62	62	0	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-26 (1)	Dublin Elementary School	67	63	63	63	0	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-26 (1)	Dublin Elementary (interior ³)	52	43	43	43	0	0
Sub-Area 7: Amador Valley Blvd to Alcosta Blvd	R-27 (1)	Resurrection Lutheran Church	67	65	66	66	1	0
Sub-Area 8: North of Alcosta Blvd	R-28 (13)	221 Kent Pl	67	66	67	67	1	0

Study Area Segment	Receiver ID (Number of Receptors)	Location	NAC	Worst Hourly Noise Level (L _{eq} dBA) 2018 Existing	Worst Hourly Noise Level (L _{eq} dBA) 2045 No Project	Worst Hourly Noise Level (L _{eq} dBA) 2045 With Project ²	Noise Level Increases ¹ (dBA) With Project (2045) over Existing	Noise Level Increases ¹ (dBA) With Project over No Project
Sub-Area 8: North of Alcosta Blvd	R-28a (13)	Corrinne Pl	67	61	62	62	1	0
Sub-Area 8: North of Alcosta Blvd	R-28b (27)	Northland Pl	67	65	65	65	0	0
Sub-Area 8: North of Alcosta Blvd	R-28c (4)	Tareyton Ave	67	68	69	68	0	-1
Sub-Area 8: North of Alcosta Blvd	R-28d (10)	Tareyton Ave (east)	67	67	68	68	1	0
Sub-Area 8: North of Alcosta Blvd	R-29 (10)	71 Foster Dr	67	60	61	62	2	1
Sub-Area 8: North of Alcosta Blvd	R-29a (8)	Palmer St	67	69	70	70	1	0
Sub-Area 8: North of Alcosta Blvd	R-30 (9)	Westside Dr	67	62	63	63	1	0

1. The results are shown in whole integers, which sometimes results in discrepancies due to rounding

2. **Boldfaced** = Approaches or exceeds the NAC

3. Assuming a 20 dBA noise reduction for light frame, closed sash windows.

No Build Alternative

The No Build Alternative would make no physical or operational changes to the project area that would affect noise or vibration levels. In 2045, increases in traffic are expected to increase overall noise levels for the no-project condition by 0 to 1 dBA over existing conditions at most locations.

Build Alternative

The Build Alternative is anticipated to increase future noise levels by 0 to 3 dBA over existing conditions and by 0 to 2 dBA over the No Build condition. However, projected highway noise levels for 2045 are expected to approach or exceed the NAC at a number of receivers in the study area. Therefore, noise abatement is considered in Section 2.2.6.4, below.

Long-term noise changes from phased construction of the Build Alternative (described in Section 1.4.1) would not exceed the levels shown in Table 2.2.6-4 for the full Build Alternative.

Short-Term Noise Changes

No Build Alternative

The No Build Alternative would not result in construction; therefore, no short-term noise impacts would occur.

Build Alternative

Project Construction Phases

Project construction would include concrete pavement construction, excavation, and grading; bridge widening; construction of drainage and storm water systems, retaining walls, guardrails and concrete barriers, including median barriers; miscellaneous concrete work; relocation of utilities; installation of electric conduit; paving; and installation of overhead signs and lighting. Construction noise would primarily result from the operation of heavy construction equipment and arrival and departure of heavy-duty trucks. The highest maximum instantaneous noise levels would result from special impact tools such as pile drivers. CIDH pile installation would generate much lower noise.

Locations where impact pile driving may be required and the nearest modeled receivers are as follows. Receiver locations are shown in Appendix D.

- Dublin Blvd undercrossing widening/BR-2 (R-23 and R-23a)
- Amador Valley Blvd undercrossing widening/BR-3 (R-21, R-22, R-27, and R-23a)
- RW 153 (R-1, R-2a, and R-3)
- RW 581 (R-22, R-23, and R-23a)
- RW 599 (R-24a and R-24b)
- RW 600 (R-25, R-25a, R-26, and R-27)

If the project is constructed in phases as described in Section 1.4.1, work related to RW 600 is anticipated to take place during Phase 1, and the remaining bridge widening and retaining wall work is anticipated to take place during Phase 2.

Table 2.2.6-5 lists estimated construction noise levels by phase, based on typical equipment and activity levels as identified in the FHWA Roadway Construction Noise Model (FHWA 2006) and the Caltrans Technical Noise Supplement (Caltrans 2013b). The noise produced by construction equipment dissipates over distance at a rate of about 6 dB per doubling of distance. As noted in Section 2.2.6.1 (under “Local Criteria”), the City of Pleasanton limits construction equipment noise to either 83 dBA at 25 feet or 86 dBA outside the property plane, which in this case is the Caltrans ROW. Therefore, Table 2.2.6-5 also includes the typical buffer distance to comply with the City of Pleasanton noise limit of 86 dBA outside of the ROW.

Table 2.2.6-5: Typical Construction Noise at 100 Feet Distance by Phase

Construction Phase	Maximum Sound Level (Lmax, dBA)	Hourly Average Noise Level (Leq[h], dBA)	Typical Buffer Distance to Achieve 86 dBA (feet)
Grubbing/land clearing	79	77	45
Grading/excavation	79	80	45
Drainage/utilities/subgrade	79	79	45
Paving	84	81	80
Restriping/scarifying	79	72	45
Concrete barrier	76	69	35
Structures (with impact pile driving)	89	83	145
Structures (CIDH piles)	79	77	45

Notes:

References obtained from FHWA use the louder 'specified' levels and not the 'actual' measured values; therefore, the results shown in Table 2.2.6-5 are considered conservative.

The *maximum sound level* is the loudest instantaneous sound for a single piece of equipment. The *hourly average noise level* was estimated by adding together the three loudest pieces of equipment. In most cases, the maximum sound level is higher than the hourly average noise level, with the exception of grading/excavation equipment. In the calculations for the grading/excavation phase, the combination of usage factor and selection of loudest pieces of equipment result in hourly average noise level values that are higher than any single piece of equipment.

Table 2.2.6-6 provides estimated daytime hourly average noise levels for the different construction phases at the nearest modeled receptors, along with the approximate distance between the receptor and the construction work. The estimated levels do not account for acoustic shielding from intervening buildings or existing sound walls except where noted.

Table 2.2.6-6: Estimated Daytime Construction Noise Levels

Modeled Receiver ID	Location	Grubbing/Clearing/Grading (Distance [feet])	Retaining Wall or Structure (Distance [feet])	Concrete Barrier (Distance [feet])	Grubbing/Clearing/Grading (dBA Leq)	Impact Pile Driving (dBA Leq)	Widening/Retaining Wall (no impact tools) (dBA Leq)	Concrete Work (dBA Leq)	Demolition (dBA Leq)
R-1	8855 Pleasanton Sunol Rd	390	490	490	68	69	63	55	55
R-2a	Koopman Rd	290	300	300	71	73	67	59	59
R-3	7960 Pleasanton Sunol Rd	430	520	520	67	69	63	55	55
R-4	304 Happy Valley Rd	75	1300	210	82	N/A	55	63	63
R-5	299 Sullivan Ct	75	815	190	82	N/A	59	63	63
R-6	6011 Sterling Greens Cir	525	2700	560	66	N/A	48	54	54
R-7	Centennial Trail	35	N/A	115	89	N/A	N/A	68	68
R-8	Laguna Creek Ln	380	N/A	495	68	N/A	N/A	55	55
R-9	1666 W Lagoon Rd	490	N/A	485	66	N/A	N/A	55	55
R-15	Corte Monterey ¹	290	N/A	390	61	N/A	N/A	57	57
R-16	Centennial Trail along Arroyo Creek	215	N/A	300	73	N/A	N/A	59	59
R-11	Meadowlark Park (near 8155 Regency Dr.)	230	405	335	73	N/A	65	58	58

Modeled Receiver ID	Location	Grubbing/Clearing/Grading (Distance [feet])	Retaining Wall or Structure (Distance [feet])	Concrete Barrier (Distance [feet])	Grubbing/Clearing/Grading (dBA L _{eq})	Impact Pile Driving (dBA L _{eq})	Widening/Retaining Wall (no impact tools) (dBA L _{eq})	Concrete Work (dBA L _{eq})	Demolition (dBA L _{eq})
R-12	Elmwood Cir - 1	40	N/A	135	88	N/A	N/A	66	66
R-12a	Elmwood Cir - 2	115	450	225	79	N/A	64	62	62
R-17	6895 Heath Ct ¹	340	N/A	275	59	N/A	N/A	60	60
R-13b	Stonedale	60	N/A	170	84	N/A	N/A	64	64
R-13a	Muirwood Park - 2	215	N/A	280	73	N/A	N/A	60	60
R-18	6250 Stoneridge Mall Rd	75	N/A	275	82	N/A	N/A	60	60
R-21	The Habit	500	500	500	66	69	63	55	55
R-22	Starbucks	450	500	500	67	69	63	55	55
R-23	McDonalds	230	265	265	73	75	68	61	61
R-23a	Portage/Maple	715	715	715	63	66	59	52	52
R-24	8264 Elgin Ln	25	50	130	92	89	83	67	75
R-24a	Canterbury Ln	10	20	20	100	97	90	83	83
R-24b	Bedford Ct	10	20	20	100	97	90	83	83
R-25	Millbrook Ave	20	45	135	94	90	83	66	76
R-25a	Ironwood Dr	40	50	50	88	89	83	75	75
R-26	Dublin Elementary School yard	400	430	430	68	70	64	56	56
R-26	Dublin Elementary School - inside portables	450	480	480	47	47	63	35	55
R-27	Lutheran Church	80	100	100	62	83	77	49	69
R-28	221 Kent Pl	N/A	N/A	120	N/A	N/A	N/A	67	67
R-29	71 Foster Dr	N/A	N/A	430	N/A	N/A	N/A	56	56

1. Existing barrier to stay in place; 10 dBA noise reduction included
N/A = Construction phase not proposed in vicinity of receptor

Construction noise for all receptors would be short-term and intermittent, except in the area between Amador Valley Boulevard and Alcosta Boulevard (discussed further under “Barrier Replacement Locations,” below). As shown in Table 2.2.6-6, high temporary noise levels may occur at receptors near locations where pile driving and other construction activities are proposed.

Construction noise levels at the interior of Dublin Elementary School could potentially exceed an hourly L_{eq} of 52 dBA during demolition work, impact pile driving, and retaining wall and sound wall construction. If such work must be conducted on school days during school hours, temporary construction sound control would be necessary, as feasible, to block line of sight between the construction equipment/construction noise and the school buildings.

Some work, such as bridge widening and construction of retaining walls and sound walls, could require nighttime impact pile driving or installation of CIDH piles to minimize traffic disruption. Table 2.2.6-7 compares existing daytime and nighttime noise levels with potential construction

noise levels at four representative locations where long-term noise measurements were conducted.

Table 2.2.6-7: Comparison of Construction Noise with Existing Conditions at Long-Term Noise Measurement Locations

Receiver ID (Location)	Existing Noise (Day/Night), dBA	Local Jurisdiction Noise Limit, dBA	Grubbing/ Clearing/ Grading, dBA	Impact Pile Driving, dBA	Widening/ Retaining Wall (no impact tools), dBA	Concrete Work, dBA	Demolition, dBA
R-1 (8855 Pleasanton Sunol Rd)	62/58	None	68	69	63	55	55
R-3 (7960 Pleasanton Sunol Rd)	70/66	None	67	69	63	55	55
R-12a (Elmwood Cir – 2)	73/70	86 dBA	79	Not proposed	64	62	62
R-24 (8264 Elgin Ln)	63/59	None	92	89	83	67	75

Impacts from pile driving at any one location would be short term, and the pile driving in all but one location (RW-600) is anticipated to take place during Phase 2, if the project is constructed in phases as described in Section 1.4.1. As demonstrated by the existing levels at R-24 shown in Table 2.2.6-7, however, impact pile driving would generate substantially higher hourly noise levels than the existing nighttime noise level. Measure NOI-1 (Section 2.2.6.4, under “Short-Term [Construction] Noise”) includes that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9 PM and 6 AM and limits pile driving activities to between 7 AM and 7 PM, where feasible.

Barrier Replacement Areas

Construction noise for all receptors would be short-term and intermittent, except in the area between Amador Valley Boulevard and Alcosta Boulevard. As described in Section 1.4.1.4, the project may require removing and reconstructing part of two sound walls on retaining walls: RW-599, which could be moved by up to 22 feet to the east to accommodate the northbound express lane (Barrier 13–Relocated; Phase 2 if project is constructed in phases); and RW-600, which could be moved by approximately 8 to 15 feet to the west to accommodate the southbound express lane (Barrier 14A–Relocated; Phase 1 if project is constructed in phases). Space constraints in the ROW may not allow for the reconstructed walls to be built before the existing walls are removed.

Without sound walls in place and without other construction noise, the temporary noise increase is estimated at up to 6 dBA.¹¹ The duration of the temporary noise increase could be minimized by removing and reconstructing the new barriers in segments to reduce the number of receptors

¹¹ As shown in Table 2.2.6-8, below, for Barriers 13–Relocated and 14A–Relocated with the “no barrier” scenario, the noise level would increase by up to 6 dBA compared to the 10-foot-high barrier scenario, which represents the existing condition.

that would be exposed to freeway noise. If the new barriers were constructed in segments, the temporary noise increase could last approximately 3 months at each location. Measure NOI-1 (Section 2.2.6.4, under “Short-Term [Construction] Noise”) includes that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9 PM and 6 AM and limits pile driving activities to between 7 AM and 7 PM, where feasible.

Construction Noise by Phased Project Implementation

Short-term noise impacts from phased implementation of the Build Alternative (described in Section 1.4.1) would not exceed the range described for the full Build Alternative.

Construction Vibration

Impact pile driving can generate noticeable vibration of up to 0.65 in/sec PPV at 25 feet, and vibratory roller equipment for earthmoving and soil compaction can generate vibration of up to 0.21 in/sec PPV at 25 feet (Caltrans 2013a). Assuming typical hard soils, vibration from these activities would reduce to 0.303 in/sec PPV and 0.098 in/sec PPV at 50 feet, respectively. At a distance of 500 feet—the approximate distance between I-680 and closest technology buildings in the business park on Arlington Drive—the vibration would further reduce to 0.024 in/sec PPV and 0.008 in/sec PPV, respectively.

Impact pile driving is not proposed in the vicinity of the technology buildings in the business park on Arlington Drive, but vibratory rollers would be used for soil compaction. At a distance of 500 feet, vibratory roller use would not be perceptible and no structural damage would occur (based on the thresholds listed in Tables 2.2.6-2 and 2.2.6-3). However, vibration sensitive equipment could be affected at 0.004 in/sec PPV and lower (Caltrans 2013a), depending on the sensitivity of the equipment and whether vibration isolation tables are used.

2.2.6.4 Avoidance, Minimization, and Abatement Measures

Traffic Noise Abatement Evaluation

Receiver locations that approach or exceed the NAC must be evaluated for potential abatement measures. Noise abatement is considered only where frequent human use occurs and where a lowered noise level would be of benefit. Noise abatement must be predicted to provide at least a 5 dBA minimum reduction at an impacted receptor to be considered feasible by Caltrans (i.e., the barrier would provide a noticeable noise reduction). Additionally, the TNAP acoustical design goal states that the noise barrier must provide at least 7 dBA of noise reduction at one or more benefited receptors. Noise abatement measures that provide noise reduction of more than 5 dBA are encouraged as long as they meet the reasonableness guidelines. The cost is based on the 2019 allowance per benefited receptor of \$107,000.

As shown in Table 2.2.6-4, projected noise levels for the 2045 design year are expected to approach or exceed the NAC at several receivers with both the No Build and Build Alternatives. These areas qualify for evaluation of abatement measures because a traffic noise impact would occur.

Reducing traffic noise levels at these locations would require construction of a barrier. The barrier would have to be high enough to effectively block the line of sight between the outdoor

use areas of these properties and the freeway traffic. Given the space available, these barriers would be masonry sound walls rather than earth berms. Noise barriers within the State ROW are typically constructed to meet the criteria in Chapter 1100 of the *Highway Design Manual* (Caltrans 2015b). The manual states that noise barriers should not be higher than 14 feet above the pavement when located within 15 feet of the edge of the traveled way, and 16 feet when located more than 15 feet from the edge of the traveled way. In some cases, an existing barrier already provides some noise reduction.

Existing noise barriers were evaluated at the current barrier locations if they are within or near the state ROW. Barriers in the form of new sound walls on top of retaining walls in Dublin would be slightly shifted from their current locations due to project requirements at the ROW or structure. Tables 2.2.6-9a through 2.2.6-15 present the results of the barrier analysis. Barrier and receiver locations are shown in Appendix D.

Phased implementation of the project (described in Section 1.4.1) would not result in future noise levels above those shown in Tables 2.2.6-9a through 2.2.6-14 for the full Build Alternative.

Existing Barriers

All existing barriers were evaluated for their ability to achieve the feasibility and reasonableness criteria. Of these, three barriers currently meet the feasibility and reasonableness criteria, as shown in Table 2.2.6-8.

- Barrier 9 (Sub-Area 4, Bernal Avenue to Stoneridge Drive; southbound along Elmwood Circle): The existing 8- to 12-foot-high barrier benefits 23 receptors, as shown in Table 2.2.6-8, represented by receivers R-12a, R-12b, and R-12c. The future noise is expected to approach or exceed the NAC. There is an existing 8- to 12-foot-high sound wall protecting these homes that generally follows the Caltrans ROW except for the northern end along Amberwood Circle, where the wall follows the residential property line outside the ROW. Table 2.2.6-8 lists the estimated noise reduction from modeled Barrier 9 at the existing sound wall location. The existing sound wall provides the minimum 5 dBA noise reduction and provides a 7 dBA reduction for at least one receptor. Based on this preliminary assessment, the existing configuration would be feasible as it provides the minimum 5 dBA reduction and reasonable because it also meets the 7 dBA acoustical design goal for at least one home.
- Barrier 14B (Sub-Area 7, Amador Valley Boulevard to Alcosta Boulevard; southbound I-680): The existing 10-foot-high barrier currently benefits 40 receptors, as shown in Table 2.2.6-8, represented by receivers R-25 and R-25b. This barrier also requires the presence of Barrier 14A or 14A–Relocated. With existing Barrier 14B, receivers near Millbrook Avenue (R-25) and Deervale Court (R-25b) receive a substantial noise reduction that exceeds the 5 dBA feasibility threshold and also meets the 7 dBA acoustical design goal for at least one receptor. Based on the preliminary assessment, maintaining the existing height would be feasible as it would provide the minimum 5 dBA reduction and reasonable because at least one receptor would receive a 7 dBA noise reduction.
- Barrier 15 (Sub-Area 8, North of Alcosta Boulevard; northbound I-680): The existing 10-foot-high barrier currently benefits 27 receptors as shown in Table 2.2.6-8, represented

by receivers R-28, R-28c and R-28d. At locations R-28 and R-28c, the future noise is expected to approach or exceed the NAC. The southern half of the sound wall follows the Caltrans ROW, and the northern half is within the ROW. Table 2.2.6-8 lists the estimated noise reduction from the modeled Barrier 15 at the existing sound wall location.

Receivers already receive a substantial noise reduction that exceeds the 5 dBA feasibility threshold and meets the 7 dBA acoustical design goal for at least one receptor. Based on this preliminary assessment, maintaining the existing height would be feasible as it would provide the minimum 5 dBA reduction and reasonable because at least one receptor would receive a 7 dBA noise reduction.

Table 2.2.6-8: Existing Barriers that Achieve Feasibility and Reasonableness Criteria

Barrier	Location (Number of Benefited Receptors)	Height (feet)	2045 Noise Level at Receiver	Noise Reduction at Receiver
Receiver R-12a				
Barrier 9: Elmwood	Elmwood Cir – 2 (8)	0 (no barrier)	72	N/A
Barrier 9: Elmwood	Elmwood Cir – 2 (8)	8 ^a	66	-6
Receiver R-12b				
Barrier 9: Elmwood	Ashwood Ct (10)	0 (no barrier)	79	N/A
Barrier 9: Elmwood	Ashwood Ct (10)	10 ^a	72	-7
Receiver R-12c				
Barrier 9: Elmwood	Amberwood Cir (5)	0 (no barrier)	78	N/A
Barrier 9: Elmwood	Amberwood Cir (5)	8 ^a	72	-6
Receiver R-25b				
Barrier 14B: Deervale	Deervale Ct (20)	0 (no barrier)	77	N/A
Barrier 14B: Deervale	Deervale Ct (20)	10 ^a	66	-11
Receiver R-25				
Barrier 14B: Millbrook	Millbrook Ave (20)	0 (no barrier)	77	N/A
Barrier 14B: Millbrook	Millbrook Ave (20)	10 ^a	70	-7
Receiver R-28				
Barrier 15: Kent	221 Kent Pl (13)	0 (no barrier)	82	N/A
Barrier 15: Kent	221 Kent Pl (13)	10 ^a	67	-15
Receiver R-28c				
Barrier 15: Kent	Tareyton Ave (4)	0 (no barrier)	73	N/A
Barrier 15: Kent	Tareyton Ave (4)	10 ^a	68	-5
Receiver R-28d				
Barrier 15: Kent	Tareyton Ave – East (10)	0 (no barrier)	75	N/A
Barrier 15: Kent	Tareyton Ave – East (10)	10 ^a	68	-7

^a Height of existing sound wall

For existing Barriers 6 and 11, where increasing the barrier height would be beneficial to achieve the feasibility and reasonableness criteria, the barriers would need to be replaced because the

existing foundations would not support the additional weight. Per noise analysis guidelines, existing barriers that would be raised in height and replaced require a full barrier analysis as required for new barriers, and those analyses are provided below.

Barrier Analyses: Sub-Area 2, SR 84 to Sunol Boulevard

Barrier 1A: Pleasanton Sunol Road (southbound). At location R-1, a residence, the future noise is expected to approach or exceed the NAC. There is currently no wall protecting this home. Table 2.2.6-9a lists the estimated noise reduction from modeled Barrier 1A at the edge of the pavement in the southbound direction. The topography and geometry of the roadway are not conducive to reducing sound levels using a sound wall. Based on preliminary assessment, a noise barrier would not be feasible, as it would not provide the minimum 5 dBA reduction.

Table 2.2.6-9a: Acoustical Effectiveness Analysis for Barrier 1A (Location R-1)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-1 (1 receptor)	-1	-1	-2	-3	-3	-4
Total benefited receptors	0	0	0	0	0	0
Total allowance	\$0	\$0	\$0	\$0	\$0	\$0

Barrier 1B: Koopman Road. There is currently no wall protecting the residence at location R-2a on Koopman Road, and the future noise is expected to approach or exceed the NAC. Table 2.2.6-9b lists the estimated noise reduction from modeled Barrier 1 at the edge of the pavement in the northbound direction. The topography and geometry of the roadway are not conducive to reducing sound levels using a sound wall. Based on the preliminary assessment, even though a 16-foot-high sound wall would be feasible as it would provide the minimum 5 dBA reduction, it would not be reasonable because it would not meet the 7 dBA design goal.

Table 2.2.6-9b: Acoustical Effectiveness Analysis for Barrier 1B (Location R-2a)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-2a (1 receptor)	0	-1	-2	-3	-4	-5
Total benefited receptors	0	0	0	0	0	N/A
Total allowance	\$0	\$0	\$0	\$0	\$0	\$0

Barrier 2: Pleasanton Sunol Road (northbound). At location R-3, the residence on Pleasanton Sunol Road east of the freeway, the future noise is expected to approach or exceed the NAC. There is no wall protecting this home. Table 2.2.6-9c lists the estimated noise reduction from the modeled Barrier 2 at the edge of the pavement in the northbound direction. The topography and geometry of the roadway are not conducive to reducing noise levels using a sound wall. Based on the preliminary assessment, this barrier would not be feasible, as it would not provide the minimum 5 dBA reduction.

Table 2.2.6-9c: Acoustical Effectiveness Analysis for Barrier 2 (Location R-3)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-3 (1 receptor)	0	-1	-1	-2	-3	-4
Total benefited receptors	0	0	0	0	0	0
Total allowance	\$0	\$0	\$0	\$0	\$0	\$0

Barrier 3: Happy Valley Road. At location R-4, residences on Happy Valley Road east of the freeway, the future noise is expected to approach or exceed the NAC, and there is no wall protecting these homes. Table 2.2.6-9d lists the estimated noise reduction from modeled Barrier 3 at the edge of the structure in the northbound direction. Based on this preliminary assessment, the topography and geometry of the roadway would be effective to reduce sound levels with a sound wall. A 12-foot-high barrier would be feasible as it would provide the minimum 5 dBA reduction, and it would be considered reasonable because at least one home would also receive a 7 dBA reduction.

Table 2.2.6-9d: Acoustical Effectiveness Analysis for Barrier 3 (Location R-4)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-4 (4 receptors)	-3	-5	-6	-8	-9	-9
Total benefited receptors	0	N/A	N/A	4	4	4
Total allowance	\$0	\$0	\$0	\$428,000	\$428,000	\$428,000

Barrier Analyses: Sub-Area 3, Sunol Boulevard to Bernal Avenue

Barrier 4: Trail-Township (east). At location R-7, the trail that fronts the east side of I-680 at the Township development and at R-7a (Plymouth Avenue), the future noise is expected to exceed the NAC. There is no sound wall protecting the trail. A partial sound wall provides a minor amount of benefit to a small grass area at the southwest corner of the Township development. The Township development has no ground-level patios or yards facing I-680. Table 2.2.6-10a lists the estimated noise reduction from the modeled Trail-Township Barrier (Barrier 4) at the ROW. The topography and geometry of the roadway are conducive to reducing sound levels using a sound wall at the pavement edge along the edge of the shoulder in the northbound direction. Based on the preliminary assessment, a 10-foot sound wall would be feasible as it would provide the minimum 5 dBA reduction, and it would be reasonable because the trail would also achieve a 9 dBA noise reduction.

Table 2.2.6-10a: Acoustical Effectiveness Analysis for Barrier 4 (Location R-7)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-7 (1 receptor)	-6	-6	-9	-10	-11	-12
Total benefited receptors	N/A	N/A	1	1	1	1
Total allowance	\$0	\$0	\$107,000	\$107,000	\$107,000	\$107,000

Barrier 5: Laguna Creek Lane (west). At location R-8, the future noise is expected to approach or exceed the NAC. There is no sound wall protecting these homes, but there is a large earth berm to the north, which tapers down to allow passage of Laguna Creek Lane under I-680. Table 2.2.6-10b lists the estimated noise reduction from the modeled Laguna Creek barrier (Barrier 5) on the I-680 structure that crosses over Laguna Creek Lane. The topography and geometry of the roadway are conducive to reducing sound levels using a sound wall. Based on the preliminary assessment, a 12-foot-high sound barrier would be feasible as it would provide

the minimum 5 dBA reduction, and it would be reasonable because at least one receptor would receive a 7 dBA noise reduction.

Table 2.2.6-10b: Acoustical Effectiveness Analysis for Barrier 5 (Location R-8)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-8 (6 receptors)	-5	-5	-6	-8	-8	-9
Total benefited receptors	N/A	N/A	N/A	6	6	6
Total allowance	\$0	\$0	\$0	\$642,000	\$642,000	\$642,000

Barrier Analyses: Sub-Area 4, Bernal Avenue to Stoneridge Drive

Barrier 6: Southbound before Bernal Avenue. At locations R-10 and R-10a, the future noise is expected to approach or exceed the NAC. There is an existing 10-foot-high sound wall protecting these homes outside of the Caltrans ROW. Table 2.2.6-11a lists the estimated noise reduction from modeled Barrier 6 at the existing sound wall locations. The topography and geometry of the roadway are conducive to reducing noise levels using a sound wall in the northern portion of this area. Based on preliminary assessment, a replacement 14-foot-high barrier near location R-10a would be feasible as it would provide the minimum 5 dBA reduction, and it would be reasonable because at least one home would receive a 7 dBA reduction.

Table 2.2.6-11a: Acoustical Effectiveness Analysis for Barrier 6 (Locations R-10 and R-10a)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-10 (16 receptors)	0	-1	-1	-2	-2	-3
Noise reduction (dBA) at R-10a (15 receptors)	0	-3	-5	-6	-8	-9
Total benefited receptors	0	0	N/A	N/A	15	15
Total allowance	\$0	\$0	\$0	\$0	\$1.61M	\$1.61M

Barrier 8: Southbound along Regency Drive. The future noise level is expected to approach or exceed the NAC at locations R-11a, R-11b, and R-11c. There is currently an 8- to 12-foot-high sound wall protecting these homes along the Caltrans ROW. Table 2.2.6-11b lists the estimated noise reduction from the modeled Barrier 8 at the existing sound wall location. A 14- to 16-foot-high sound wall would reduce the sound by 5 dBA or more compared to the no-barrier condition; however, no modeled sound wall would provide a 7 dBA reduction at any receptor. Based on this preliminary assessment, a 14-foot-high barrier would be feasible as it would provide the minimum 5 dBA reduction, but neither 14-foot nor 16-foot-high barriers would be reasonable.

Table 2.2.6-11b: Acoustical Effectiveness Analysis for Barrier 8 (Locations R-11, R-11a, R-11b, and R-11c)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-11 (1 receptor)	0	-1	-2	-3	-5	-6
Noise reduction (dBA) at R-11a (2 receptors)	0	-1	-2	-3	-5	-6
Noise reduction (dBA) at R-11b (12 receptors)	0	0	-2	-3	-4	-6
Noise reduction (dBA) at R-11c (6 receptors)	0	-1	-2	-3	-4	-6
Total benefited receptors	0	0	0	0	N/A	N/A

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Total allowance	\$0	\$0	\$0	\$0	\$0	\$0

Barrier 10: Southbound along Muirwood Park. At locations R-12d, R-13, R-13a, and R-13b, the future noise is expected to approach or exceed the NAC. There is a 10-foot-high sound wall protecting these homes within the Caltrans ROW. Table 2.2.6-11c lists the estimated noise reduction from the modeled Barrier 10 at the existing sound wall location, including at location R-14, which does not approach the NAC. Raising the height of the existing barrier to 14 or 16 feet would be feasible because it would provide the minimum 5 dBA reduction and reasonable because it would provide a 7 dBA or greater reduction at location R-14. Although the future noise level at location R-14 does not approach or exceed the NAC, it is considered a benefited receptor because it would receive a greater than 5 dBA reduction from Barrier 10, and therefore is included in the determination of the reasonable allowance since there are other benefited receptors.

Table 2.2.6-11c: Acoustical Effectiveness Analysis for Barrier 10 (Locations R-12d, R-13, R-13a, R-13b, and R-14)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-12d (20 receptors)	0	0	-1	-2	-3	-5
Noise reduction (dBA) at R-13 (1 receptor)	0	0	-1	-3	-5	-6
Noise reduction (dBA) at R-13a (1 receptor)	0	0	-1	-2	-3	-5
Noise reduction (dBA) at R-13b (8 receptors)	0	0	-1	-3	-5	-6
Noise reduction (dBA) at R-14 (25 receptors) ^a	-5	-6	-7	-8	-9	-10
Total benefited receptors	N/A	N/A	N/A	N/A	34	55
Total allowance	\$0	\$0	\$0 ^b	\$0 ^b	\$3.64M	\$5.89M

^a For determining total benefited receptors only; this location does not approach or exceed the NAC and would therefore not qualify for a noise barrier on its own, thus no cost allowance is shown until impacted receivers are benefited (R-13 and R-13b)

^b Receptor R-14 does not approach or exceed the NAC, and therefore does not qualify for a noise barrier on its own despite reaching the 7 dBA reduction criteria. No total allowance is calculated until a receptor that approaches/exceeds the NAC is benefited, which occurs at 14 feet.

Barrier 7A: Northbound north of West Las Positas Boulevard (Centennial Trail). At location R-16, the future noise is expected to approach or exceed the NAC. Table 2.2.6-11d lists the estimated noise reduction from the modeled Barrier 7A within the ROW at the edge of the northbound I-680 pavement. Based on the preliminary assessment, the modeled 14- and 16-foot-high barriers would be feasible as they would provide the minimum 5 dBA reduction, but only a 16-foot-high barrier would be reasonable and provide one receptor (the trail) with a 7 dBA reduction.

Table 2.2.6-11d: Acoustical Effectiveness Analysis for Barrier 7A (Locations R-16 and R-16a)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-16 (1 receptor)	-2	-3	-4	-5	-6	-7
Noise reduction (dBA) at R-16a (8 receptors)	-2	-3	-3	-4	-5	-5
Total benefited receptors	0	0	0	N/A	N/A	9
Total allowance	\$0	\$0	\$0	\$0	\$0	\$963,000

Barrier 7B: Northbound north of West Las Positas Boulevard (Heath Court). At location R-17, the future noise is expected to approach or exceed the NAC. There is a private 8-foot-high sound wall protecting these homes east of Alameda County Flood Control District property, well beyond the Caltrans ROW. Table 2.2.6-11e lists the estimated noise reduction from the modeled Barrier 7B within the ROW at the edge of the northbound I-680 pavement. Based on the preliminary assessment, the modeled 14- and 16-foot-high barriers would be feasible as they would provide the minimum 5 dBA reduction, but they would not be reasonable as they would not provide any homes with a 7 dBA reduction.

Table 2.2.6-11e: Acoustical Effectiveness Analysis for Barrier 7B (Location R-17)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-17 (21 receptors)	-1	-2	-1	-4	-5	-5
Total benefited receptors	0	0	0	0	N/A	N/A
Total allowance	\$0	\$0	\$0	\$0	\$0	\$0

Barrier Analyses: Sub-Area 5, Stoneridge Drive to I-580

Barrier 11: Southbound along I-680 on-ramp. At location R-18, the future noise is expected to approach or exceed the NAC. There is an 8-foot sound wall protecting these homes along the Caltrans ROW. The Build Alternative would not affect the sound wall. Table 2.2.6-12a lists the estimated noise reduction from the modeled Barrier 11 at the existing sound wall location. Based on this preliminary assessment, the existing configuration is feasible as it would provide the minimum 5 dBA reduction, but no homes currently benefit from a 7 dBA reduction. Increasing the height to 10 feet would be feasible because it would provide a 5 dBA noise reduction and reasonable because it would also provide a 7 dBA reduction for at least one receptor. Thus, the height of the existing barrier would need to be increased by 2 feet. To accommodate this height increase, this barrier would be replaced if other reasonable criteria are met.

Table 2.2.6-12a: Acoustical Effectiveness Analysis for Barrier 11 (Location R-18)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-18 (10 receptors)	-4	-5	-7	-8	-9	-9
Total benefited receptors	0	N/A	10	10	10	10
Total allowance	\$0	\$0	\$1.07M	\$1.07M	\$1.07M	\$1.07M

Barrier 12: Northbound along I-680 off-ramp. At locations R-19 and R-19a, the future noise is expected to approach or exceed the NAC. There is no sound wall in this area. Table 2.2.6-12b lists the estimated noise reduction from the modeled Barrier 12 at the edge of the roadway along the Caltrans ROW. Based on this preliminary assessment, a 14- or 16-foot-high sound wall would be feasible as it would provide the minimum 5 dBA reduction, but neither wall height would be reasonable as no receptors would receive a 7 dBA reduction.

Table 2.2.6-12b: Acoustical Effectiveness Analysis for Barrier 12 (Locations R-19 and R-19a)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-19 (1 receptor)	-2	-2	-3	-4	-5	-5
Noise reduction (dBA) at R-19a (1 receptor)	-2	-3	-4	-5	-5	-6

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Total benefited receptors	0	0	0	N/A	N/A	N/A
Total allowance	\$0	\$0	\$0	\$0	\$0	\$0

Barrier Analyses: Sub-Area 7, Amador Valley Boulevard to Alcosta Boulevard

Barrier 13/13–Relocated: Northbound I-680. This is the site of an existing 10-foot-high sound wall on top of a retaining wall (RW-599), part of which may be removed and reconstructed by up to 22 feet to the east to accommodate the northbound express lane. The existing sound wall is sufficient to reduce the traffic noise level at locations R-24a and R-24b to well below the NAC. The barrier analysis with the new retaining wall and sound wall built slightly to the east of the existing structure is shown in Table 2.2.6-13a. A wall that is the same height as the existing barrier would be feasible, but the new barrier (Barrier 13–Relocated) would need to be increased in height by 4 feet to provide a 7 dBA noise reduction.

**Table 2.2.6-13a: Acoustical Effectiveness Analysis for Barrier 13–Relocated
(Locations R-24a and R-24b)**

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-24a (20 receptors)	-4	-5	-6	-6	-7	-8
Noise reduction (dBA) at R-24b (22 receptors)	-4	-5	-6	-6	-7	-8
Total benefited receptors	0	N/A	N/A	N/A	42	42
Total allowance	\$0	\$0	\$0	\$0	\$4.49M	\$4.49M

Barriers 14A/14A–Relocated: Southbound I-680. At locations R-25, R-25a, and R-25b, the future noise is expected to approach or exceed the NAC. There is an existing 10-foot-high sound wall on top of a retaining wall (RW-600), part of which may be removed and reconstructed by approximately 8 to 15 feet to the west to accommodate the southbound express lane. For the purposes of this analysis, the section of the existing wall that may be relocated is labeled as Barrier 14A, the new barrier is labeled Barrier 14A–Relocated, and the remaining section is labeled as Barrier 14B.

With the existing 10-foot-high sound wall (Barrier 14A), the noise level at receivers near Ironwood Drive (R-25a) does not approach or exceed the NAC of 67 dBA. The noise level near the Resurrection Lutheran Church receptor (R-27) is projected to be 66 dBA; therefore, further barrier analysis is required. Increasing the wall height to 14 feet in this area would provide the minimum 5 dBA noise reduction, but it would not be reasonable to do so as the 7 dBA acoustic design goal would not be achieved. However, the relocated wall (Barrier 14A–Relocated) with a 14-foot height would provide a 5 dBA noise reduction and meet the 7 dBA acoustic design goal for receivers near Ironwood Drive (R-25a). In other words, the modeling analysis indicates that the existing 10-foot-high barrier is feasible for Ironwood Drive (R-25a) as it reduces the traffic noise by 6 dBA, but the future relocated barrier (Barrier 14A–Relocated) would have to be 14 feet high to achieve the 7 dBA noise reduction. Considering both sets of receptors, Barrier 14A–Relocated at 14 feet height would be feasible and reasonable.

**Table 2.2.6-13b: Acoustical Effectiveness Analysis for Barrier 14A—Relocated
(Locations R-25a and R-27)**

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-25a (38 receptors)	-4	-5	-6	-6	-7	-8
Noise reduction (dBA) at R-27 (1 receptor)	-1	-2	-3	-4	-5	-6
Total benefited receptors	0	N/A	N/A	N/A	39	39
Total allowance	\$0	\$0	\$0	\$0	\$4.17M	\$4.17M

Barrier Analysis: Sub-Area 8, North of Alcosta Boulevard

Barrier 16: Southbound I-680. At location R-29a, the future noise is expected to approach or exceed the NAC. There are no sound walls protecting these homes. Table 2.2.6-14 lists the estimated noise reduction from the modeled Barrier 16 at a location along the edge of the pavement. The barrier would not provide the minimum 5 dBA noise reduction or a 7 dBA reduction at any receptor. Based on this preliminary assessment, the modeled barrier configuration would not be feasible as it would not provide a 5 dBA reduction.

Table 2.2.6-14: Acoustical Effectiveness Analysis for Barrier 16 (Location R-29a)

Barrier Analysis Result by Height	6 feet	8 feet	10 feet	12 feet	14 feet	16 feet
Noise reduction (dBA) at R-29a (8 receptors)	1	1	1	1	0	0
Total benefited receptors	0	0	0	0	0	0
Total allowance	\$0	\$0	\$0	\$0	\$0	\$0

Noise Abatement Evaluation Summary

Table 2.2.6-15 presents a summary of the results of the *Noise Abatement Decision Report* (AECOM 2019c). The table lists the sound walls that were studied to provide noise abatement for receptors, the wall heights analyzed, whether the walls would be acoustically feasible (i.e., provide a minimum 5 dBA noise reduction) and reasonable (i.e., meet the acoustic design goal of providing a minimum 7 dBA noise reduction for at least one receptor). For each sound wall that would meet the TNAP acoustical design goal, the table also identifies the total reasonableness allowance for each sound wall and the estimated construction cost.

Table 2.2.6-15: Barrier Acoustical Effectiveness Analysis Results, Reasonable Allowances, and Construction Costs

Barrier (analysis type)	Approximate Location, Length (feet) ^a	Ht (feet)	Acoustically Feasible?	Number of Benefited Receptors	Design Goal Achieved?	Reasonable Allowance per Receptor	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
1A (new)	8855 Pleasanton Sunol Rd (939)	6	No	0	No	\$0	\$0	\$563,400	No
1A (new)	8855 Pleasanton Sunol Rd (939)	8	No	0	No	\$0	\$0	\$751,200	No
1A (new)	8855 Pleasanton Sunol Rd (939)	10	No	0	No	\$0	\$0	\$939,000	No
1A (new)	8855 Pleasanton Sunol Rd (939)	12	No	0	No	\$0	\$0	\$1,126,800	No
1A (new)	8855 Pleasanton Sunol Rd (939)	14	No	0	No	\$0	\$0	\$1,314,600	No
1A (new)	8855 Pleasanton Sunol Rd (939)	16	No	0	No	\$0	\$0	\$1,502,400	No
1B (new)	Koopman Rd (1,080)	6	No	0	No	\$0	\$0	\$648,000	No
1B (new)	Koopman Rd (1,080)	8	No	0	No	\$0	\$0	\$864,000	No
1B (new)	Koopman Rd (1,080)	10	No	0	No	\$0	\$0	\$1,080,000	No
1B (new)	Koopman Rd (1,080)	12	No	0	No	\$0	\$0	\$1,296,000	No
1B (new)	Koopman Rd (1,080)	14	No	0	No	\$0	\$0	\$1,512,000	No
1B (new)	Koopman Rd (1,080)	16	Yes	N/A	No	\$0	\$0	\$1,728,000	No
2 (new)	7960 Pleasanton Sunol Rd (905)	6	No	0	No	\$0	\$0	\$543,000	No
2 (new)	7960 Pleasanton Sunol Rd (905)	8	No	0	No	\$0	\$0	\$724,000	No
2 (new)	7960 Pleasanton Sunol Rd (905)	10	No	0	No	\$0	\$0	\$905,000	No
2 (new)	7960 Pleasanton Sunol Rd (905)	12	No	0	No	\$0	\$0	\$1,086,000	No
2 (new)	7960 Pleasanton Sunol Rd (905)	14	No	0	No	\$0	\$0	\$1,267,000	No
2 (new)	7960 Pleasanton Sunol Rd (905)	16	No	0	No	\$0	\$0	\$1,448,000	No
3 (new)	Happy Valley Rd (640)	6	No	0	No	\$0	\$0	\$791,680	No

Barrier (analysis type)	Approximate Location, Length (feet) ^a	Ht (feet)	Acoustically Feasible?	Number of Benefited Receptors	Design Goal Achieved?	Reasonable Allowance per Receptor	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
3 (new)	Happy Valley Rd (640)	8	Yes	N/A	No	\$0	\$0	\$922,240	No
3 (new)	Happy Valley Rd (640)	10	Yes	N/A	No	\$0	\$0	\$1,052,800	No
3 (new)	Happy Valley Rd (640)	12	Yes	4	Yes	\$107,000	\$428,000	\$1,183,360	No
3 (new)	Happy Valley Rd (640)	14	Yes	4	Yes	\$107,000	\$428,000	\$1,313,920	No
3 (new)	Happy Valley Rd (640)	16	Yes	4	Yes	\$107,000	\$428,000	\$1,444,480	No
4-Trail-Township (new)	Centennial Trail, Plymouth Ave (1,787)	6	Yes	N/A	No	\$0	\$0	\$1,104,366	No
4-Trail-Township (new)	Centennial Trail, Plymouth Ave (1,787)	8	Yes	N/A	No	\$0	\$0	\$1,415,304	No
4-Trail-Township (new)	Centennial Trail, Plymouth Ave (1,787)	10	Yes	1	Yes	\$107,000	\$107,000	\$1,733,390	No
4-Trail-Township (new)	Centennial Trail, Plymouth Ave (1,787)	12	Yes	1	Yes	\$107,000	\$107,000	\$2,015,736	No
4 Trail-Township (new)	Centennial Trail, Plymouth Ave (1,787)	14	Yes	1	Yes	\$107,000	\$107,000	\$2,326,674	No
4-Trail-Township (new)	Centennial Trail, Plymouth Ave (1,787)	16	Yes	1	Yes	\$107,000	\$107,000	\$2,601,872	No
5-Laguna Creek (new)	Laguna Creek Ln (962)	6	Yes	N/A	No	\$0	\$0	\$1,588,744	No
5-Laguna Creek (new)	Laguna Creek Ln (962)	8	Yes	N/A	No	\$0	\$0	\$1,784,992	No
5-Laguna Creek (new)	Laguna Creek Ln (962)	10	Yes	N/A	No	\$0	\$0	\$1,981,240	No
5-Laguna Creek (new)	Laguna Creek Ln (962)	12	Yes	6	Yes	\$107,000	\$642,000	\$2,177,488	No
5-Laguna Creek (new)	Laguna Creek Ln (962)	14	Yes	6	Yes	\$107,000	\$642,000	\$2,373,736	No
5-Laguna Creek (new)	Laguna Creek Ln (962)	16	Yes	6	Yes	\$107,000	\$642,000	\$2,569,984	No

Barrier (analysis type)	Approximate Location, Length (feet) ^a	Ht (feet)	Acoustically Feasible?	Number of Benefited Receptors	Design Goal Achieved?	Reasonable Allowance per Receptor	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
6-Southbound before Bernal Avenue (replacement)	Trotter Way, Minton Ct (1,624)	6	No	0	No	\$0	\$0	\$993,888	No
6-Southbound before Bernal Avenue (replacement)	Trotter Way, Minton Ct (1,624)	8	No	0	No	\$0	\$0	\$1,273,216	No
6-Southbound before Bernal Avenue (replacement)	Trotter Way, Minton Ct (1,624)	10 ^b	Yes	N/A	No	\$0	\$0	\$1,526,560	No
6-Southbound before Bernal Avenue (replacement)	Trotter Way, Minton Ct (1,624)	12	Yes	N/A	No	\$0	\$0	\$1,792,896	No
6-Southbound before Bernal Avenue (replacement)	Trotter Way, Minton Ct (1,624)	14	Yes	15	Yes	\$107,000	\$1,605,000	\$2,068,976	No
6-Southbound before Bernal Avenue (replacement)	Trotter Way, Minton Ct (1,624)	16	Yes	15	Yes	\$107,000	\$1,605,000	\$2,338,560	No
8-Southbound along Regency Drive (replacement)	Meadowlark Park, 8155 Regency Dr, Regency Dr, Foothill Knolls Dr (2,726)	6	No	0	No	\$0	\$0	\$1,635,600	No
8-Southbound along Regency Drive (replacement)	Meadowlark Park, 8155 Regency Dr, Regency Dr, Foothill Knolls Dr (2,726)	8 ^b	No	0	No	\$0	\$0	\$2,180,800	No
8-Southbound along Regency Drive (replacement)	Meadowlark Park, 8155 Regency Dr, Regency Dr, Foothill Knolls Dr (2,726)	10	No	0	No	\$0	\$0	\$2,726,000	No
8-Southbound along Regency Drive (replacement)	Meadowlark Park, 8155 Regency Dr, Regency Dr, Foothill Knolls Dr (2,726)	12	No	0	No	\$0	\$0	\$3,271,200	No
8-Southbound along Regency Drive (replacement)	Meadowlark Park, 8155 Regency Dr, Regency Dr, Foothill Knolls Dr (2,726)	14	Yes	N/A	No	\$0	\$0	\$3,816,400	No

Barrier (analysis type)	Approximate Location, Length (feet) ^a	Ht (feet)	Acoustically Feasible?	Number of Benefited Receptors	Design Goal Achieved?	Reasonable Allowance per Receptor	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
8-Southbound along Regency Drive (replacement)	Meadowlark Park, 8155 Regency Dr, Regency Dr, Foothill Knolls Dr (2,726)	16	Yes	N/A	No	\$0	\$0	\$4,361,600	No
10-Muirwood/Stonedale (replacement)	Cloewood Ln, Muirwood Park-1, Muirwood Park-2, South Stonedale Dr, Stonedale ^c (5,585)	6	Yes	N/A	No	\$0	\$0	\$3,351,000	No
10-Muirwood/Stonedale (replacement)	Cloewood Ln, Muirwood Park-1, Muirwood Park-2, South Stonedale Dr, Stonedale ^c (5,585)	8	Yes	N/A	No	\$0	\$0	\$4,468,000	No
10-Muirwood/Stonedale (replacement)	Cloewood Ln, Muirwood Park-1, Muirwood Park-2, South Stonedale Dr, Stonedale ^c (5,585)	10 ^b	Yes	N/A ^c	No	\$0	\$0	\$5,585,000	No
10-Muirwood/Stonedale (replacement)	Cloewood Ln, Muirwood Park-1, Muirwood Park-2, South Stonedale Dr, Stonedale ^c (5,585)	12	Yes	N/A ^c	No	\$0	\$0	\$6,702,000	No
10-Muirwood/Stonedale (replacement)	Cloewood Ln, Muirwood Park-1, Muirwood Park-2, South Stonedale Dr, Stonedale ^c (5,585)	14	Yes	34	Yes	\$107,000	\$3,638,000	\$7,819,000	No
10-Muirwood/Stonedale (replacement)	Cloewood Ln, Muirwood Park-1, Muirwood Park-2, South Stonedale Dr, Stonedale ^c (5,585)	16	Yes	55	Yes	\$107,000	\$5,885,000	\$8,936,000	No
7A- Trail (new)	Centennial Trail (6,143)	6	No	0	No	\$0	\$0	\$3,685,800	No
7A- Trail (new)	Centennial Trail (6,143)	8	No	0	No	\$0	\$0	\$4,914,400	No
7A- Trail (new)	Centennial Trail (6,143)	10	No	0	No	\$0	\$0	\$6,143,000	No

Barrier (analysis type)	Approximate Location, Length (feet) ^a	Ht (feet)	Acoustically Feasible?	Number of Benefited Receptors	Design Goal Achieved?	Reasonable Allowance per Receptor	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
7A- Trail (new)	Centennial Trail (6,143)	12	Yes	N/A	No	\$0	\$0	\$7,371,600	No
7A- Trail (new)	Centennial Trail (6,143)	14	Yes	N/A	No	\$0	\$0	\$8,600,200	No
7A- Trail (new)	Centennial Trail (6,143)	16	Yes	9	Yes	\$107,000	\$963,000	\$9,828,800	No
7B-Heath (new)	Heath Ct (2,177)	6	No	0	No	\$0	\$0	\$1,306,200	No
7B-Heath (new)	Heath Ct (2,177)	8	No	0	No	\$0	\$0	\$1,741,600	No
7B-Heath (new)	Heath Ct (2,177)	10	No	0	No	\$0	\$0	\$2,177,000	No
7B-Heath (new)	Heath Ct (2,177)	12	No	0	No	\$0	\$0	\$2,612,400	No
7B-Heath (new)	Heath Ct (2,177)	14	Yes	N/A	No	\$0	\$0	\$3,047,800	No
7B-Heath (new)	Heath Ct (2,177)	16	Yes	N/A	No	\$0	\$0	\$3,483,200	No
11-Stoneridge (replacement)	Stoneridge Mall Rd (662)	6	No	0	No	\$0	\$0	\$405,144	No
11-Stoneridge (replacement)	Stoneridge Mall Rd (662)	8 ^b	Yes	N/A	No	\$0	\$0	\$529,600	No
11-Stoneridge (replacement)	Stoneridge Mall Rd (662)	10	Yes	10	Yes	\$107,000	\$1,070,000	\$648,760	Yes
11-Stoneridge (replacement)	Stoneridge Mall Rd (662)	12	Yes	10	Yes	\$107,000	\$1,070,000	\$770,568	Yes
11-Stoneridge (replacement)	Stoneridge Mall Rd (662)	14	Yes	10	Yes	\$107,000	\$1,070,000	\$861,924	Yes
11-Stoneridge (replacement)	Stoneridge Mall Rd (662)	16	Yes	10	Yes	\$107,000	\$1,070,000	\$974,464	Yes
12-Valley Bible Church (new)	Valley Bible Church, Centennial Trail (569)	6	No	0	No	\$0	\$0	\$341,400	No
12-Valley Bible Church (new)	Valley Bible Church, Centennial Trail (569)	8	No	0	No	\$0	\$0	\$455,200	No
12-Valley Bible Church (new)	Valley Bible Church, Centennial Trail (569)	10	No	0	No	\$0	\$0	\$569,000	No
12-Valley Bible Church (new)	Valley Bible Church, Centennial Trail (569)	12	Yes	N/A	No	\$0	\$0	\$682,800	No
12-Valley Bible Church (new)	Valley Bible Church, Centennial Trail (569)	14	Yes	N/A	No	\$0	\$0	\$796,600	No

Barrier (analysis type)	Approximate Location, Length (feet) ^a	Ht (feet)	Acoustically Feasible?	Number of Benefited Receptors	Design Goal Achieved?	Reasonable Allowance per Receptor	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
12-Valley Bible Church (new)	Valley Bible Church, Centennial Trail (569)	16	Yes	N/A	No	\$0	\$0	\$910,400	No
13-Relocated Canterbury	Canterbury Ln, Bedford Ct (3,194)	6	No	0	No	\$0	\$0	\$1,686,432	No
13-Relocated Canterbury	Canterbury Ln, Bedford Ct (3,194)	8	Yes	N/A	No	\$0	\$0	\$2,197,472	No
13-Relocated Canterbury	Canterbury Ln, Bedford Ct (3,194)	10 ^b	Yes	N/A	No	\$0	\$0	\$2,682,960	No
13-Relocated Canterbury	Canterbury Ln, Bedford Ct (3,194)	12	Yes	N/A	No	\$0	\$0	\$3,142,896	No
13-Relocated Canterbury	Canterbury Ln, Bedford Ct (3,194)	14	Yes	42	Yes	\$107,000	\$4,494,000	\$3,577,280	Yes
13-Relocated Canterbury	Canterbury Ln, Bedford Ct (3,194)	16	Yes	42	Yes	\$107,000	\$4,494,000	\$3,986,112	Yes
14A-Relocated Ironwood	Ironwood Dr, Resurrection Lutheran Church (3,086)	6	No	0	No	\$0	\$0	\$1,496,400	No
14A-Relocated Ironwood	Ironwood Dr, Resurrection Lutheran Church (3,086)	8	Yes	N/A	No	\$0	\$0	\$1,948,800	No
14A-Relocated Ironwood	Ironwood Dr, Resurrection Lutheran Church (3,086)	10 ^b	Yes	N/A	No	\$0	\$0	\$2,378,000	No
14A-Relocated Ironwood	Ironwood Dr, Resurrection Lutheran Church (3,086)	12	Yes	N/A	No	\$0	\$0	\$2,784,000	No
14A-Relocated Ironwood	Ironwood Dr, Resurrection Lutheran Church (3,086)	14	Yes	39	Yes	\$107,000	\$4,173,000	\$3,166,800	Yes

Barrier (analysis type)	Approximate Location, Length (feet) ^a	Ht (feet)	Acoustically Feasible?	Number of Benefited Receptors	Design Goal Achieved?	Reasonable Allowance per Receptor	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
14A-Relocated Ironwood	Ironwood Dr, Resurrection Lutheran Church (3,086)	16	Yes	39	Yes	\$107,000	\$4,173,000	\$3,526,400	Yes
16-Palmer (new)	Palmer St (1,140)	6	No	0	No	\$0	\$0	\$684,000	No
16-Palmer (new)	Palmer St (1,140)	8	No	0	No	\$0	\$0	\$912,000	No
16-Palmer (new)	Palmer St (1,140)	10	No	0	No	\$0	\$0	\$1,140,000	No
16-Palmer (new)	Palmer St (1,140)	12	No	0	No	\$0	\$0	\$1,368,000	No
16-Palmer (new)	Palmer St (1,140)	14	No	0	No	\$0	\$0	\$1,596,000	No
16-Palmer (new)	Palmer St (1,140)	16	No	0	No	\$0	\$0	\$1,824,000	No

Notes:

a. Barrier lengths are based on linear approximations used for purposes of noise modeling in TNM. Actual lengths may differ slightly due to barrier curvature, etc.

b. Current barrier height.

c. For determining total benefited receptors only; location R-14 (Stonedale Dr.) does not approach or exceed the NAC and would therefore not qualify for a noise barrier on its own, thus no cost allowance is shown until impacted receivers are benefited (R-13 and R-13b).

d. Receptor R-14 does not approach or exceed the NAC, and therefore does not qualify for a noise barrier on its own despite reaching the 7 dBA reduction criteria. No total allowance is calculated until a receptor that approaches/exceeds the NAC is benefited, which occurs at 14 feet.

Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of barriers at the following locations:

- Barrier 11, approximately 662 feet long and 10 feet high. Calculations based on preliminary design data show that the barrier will reduce noise levels by 5 to 7 dBA for 10 residences at a cost of \$648,760.
- Barrier 13–Relocated, approximately 3,194 feet long and 14 feet high. Calculations based on preliminary design data show that the barrier will reduce noise levels by 5 to 8 dBA for 42 residences at a cost of \$3,577,280.
- Barrier 14A–Relocated, approximately 2,900 feet long and 14 feet high. Calculations based on preliminary design data show that the barrier will reduce noise levels by 6 to 8 dBA for 38 residences and a church at a cost of \$3,166,800.

If the project is constructed in phases (described in Section 1.4.1), Barriers 11 and 14A–Relocated would be constructed in Phase 1 as part of work on southbound I-680, and Barrier 13–Relocated would be constructed in Phase 2 as part of work on northbound I-680.

These measures may change based on input received from the public. If conditions have substantially changed during final design, noise abatement may not be constructed. The final decision on noise abatement will be made upon completion of the project design. As noted in Section 2.2.6.1, the viewpoints of benefited receptors and factors such as design, constructability, and cost—which are based on estimates that would be refined during project design—would be considered as part of the decision.

Short-Term (Construction) Noise

NOI-1. Standard Caltrans measures that are used for all projects include that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9:00 PM and 6:00 AM. The following standard measures will also be implemented to minimize or reduce the potential for noise impacts from project construction:

- Limit pile driving activities to between 7:00 AM and 7:00 PM, where feasible.
- Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling (i.e., greater than 5 minutes in duration) 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 as practical from noise-sensitive receptors.
- Utilize “quiet” air compressors and other “quiet” equipment where such technology exists.

2.2.7 Energy

2.2.7.1 Regulatory Setting

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

The California Environmental Quality Act (CEQA) Guidelines section 15126.2(b) and CEQA Appendix F, Energy Conservation, require an analysis of a project's energy use to determine if the project may result in significant environmental effects due to wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources.

2.2.7.2 Affected Environment

This section describes existing conditions in the project area and State that affect energy usage.

Project Area

Most of southbound I-680 in the project area operates at LOS E or F during the AM peak period, and northbound I-680 operates at LOS E or F between approximately I-580 and Stoneridge Drive during the AM peak period (Section 2.1.7.1). TSM strategies such as ramp metering, traffic operation systems, and auxiliary lanes are already in use within the project limits. Highway lighting is present in approximately 33 locations along the edge of southbound I-680 and 47 locations along the edge of northbound I-680.

Based on Caltrans' pavement condition surveys, various portions of the I-680 freeway pavement from Koopman Road to Alcosta Boulevard are in an advanced phase of cracking and faulting. Cracking and faulting can lead to the formation of potholes and/or pavement failure. Separate from this project, the I-680 Pavement Rehabilitation Project (04-ALA-680 PM M12.4/R21.9; EA 04-0J620) will resurface and restore the mainline and ramp pavement between Koopman Road to Alcosta Boulevard, including replacing approach slabs.

California

In California, the transportation sector consumes the most energy (nearly 40 percent in 2017; U.S. Energy Information Administration 2019a). The high consumption of transportation fuels in California is attributed to the state's abundance in airports, military bases, public transportation, and automobiles. In addition, major metropolitan areas, such as San Francisco and Los Angeles, experience extremely long commute travel times and delay because of high traffic congestion and long distances of travel between homes and jobs.

Fossil fuels are the predominant source of energy consumed by the transportation sector. Approximately 56 percent of the fossil fuel consumed by the California transportation sector is gasoline (U.S. Energy Information Administration 2019b). Alternatives to fossil fuels have helped decrease the dependence on gasoline and other fossil fuels. The following alternatives to fossil fuels are currently used in California (U.S. Energy Information Administration 2019c):

- Compressed natural gas
- Electricity

- Ethanol, 85 percent
- Hydrogen
- Liquefied natural gas
- Liquefied petroleum gas

2.2.7.3 Environmental Consequences

Energy use under the No Build and Build alternatives was evaluated to determine if the proposed project would result in a net increase in energy use and/or decrease in energy efficiency. The Caltrans Standard Environmental Reference, Volume 1, Chapter 13, Energy (Caltrans 2015) was used as guidance to analyze the direct and indirect energy consumption attributed to the proposed project. Direct energy refers to the fuel consumed by vehicles that would use the proposed project facility. Indirect energy refers to all the remaining energy consumed to run a transportation system, including construction, maintenance, and operation energy (e.g., lighting).

Direct and Indirect Energy Use

Methodology

The analysis examined the proposed project's impacts on regional transportation energy use. The project's influence area includes the Tri-Valley area, ranging from Alamo in the north, the I-580 Altamont Pass area in the east, the Sunol Grade in the south, and the I-580 Dublin Grade area in the west. The region examined in this analysis is the same as the influence area established in the *Traffic Operations Analysis Report* (Fehr and Peers 2019), which encompasses the Tri-Valley area, ranging from Alamo in the north, the I-580/Altamont Pass area in the east, the Sunol Grade in the south, and the I-580/Dublin Grade area in the west. This influence area includes the communities of Pleasanton, Dublin, Livermore, San Ramon, Danville, Alamo and Sunol, in addition to other unincorporated areas of southern Contra Costa County and eastern Alameda County.

Direct Energy Use

The direct energy use (i.e., vehicle fuel consumption) for the No Build and Build alternatives was estimated based on the reported vehicle miles traveled (VMT) for automobiles and trucks for the project region (Fehr and Peers 2019). The project is intended to increase the efficiency of the transportation system by increasing the capacity on I-680 from SR 84 to Alcosta Boulevard. Due to the increased capacity of I-680, the Build Alternative would slightly increase the daily VMT in the project region (less than 0.5 percent) compared to the No Build Alternative in both the opening year (2025) and design year (2045), as shown in Table 2.2.7-1.

Table 2.2.7-1: Daily VMT (Thousand Miles) for the Project Region

Vehicle category	2018 Existing	2025 No Build	2025 Build	2025 Net change	2045 No Build	2045 Build	2045 Net change
Light-Duty Vehicles	9,639	10,469	10,484	16	12,840	12,901	60
Trucks ¹	725	788	789	1	966	971	5
Total	10,364	11,257	11,274	17	13,807	13,872	65

Note: Daily VMT and the associated net changes are rounded up to the nearest whole integers.

Source: Total daily VMT values for the project region are obtained from Fehr and Peers 2019. Portion of total daily VMT associated with each vehicle category for Alameda County was derived from the California Air Resources Board's (CARB's) EMFAC2017 model.

1. Truck refers to medium-duty and heavy-duty trucks. Buses only contribute to approximately 0.3% of the total VMT and hence are not listed as a separate category. The daily VMT associated with buses is included in the daily VMT for trucks.

Fuel consumption information for Alameda County was derived from the California Air Resources Board's (CARB's) EMFAC2017 model (CARB 2019a).¹² Based on the distribution of vehicle types reported in Alameda County, the weighted averages of gasoline and diesel consumption for automobiles and trucks were estimated for the years 2018, 2025, and 2045. As shown in Table 2.2.7-2, fuel consumption rates for gasoline and diesel are expected to decrease over time. Average fuel consumption for electric vehicles (EV) for year 2018 was estimated based on the Fuel Economy Guide for the 2018 vehicle model year (Department of Energy 2019). It was conservatively assumed that EV fuel consumption for the years 2025 and 2045 would be the same as the year 2018.

Table 2.2.7-2: Average Fuel Consumption Rates (Gallons/Mile)

Vehicle category	Fuel type	2018 Existing	2025 No Build	2025 Build	2045 No Build	2045 Build
Light-Duty Vehicles	Gasoline	0.041	0.034	0.034	0.026	0.026
Light-Duty Vehicles	Diesel	0.046	0.04	0.04	0.034	0.034
Light-Duty Vehicles	Electricity ¹	0.01	0.01	0.01	0.01	0.01
Trucks	Gasoline	0.217	0.197	0.197	0.164	0.164
Trucks	Diesel	0.147	0.126	0.126	0.098	0.098

1. Fuel consumption for electric vehicles, kWh, is converted into miles per gallon of gasoline equivalent (MPGe) using a conversion factor of 100 kWh of electricity per 3.1 gasoline gallon equivalents (California Energy Commission 2019a).

The total daily gasoline, diesel, and electricity consumptions for the project region were estimated based on the reported daily VMT and average fuel consumption rates (Table 2.2.7-3), which was then used to estimate the annual direct energy consumption in British thermal units (BTUs) for the Build and No Build alternatives (Table 2.2.7-4).

¹² This analysis does not currently account for the effects of the US National Highway Traffic Safety Administration and Environmental Protection Agency SAFE (Safer Affordable Fuel-Efficient) Vehicles Rule. Part One revoking California's authority to set its own greenhouse gas emissions standards was published on September 27, 2019 and effective November 26, 2019. The SAFE Vehicles Rule Part 2 would amend existing Corporate Average Fuel Economy (CAFE) and tailpipe carbon dioxide emissions standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026. The proposal would retain the model year 2020 standards for both programs through model year 2026. No adjustment factors have been developed for fuel consumption rates. Modeling these estimates with EMFAC or CT-EMFAC remains the most precise means of estimating fuel consumption rates.

Table 2.2.7-3: Total Daily Fuel Consumption (Gallons)

Vehicle category	Fuel type	2018 Existing	2025 No Build	2025 Build	2025 Net change	2045 No Build	2045 Build	2045 Net change
Light-Duty Vehicles	Gasoline	383,559	332,881	333,379	498	308,273	309,724	1,451
Light-Duty Vehicles	Diesel	9,090	10,700	10,716	16	12,425	12,483	58
Light-Duty Vehicles	Electricity ¹	1,231	3,013	3,018	5	6,404	6,434	30
Trucks	Gasoline	5,003	4,446	4,452	7	4,082	4,102	19
Trucks	Diesel	102,446	95,524	95,667	143	91,548	91,979	431

Note: Fuel consumption and the associated net changes are rounded up to the nearest integers.

1. Fuel consumption for electric vehicles, kWh, is converted into miles per gallon of gasoline equivalent (MPGe) using a conversion factor of 100 kWh of electricity per 3.1 gasoline gallon equivalents (California Energy Commission 2019a).

Table 2.2.7-4: Total Annual Direct Energy Consumption for the Project Region (Billion BTU)

2018 Existing	2025 No Build	2025 Build	2025 Net Change	2045 No Build	2045 Build	2045 Net Change
17,918	15,994	16,018	24	15,158	15,229	71

Note: Assumed an energy content of 111,800 BTUs per gallon of gasoline and 127,500 BTUs per gallon of diesel (California Energy Commission 2019a). Energy consumption and the associated net changes are rounded up to the nearest integers.

The direct energy consumption in 2025 and 2045 is expected to improve relative to existing conditions for both the No Build and Build alternatives in the project region due to expected improvements in vehicle fuel economy. In the project region, the Build Alternative would increase the direct energy consumption by 0.15 percent in 2025 and 0.46 percent in 2045 compared to the No Build Alternative due to the increased vehicle capacity on I-680. However, the proposed project would support a shift to high-occupancy modes of travel (i.e., carpools, vanpools, and public transit), which would reduce the overall fuel consumption per vehicle occupant. This potential influence on fuel consumption was not included in the EMFAC2017 calculation. Therefore, the direct energy consumption calculated for the Build Alternative in Table 2.2.7-4 is considered conservative, and the estimated slight increase in direct energy consumption with the Build Alternative compared to the No Build Alternative would not have a substantial, cumulative regional impact.

Indirect Energy Use

Indirect energy consumption for the No Build and Build alternatives was estimated based on the annual energy-use factors derived from the Caltrans *Energy and Transportation Systems Handbook* (Caltrans 1983). Because a mix of vehicle types would use the project roadways, the manufacturing and maintenance energy-use factors were calculated based on the fleet-wide distribution of light-duty, medium-duty, and heavy-duty vehicles in Alameda County reported from CARB's EMFAC2017 model.

Indirect energy uses for the Build Alternative would include construction and maintenance of the proposed project, as well as manufacturing and maintenance of the vehicles that traverse the project region. The annual indirect energy uses were calculated for the project region, as summarized in Table 2.2.7-5. The Build Alternative would increase annual indirect energy consumption compared to the No Build Alternative by 0.3 percent in 2025 and by 0.5 percent in

2045. The increases would primarily result from the facility construction and increased manufacturing and maintenance of vehicles using the facility.

Table 2.2.7-5: Annual Indirect Energy Consumption (Billion BTU) for the Project Region

Energy Use Type	2018 Existing	2025 No Build	2025 Build	2025 Net Change	2045 No Build	2045 Build	2045 Net Change
Facility Construction	NA	NA	37	37	NA	37	37
Facility Maintenance	4,682	5,085	5,093	8	6,237	6,266	29
Vehicle Manufacturing	9,035	9,035	9,039	3	9,035	9,039	3
Vehicle Maintenance	4,529	4,919	4,927	7	6,034	6,062	28
Total Indirect Energy	18,246	19,040	19,095	55	21,306	21,404	98

NA = not applicable

Note: Energy consumption and the associated net changes are rounded up to the nearest integers.

Summary

The proposed project would close the 9-mile gap between existing and in-progress HOV/express lane projects directly to the north and south and contribute to the completion of the regional network of HOV/express lanes envisioned in *Plan Bay Area* (Section 1.3.2.2). By helping to provide a continuous HOV/express lane system, the proposed project, combined with other in-progress and proposed HOV/express lane projects, would provide reliable travel times for carpools, vanpools, and public transit in the corridor and support a shift to those modes.

Modeling shows the Build Alternative would slightly increase direct and indirect energy consumption in 2025 and 2045 compared to the No Build Alternative. The results do not account for potential reductions in fuel consumption associated with high-occupancy travel modes, or the fact that EV fuel consumption was conservatively assumed to be the same for the years 2025 and 2045 as the year 2018.

The analysis of direct and indirect energy use also does not account for other project components that would reduce energy use. The Build Alternative would include additional TMS measures in the form of vehicle detection systems to monitor traffic speed and density, as well as enforcement, incident management, and other subsystems to maintain acceptable traffic flow in the HOV/express lanes. Energy-efficient lighting will be used for VTMS signs and other highway lighting. Existing asphalt concrete pavement that is removed will be recycled if economically and logistically advantageous. Additional features, such as barricades, signs, crash cushions, signals, guardrails, and lighting, will be salvaged and reused if they are in working condition and if doing so proves economically and logistically advantageous. These features will be further analyzed during the final design phase.

As such, the project would not result in an inefficient, wasteful, and unnecessary consumption of energy.

Consistency with Energy Conservation Plans

The *California Energy Action Plan* was approved in 2003 by the Energy Resources Conservation Development Commission (also known as the California Energy Commission [CEC]), the California Public Utilities Commission (CPUC), and the Consumer Power and Conservation Financing Authority (which is now defunct). The goal of the Plan was to ensure that adequate,

reliable, and reasonably-priced electrical power and natural gas supplies are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound. A second Energy Action Plan was adopted in 2005, and an update was issued in 2008. In 2019, the California Energy Commission issued the *California Energy Efficiency Action Plan*, which focuses on reducing energy use in sectors other than transportation; separately, the CPUC has been consolidating efforts to implement directives from the Legislature and the Governor's Office to accelerate investment in transportation electrification (California Energy Commission 2019c).

The CEC also prepares a biennial integrated energy policy report that assesses major energy trends and issues and provides policy recommendations to conserve resources, and issues updates and associated policy recommendations in alternate years. The 2019 *Integrated Energy Policy Report* assesses the state of “clean transportation” in California, including the target of deploying 5 million zero-emission vehicles (ZEVs), including transit and school buses and freight vehicles, statewide by 2030 in accordance with Executive Order B-48-18 (CEC 2019b).

The proposed project is included in the current Regional Transportation Plan (RTP) for the San Francisco Bay Area (MTC and ABAG 2017, amended 2020; reference number 17-10-0065). The RTP integrates a Sustainable Communities Strategy on land use, housing, and transportation to meet targets in energy efficiency and reduction in fossil fuel consumption, as required by SB 375 (CARB 2014). In addition, the RTP provides for funding carpooling incentives, including private sector ride-matching applications, that target use HOV/express lane use.

As discussed above, conservative estimates of energy consumption indicated that the Build Alternative would slightly increase consumption relative to the No Build Alternative (less than 0.5 percent); however, the Build Alternative would support RTP initiatives to increase carpools, vanpools, and public transit that would use HOV/express lanes, including zero-emission vehicle ridesharing and transit vehicles. High-occupancy travel modes would reduce overall fuel consumption per occupant. Therefore, the operation of the proposed project would not conflict with a state or local plan for renewable energy or energy efficiency.

Energy use during the construction of the proposed project would be temporary and a necessary commitment or expenditure that is associated with any infrastructure improvement project. The construction contractor would have a financial disincentive to waste fuel used by the construction equipment (i.e., excess fuel usage reduces profits). Therefore, it is generally assumed that fuel used during construction would be conserved to the maximum extent feasible. Furthermore, regulations enforced by CARB (Title 13, Section 2485 of California Code of Regulations) limit the idling time of diesel construction equipment to five minutes. Therefore, it is anticipated that energy consumption during the construction period would be minimized to the maximum extent practicable. Therefore, the construction of the proposed project would not conflict with a state or local plan for renewable energy or energy efficiency.

2.2.7.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation is required.

2.3 Biological Environment

2.3.1 Natural Communities

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors, fish passage, and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act (FESA) are discussed below in Section 2.3.5. Wetlands and other waters are discussed below in Section 2.3.2.

2.3.1.1 Affected Environment

This section is summarized from the *Natural Environment Study* (AECOM 2019d) for the proposed project, which was completed in August 2019.

A biological study area (BSA) was established to evaluate the effects of the proposed project on natural communities and other biological resources. The BSA is composed of the project footprint—the maximum extent of temporary and permanent impacts—and an additional, typically 50-foot buffer. The design of the proposed project has been refined through coordination among Caltrans, project biologists, and engineers to reduce impacts. The BSA also includes areas that could potentially be used for restoration, tree planting, mitigation, and staging. The BSA is approximately 554 acres and includes I-680 from PM R10.6 to R21.4 in Alameda County and R0.0 to R1.1 in Contra Costa County.

The majority of the BSA consists of developed land (approximately 315 acres), including the paved surfaces of I-680, SR 84, paved or gravel driveways, structures, and residential and commercial properties. The next largest portion (approximately 236 acres) consists of natural vegetation communities (including grasslands, woodlands, scrublands, wetlands, ruderal, and landscaped vegetation). Riverine features (including perennial, intermittent, and ephemeral channels) comprise approximately 3 acres. Detailed mapping of vegetation communities in the BSA is included in the *Natural Environment Study* (AECOM 2019d).

Habitat conservation plans in the project vicinity are discussed in Section 2.1.2.1.

Vegetation Communities

Sensitive vegetation communities are defined as those that are considered vulnerable, imperiled, or critically imperiled, in California. These categories contain native plant communities that are regarded by CDFW as having special significance under CEQA. The following describes the vegetation communities in the BSA, along with each community's suitability as wildlife habitat.

Grassland

California Annual Grassland

California annual grassland is defined as being dominated by one or more annual grasses and having no or very little shrub or tree layer. This is among the most abundant community types

within the state of California and within the BSA. California annual grassland is a combination of a variety of vegetation alliances, including semi-natural herbaceous stands such as wild oats grassland, annual brome grasslands, and perennial rye grass fields. Poison hemlock (*Conium maculatum*) or sweet fennel patches (*Foeniculum vulgare*) and upland mustards (black mustard [*Brassica nigra*], and field mustard [*Brassica rapa*]) are common invasive species and occur in patches in disturbed areas and on hillsides, within the grassland community. This community is dominated by introduced grasses and forbs such as wild oats (*Avena* sp.), soft chess (*Bromus hordeaceus*), burclover (*Medicago* sp.), and Italian ryegrass (*Festuca perennis*). Although grasslands in the BSA are dominated by nonnative species, some native wildflowers grow scattered among the annual grasses including California poppy (*Eschscholzia californica*), horseweed (*Erigeron canadensis*), and yarrow (*Achillea millefolium*).

Grasslands, when located sufficiently close to amphibian breeding populations, can be used for upland foraging and aestivation¹³ habitat for California red-legged frog (federal threatened, state species of special concern) and California tiger salamander (federally threatened, state threatened). Small mammal burrows are an important resource in grasslands because they may provide aestivation locations for amphibians and reptiles.

Forests and Woodlands

Coast Live Oak Woodland

Coast live oak woodland occurs in patches throughout the BSA, often found in the depressions between hills. The soils are deep, sandy and loamy with high organic matter (Sawyer et al. 2009). Coast live oak (*Quercus agrifolia*) is the dominant overstory tree species in this community. Occasionally, valley oak (*Quercus lobata*), California bay tree (*Umbellularia californica*), and California buckeye (*Aesculus californica*) are found as co-dominant species in the canopy. Because of competition for access to light, and the density and age of the community, the trees in some areas are large and tall and the canopies are generally continuous. The shrub layer is sparse to intermittent. Understory herbaceous species are those common to California annual grasslands.

Valley Oak Woodland

Valley oak woodland occurs in several places in the BSA, typically at higher elevations than coast live oak woodland, on high riparian terraces and mesic meadows with little other tree competition. This vegetation community is dominated by valley oak, with no shrubby understory and with primarily nonnative annual grasses in the herbaceous understory. The trees are mostly large mature oaks often 50 feet tall or larger. Young trees and saplings are missing, very likely because of grazing and drought. The canopy is typically open; however, it is continuous in some cases. The community occurs on seasonally saturated alluvial soils. Because of its limited current distribution due to clearing for pasture and agricultural land, valley oak woodland is considered a sensitive vegetation community by CDFW.

¹³ Aestivation is a state of dormancy, similar to hibernation, that animals enter in response to high temperatures and arid conditions.

Mixed Oak Woodland

Mixed oak woodland is present throughout the BSA, in forest stands where several oak species are dominant in the canopy, including valley oak, coast live oak, and canyon live oak (*Quercus chrysolepis*). California sycamore (*Platanus racemosa*) is often interspersed in mixed oak woodlands. Common species in the subcanopy include black walnut (or ‘Paradox’ hybrid walnut) (*Juglans hindsii* x *Juglans regia*) and California buckeye. This is the most dominant woodland community within the BSA.

Hinds’s Walnut and Related Stands

Hinds’s walnut and related stands are primarily dominated by Northern California black walnut, or Hinds’s walnut (*Juglans hindsii*). Hinds’s walnut readily hybridizes with other walnut species—English walnut (*J. regia*) and three other North American black walnut species: Eastern black walnut (*J. nigra*), Arizona walnut (*J. major*), and Southern California black walnut (*J. californica*)—making positive identification difficult without genetic testing and dendrochronological analysis (Sawyer et al. 2009).

In the BSA, black walnut (*Juglans* spp.) occurs within the subcanopy of several woodland types where they share the tree canopy with Fremont cottonwood (*Populus fremontii*) and valley oak. In a few stands, walnut is the dominant species; some of these woodlands may be remnant orchards. Walnut groves provide suitable habitat for foraging birds such as the northern mockingbird (*Mimus polyglottos*), and the dark-eyed junco (*Junco hyemalis*).

Old-growth stands of Hinds’s walnut are a sensitive vegetation community. The closest California Natural Diversity Data Base (CNDDB) occurrence is in the vicinity of Lafayette in Contra Costa County, over 25 miles north of the BSA. The historic native range of the Hinds’s walnut is considered south Inner North Coast Ranges, south Sacramento Valley, north San Joaquin Valley, and San Francisco Bay Area (Baldwin et al. 2012). Today, both natural and semi-natural stands occur in California; however, only one confirmed, native occurrence appears extant. Genetic testing and dendrochronological analysis conducted by SFPUC personnel in black walnut groves in Sunol, determined that the groves were not composed of the protected Hinds’s walnut species (Bartosh 2016). Based on these results, and the abundance of naturalized hybrid black walnut populations growing within the floodplains of many Northern California rivers and streams, it is likely that the walnut trees within the BSA also are of hybrid origin.

Eucalyptus Groves

Various stands of eucalyptus (*Eucalyptus* spp.) are along the sides of I-680 within the study area. Eucalyptus groves consist of areas dominated by one or more nonnative species of eucalyptus. In the BSA, blue gum (*Eucalyptus globulus*) and red ironbark (*Eucalyptus sideroxylon*) often occur in groves as planted windrows along the freeway. The ground layer in this community is often very sparse or devoid of understory vegetation due to the presence of thick duff and the alleopathic nature of eucalyptus trees. Occasional understory species include nonnative grasses and herbs such as clover (*Trifolium* sp.) and Italian ryegrass.

Riparian Scrub and Forest

Riparian forest and scrub corridor lines Vallecitos Creek in the BSA. The riparian forest and scrub habitat is a multi-alliance assemblage of wetland and riparian trees and shrubs that

narrowly line both banks adjacent to the active channels, and in some locations, a flood terrace below the ordinary high water mark (OHWM). Riparian forest and scrub habitat consists of dense stands of mature trees and associated understory vegetation that is well developed and often impenetrable (Holland 1986). A midstory canopy layer is present in riparian communities, composed of medium sized trees and tall shrubs. Because of the multiple canopies and diversity of species, it is challenging to identify dominant species to determine clear boundaries of different vegetation alliances.

Dominant species in the overstory include red willows (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), Fremont cottonwood, valley oak, coast live oak, and walnut. Dominant species in the shrubby and herbaceous layer include poison oak (*Toxicodendron diversilobum*), Himalayan blackberry (*Rubus armeniacus*), and mugwort (*Artemisia douglasiana*). The riparian habitat that lines Vallecitos Creek banks are annually exposed to a large variation of flows and water depths as can be observed from the water-deposited debris high up in the canopies of the riparian trees. Creek flow, groundwater, and precipitation are the sources of water for the riparian woodlands in the BSA. Many portions of the riparian habitat contain a dominance of hydrophytic plant species, but may not meet the USACE hydrology or soils criteria to be determined wetlands.

All native riparian vegetation communities are considered sensitive by CDFW due to their limited distribution in California. Riparian scrub and forest is considered high quality habitat, important to wildlife, of relatively limited (and declining) distribution at the local and statewide level, and warranting preservation and management.

Scrubland

Coyote Brush Scrub

Coyote brush scrub occurs in openings and at the edges of coast live oak woodland and riparian scrub and forest in patches throughout the BSA. This community varies from a dense thicket of coyote brush (*Baccharis pilularis*) and poison oak (*Toxicodendron diversilobum*) to more open scrubland intermixed with patches of grassland. Blackberry (*Rubus* sp.) is a common species found mixed within this community. Toyon (*Heteromeles arbutifolia*) occasionally occurs scattered among the coyote brush in openings within the coast live oak woodland. The semi-natural herbaceous stands recognized by Sawyer et al. (2009) found in this grassland group within the study area include Himalayan blackberry semi-natural shrublands and poison oak scrub.

Wetlands

Hardstem Bulrush Marsh

Hardstem bulrush marsh community is present along in patches along some streams adjacent to and under I-680 within the BSA, particularly in Vallecitos Creek. Hardstem bulrush (*Schoenoplectus acutus*) is dominant or co-dominant in the herbaceous layer, along with cattail species (*Typha* sp.). Emergent trees and shrubs may be present at low cover, including blackberry, various willow species, and the occasional cottonwood. Hardstem bulrush marshes are a sensitive vegetation community. The seeds of bulrush, being less hairy and larger than cattail, are one of the most important and commonly used foods of a variety of bird species, and the stems provide nesting habitat for red-winged blackbirds (*Agelaius phoeniceus*) and marsh wrens (*Cistothorus palustris*).

Cattail Marshes

Within the BSA, cattail marshes are a common freshwater marsh community that occurs in locations with slow-moving and shallow water or perennially saturated soils, and may merge into willow scrub and bulrush seeps. Freshwater marshes are typically dominated by perennial emergent monocots and other plants that tolerate inundation or prolonged wet conditions. Dominant species include narrow-leaf cattail (*Typha angustifolia*), and broadleaf cattail (*T. latifolia*), giant horsetail (*Equisetum telmateia*), watercress (*Nasturtium officinale*), tule (*Schoenoplectus* sp.), and mule fat (*Baccharis salicifolia*). These areas provide important foraging and nesting habitat for a variety of bird species. These marshes are along the drainage ditches and streams that flow adjacent to and underneath I-680 in the BSA. Cattail marshes are a sensitive vegetation community.

Disturbed Vegetation

Ruderal Grassland

Ruderal refers to mainly herbaceous habitats that are invading highly disturbed areas and contain a mix of weedy volunteer species growing in urban or disturbed settings. Ruderal habitats have low native species diversity. Vegetation in ruderal areas is largely composed of disturbance-tolerant native species and invasive weed species. Within the study area, ruderal habitat is roughly 75 percent vegetated, and appears to be dominated by pineapple weed (*Matricaria discoidea*), mustards, ripgut brome, red stemmed filaree (*Erodium cicutarium*), radish, dissected geranium (*Geranium dissectum*), and fennel. Ruderal habitats within the BSA are confined to the medians and some highway shoulders along I-680 and SR 84, and overgrown access roads.

Landscaped

Landscaped areas comprise all types of development for residential, commercial, industrial, transportation, landfill, landscaping, and recreational uses (e.g., sites with horticultural plantings, golf courses, and irrigated lawns). These areas have been impacted by grading, mowing, filling, and residential use. A wide variety of ornamental trees and shrubs are planted and maintained as landscaping by Caltrans within their ROW. Ornamental landscaping is dominated by a diverse array of ornamental trees and shrubs, primarily within the residential areas in landscaped yards and sidewalks. Common species include Chinese elm (*Ulmus parvifolia*), Peruvian pepper tree (*Schinus molle*), California sycamore, coast live oak, coyote brush, eucalyptus, black cottonwood (*Populus nigra*), Monterey pine (*Pinus radiata*), cherry (*Prunus* sp.), crepe-myrtle (*Lagerstroemia* sp.), and pear (*Pyrus* sp.). Many of the landscape trees have become invasive and spread throughout the ROW. The most widespread species in the ROW include cherry, acacia (*Acacia* sp.), and Callery pear (*Pyrus calleryana*). The most aggressive and pervasive are carob (*Ceratonia siliqua*) and glossy privet (*Ligustrum lucidum*), which line I-680 in dense, often impenetrable thickets, outcompeting native species.

Trees

A total of 1,955 trees were recorded within the survey area, of which 931 are considered native to California and 1,024 are nonnative. The project area is dominated by coast live oak, along with other native oaks including valley oak, canyon live oak, and black walnut. Landscape nonnatives were dominated by Callery pear, acacia, Chinese elm, cherry, various eucalyptus species, European olive (*Olea europea*), and carob (*Ceratonia siliqua*). Many of the trees

observed in the project area are considered invasive plants by the California Invasive Plant Council.

Migratory Corridors and Habitat Fragmentation

The aquatic, upland, wetland, and riparian areas of the BSA may provide habitat for mammals, birds, small reptiles, amphibians and invertebrates. Wildlife along I-680 are largely composed of species that are adapted to and/or tolerant of urban landscapes and disturbances, such as raccoon (*Procyon lotor*), wild turkey, mule deer (*Odocoileus hemionus*), ground squirrel (*Spermophilus beecheyi*), California scrub jay (*Aphelocoma californica*), song sparrow (*Melospiza melodia*), and a variety of other bird species. Near the SR 84/I-680 interchange, where there is connectivity to preserved land (such as Sheep Camp Creek and the Sunol Regional Wilderness), more elusive species, those more sensitive to sound, or those with specific habitat requirements may be present, including coyote, gray fox (*Urocyon cinereoargenteus*), common garter snake (*Thamnophis sirtalis*), great blue heron, marsh wren, Pacific tree frog (*Pseudacris regilla*), western pond turtle, California vole (*Microtus californicus*), pocket gopher, burrowing owl, and raptors. Wildlife may use the creek, drainages, and riparian areas as migration corridors to other specific aquatic or terrestrial habitats. Culverts that collect water from the east side of I-680 to the west side of the interstate, may also provide migratory corridors for wildlife.

I-680 runs along the Southern Pacific railroad tracks, crossings of which are enabled by bridges and/or culverts. I-680 is expected to limit the area's function as an east-west migration corridor due to habitat fragmentation, the high level of human activity, vehicle traffic, and associated light and noise pollution, as well as natural impediments such as steep or sheer embankments and rapid stream flows. Along the I-680 corridor, in particular, large culverts and undercrossings serve as important connectors for wildlife. I-680 is considered a 'hot spot' for collisions involving vehicles and wildlife. Mule deer, wild turkey, and grey fox are the most common species identified in wildlife cameras set up at box culverts under I-680 near Sunol (UC Davis Road Ecology Center 2016b).

Current barriers in the BSA include buildings, fencing, road berms, steep road shoulders, concrete medians, and metal guardrails that can impede migration. Roads with high levels of traffic are a source of mortality. Some special-status species that may use the BSA for migration are not expected to breed in or inhabit the BSA in large numbers; these include the Alameda whipsnake, sharp-shinned hawk, grasshopper sparrow, ferruginous hawk, northern harrier, California yellow warbler, white-tailed kite, American peregrine falcon, and golden eagle.

Fish Passage

No creeks or drainages within the BSA support federally or state-listed anadromous fisheries because of downstream impediments. Resident rainbow trout (*Oncorhynchus mykiss*) populations may be present in the watershed but were not observed during the field surveys. Fish were observed outside of the BSA in Vallecitos Creek on the west side of I-680. The BSA does not include any streams where anadromous fish may occur, and no species subject to any fisheries management plans are known to be present in Vallecitos Creek. In addition, no National Marine Fisheries Service (NMFS) essential fish habitat is present within the BSA (NMFS 2020) (Appendix C).

2.3.1.2 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect vegetation, migratory corridors, or fish passage.

Build Alternative

Vegetation Communities

Table 2.3.1-1 lists the anticipated permanent and temporary impacts to vegetation communities in the BSA. Impact acreages are provided by phase and for the full Build Alternative.

Table 2.3.1-1: Vegetation Communities and Acreages in the BSA and Impacts

Vegetation/Aquatic Community Type ¹	Permanent Impacts Phase 1	Permanent Impacts Phase 2	Permanent Impacts Full Build	Temporary Impacts Phase 1	Temporary Impacts Phase 2	Temporary Impacts Full Build	Total Impacts Full Build
Grasslands							
California annual grassland	0.08	0.04	0.13	7.33	1.23	8.55	8.68
Forest and Woodland							
Coast live oak woodland	<0.01	0.03	0.04	0.50	0.55	1.05	1.08
Eucalyptus groves	<0.01	--	<0.01	0.01	--	0.01	0.01
Hinds's walnut and related stands	<0.01	--	<0.01	0.49	--	0.49	0.49
Mixed oak woodland	0.05	0.35	0.41	2.89	0.85	3.74	4.15
Riparian scrub and forest	--	--	--	--	--	--	--
Valley oak woodland	--	<0.01	<0.01	0.03	0.06	0.09	0.09
Scrubland							
Coyote brush scrub	0.34	0.05	0.38	0.08	0.38	0.46	0.84
Wetlands							
Cattail marsh	--	--	--	--	--	--	--
Hardstem bulrush marsh	--	--	--	--	--	--	--
Riverine							
Riverine Intermittent and ephemeral channels	--	--	--	<0.01	--	<0.01	<0.01
Disturbed Vegetation							
Landscaped	1.98	4.05	6.03	14.83	8.25	23.07	29.10
Ruderal grassland	6.22	0.79	7.01	4.73	5.32	10.05	17.06
Total²	8.67	5.32	13.99	30.89	16.63	47.52	61.51

Notes:

1. Vegetation communities mapped based on their dominant species. Boundaries of forest and woodland and scrubland communities were mapped to the edge of the dripline. Developed areas (defined as the paved surfaces of and I-680 and SR 84, paved or gravel driveways, structures, and residential and commercial properties) are not included in the acreage shown above.
2. Acreages rounded to the nearest hundredth, so values shown for each vegetation type in table may not add up to total acreage shown.

Trees

The project would have direct and indirect permanent impacts to trees through the removal of woodland habitat due to ground disturbance during construction or heavy pruning (described as removal of over 30 percent of the canopy). A total of 821 trees may be permanently impacted (removed or heavily pruned), and 231 trees may be temporarily impacted (compaction of root zone or minor pruning) by project activities. An approximately 10-foot-by-10-foot-area may be impacted around each tree that would be removed. Any paving within the Critical Root Zone (CRZ) of the tree would be considered a permanent impact to the tree. Temporary impacts would be a result of minor tree trimming or staging of equipment within the CRZ. Some areas would not be replanted due to conversion of natural vegetation communities to paved road. It is assumed that all trees in permanent impact areas would be removed; however, trees in and adjacent to temporary impact areas may not need to be removed. The exact number of trees removed would depend on field conditions such as the geology of the area where cut slopes are excavated, condition of trees, location of supporting roots, and other considerations to ensure the post construction stability of the permanent structures. Potential impacts of tree removal on sensitive wildlife such as nesting birds and bats are further discussed in Section 2.3.4.2. There is a potential for additional trees just outside of the ROW to be affected by soil compaction or excavation during construction or changes in hydrology after construction is completed.

Migratory Corridors and Habitat Fragmentation

The project is not anticipated to negatively impact wildlife movement between the west and east sides of I-680 or result in habitat fragmentation. The project would not result in a substantial increase in impermeable surfaces or a decrease in the vegetated ROW adjacent to the roadway. Temporarily impacted vegetation communities would be restored. Larger culverts used by wildlife to cross under I-680 would not be disturbed, or would be restored to their pre-project function at the completion of construction. Despite the presence of these crossings, I-680 remains a largely impermeable barrier to wildlife movement because there are few crossings relative to the length of the freeway. Therefore, the project would have minimal impact to existing wildlife movement corridors within project vicinity.

Construction activities have the potential to increase the nighttime light and glare sources compared to current levels. In particular, areas most sensitive to increased lighting and glare over natural conditions would be the riparian corridor and the drainages, which provide for a natural pathway for wildlife. Nighttime illumination is known to adversely affect some species of wildlife in natural areas. It can disturb breeding and foraging behavior and potentially alter breeding cycles of birds, mammals, and nocturnal invertebrates. In addition, light could deter some animal species, especially the larger mammals, from using rivers, creeks, and washes as a movement corridor. If uncontrolled, such lighting where proximal to these movement corridors could adversely impact the composition and behavior of the wildlife that occur in these areas. This impact is considered potentially substantial. In addition, the noise and vibrations from the operation of heavy equipment in active construction areas has the potential to substantially affect the movement of wildlife species. Measures to avoid or minimize potential light, glare, and construction noise and vibration impacts on wildlife are described in Section 2.3.4.4 (BIO-15).

It is expected that diurnal wildlife activities would be temporarily impacted and wildlife from immediately surrounding construction areas would be temporarily displaced. However, because these impacts would be temporary, construction would proceed along the corridor in phases, and

specific nighttime work measures would be implemented, impacts to diurnal wildlife activities are expected to be less than substantial. With the implementation of the measures discussed above, the level of impacts to nocturnal wildlife activities due to lighting and glare and by construction noise and equipment vibrations would be minimized.

Fish Passage

The project would not create a barrier to fish passage from its implementation, as it would not block or otherwise alter channel flow. No impacts would occur.

2.3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Vegetation Communities

BIO-1. The measures listed below would be implemented as part of construction to minimize and/or avoid impacts to sensitive vegetation communities, species, and habitat as well as to common biological resources.

- Before initiation of the proposed action, the qualifications of the biological monitor(s) would be submitted to USFWS and CDFW for approval. Such approved biologists are hereafter referred to as the “approved biologist(s).”
- The approved biologist(s) (knowledgeable about sensitive species and habitats in the action area) or designee(s) will conduct pre-construction surveys to examine the BSA for occurrences of special-status wildlife species, including nesting birds. In the event that occupied nests or other habitats are found, the approved biologist(s) will adhere to the measures set forth by the USFWS. If the situation is otherwise unique, the approved biologist will discuss the situation with a Caltrans biologist who would contact the USFWS and CDFW to determine how to avoid or relocate the resident animal(s).
- Construction Work, Access, and Staging Areas. All proposed construction will be limited to the existing and proposed ROW. Environmentally sensitive areas (ESAs) will be identified on contract plans and discussed in the Special Provision. The ESAs will include areas designated in the environmental document and biological reports that support wetlands, waters, and/or habitats that potentially support listed species, and have been specifically identified to avoid during construction. ESA provisions may include, but are not limited to, the use of temporary orange fencing to delineate the proposed limit of work in areas adjacent to sensitive resources, or to delineate and exclude sensitive resources from potential construction impacts. Contractor encroachment into ESAs will not be allowed. This includes staging/operation of heavy equipment or casting of excavation materials. ESA provisions will be implemented as a first order of work and remain in place until all construction is completed.
- Construction discharges. No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the State including waters of the United States or drainages. No discharges of excessively turbid water will be allowed, and all equipment will be well-maintained and free of leaks.

- **Onsite Worker Environmental Awareness Training.** Before the onset of construction and within 3 days of any new worker arrival, an approved biologist(s) will conduct an education program for all construction personnel. At a minimum, the training will include a description of California tiger salamander, California red-legged frog, Alameda whipsnake, and other listed species and their habitats; the potential occurrence of these species within the project footprint; an explanation of the status of these species and protection under the FESA, California Endangered Species Act (CESA), and all other federal, state, and local regulatory requirements; the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all construction crews and project personnel entering the project footprint. Upon completion of the program, personnel will sign a form stating that they attended the program and understand all of the avoidance and minimization measures and implications of the FESA, CESA, and all other federal, state, and local regulatory requirements.
- **Prevention of Wildlife Entrapment.** To prevent inadvertent entrapment of listed species during construction excavated holes or trenches more than 1 foot deep with walls steeper than 30 degrees will be covered at the close of each working day by plywood or similar materials. Alternatively, an additional 4-foot-high vertical barrier, independent of exclusionary fences, will be used to further prevent the inadvertent entrapment of listed species. If it is not feasible to cover an excavation or provide an additional 4-foot-high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks will be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape or the USFWS will be contacted by telephone for guidance. The USFWS will be notified of the incident by telephone and electronic mail within 48 hours.
- **Inspection of Pipes and Culverts.** All construction pipes, culverts, or similar structures that are stored at the project site for one or more overnight periods shall be securely capped before storage or inspected by the approved biologist before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a special-status species is discovered inside a pipe by the biologist or anyone else, the individual shall be allowed to leave its own accord, or if it can be safely captured, it shall be relocated by the biologist to a suitable location outside of the project area. The USFWS will be notified of the incident by telephone and electronic mail within 48 hours.
- **Erosion control.** Temporary erosion control and slope stabilization BMPs will be installed before the start of the wet season (October 15 through April 15). Erosion control measures may include silt fencing, straw wattles, straw bales, coir blankets, sediment traps, and other protective measures to minimize the potential for erosion of sediment beyond the work area or degradation of water quality in adjacent aquatic habitats.
- **Restoration/revegetation.** Upon project completion, all temporarily disturbed areas will be restored to pre-construction conditions.

- Wildlife exclusion fencing. Wildlife exclusion fencing will be installed along the project perimeter to keep wildlife out of construction areas.

BIO-2. Compensatory mitigation for temporary impacts to vegetation communities or Natural Communities of Concern under CEQA, including valley oak woodland, will be provided through the restoration of habitat by planting native species that are typical to that habitat. The restored vegetation communities will be monitored for success. If enough space is not available for on-site mitigation, off-site like-habitat providing these species habitat requirements will be preserved through the purchase of mitigation bank credits.

Trees

The general avoidance and minimization measures listed in Measure BIO-1 would reduce the effects to trees during project construction. The following measures are also proposed.

BIO-3. Post-construction measures will include revegetation of temporarily impacted areas by the planting of trees where appropriate, selecting sites based on existing topography, hydrology, and surrounding habitat. No riparian trees will be removed as a result of project activities.

Trees in permanent impact areas are likely to be removed during project activities. Some trees in temporary impact areas may be preserved depending on the specific activity occurring near them. Caltrans will reduce impacts to trees in temporary impact areas and along the edge of the project footprint to the greatest extent possible during construction by designating trees on plan sheets and marking protected areas (the CRZ) around trees with bright orange polypropylene ESA fencing. Most healthy trees can tolerate up to 25 percent of root cutting and recover from the loss. Trees that have roots cut on two sides usually suffer much more damage and are less stable. Trees that suffer root loss of greater than 25% or on three or more sides should be considered permanently impacted and removed.

Only those trees requiring removal will be cut down. Whenever possible, trees will be trimmed rather than removed. To avoid potential damage to retained trees, trees will be safeguarded during construction through implementation of the following measures as applicable:

- No construction equipment, vehicles, or materials shall be stored, parked, or staged outside of the project footprint or within the CRZ of trees that are outside of the project footprint. Only the CRZ of trees shown in the plan sheets as permanently impacted can be used for storage, parking, or staging; and
- Work will not be performed within the CRZ of trees to be retained without consultation with an ISA-certified arborist. If trees are damaged during construction and become unhealthy or die, the damaged tree(s) will be removed and replaced.

A Tree Protection Plan will be prepared and implemented to minimize damage to native trees during construction.

BIO-4. Final tree replanting and mitigation ratios will be determined in consultation with CDFW. Tree removal may be mitigated through planting at a 3:1 ratio on-site for native species within riparian areas, and for coast live oaks and valley oaks in oak woodlands. For other tree species, Caltrans may provide tree replacement on-site at a minimum 1:1 ratio in the space available. A 3:1 ratio is standard for replacement of impacted oak trees on Caltrans projects.

These ratios may be adjusted in consultation with CDFW, and ratios may also be based on size of tree removed, with large-diameter trees requiring greater replacement numbers than small trees. The need for some off-site tree planting may be required. Replanted areas will be monitored for success for up to 10 years. The performance criteria for replacement tree plantings is 70 percent survival of all plantings at the end of the monitoring period (3 to 10 years). If survival drops below 70 percent during the monitoring period, the project sponsor will replace plantings to bring survival above this level.

For any trees removed, pruned (i.e., cutting of branches that are greater than 1 inch in diameter), or planted within Alameda County ROW, a permit may be required under the Alameda County Tree Ordinance (Title 12, Chapter 12.11). The ordinance was adopted in 2003 and updated in December 2016 to preserve trees within County ROW by establishing standards and regulations for planting, maintaining, trimming, and removing. No designated species or diameters are outlined in the tree ordinance as requiring a specific replacement ratio. Impacted trees in Contra Costa County may be covered under the Contra Costa County Tree Protection and Preservation Ordinance.

In addition, California Senate Resolution No. 17 (1989) directs all state agencies to preserve and protect native oak woodlands to the greatest extent feasible. This resolution may be interpreted as no additional loss of oak trees in areas that historically supported oak woodlands.

Precise planting locations will be identified during the final design phase. Planting of trees will occur within the Caltrans ROW. Mitigation and restoration areas will be monitored for three years following the planting to ensure that the mortality rate does not exceed 30 percent of all trees planted. Details for off-site planting and riparian tree planting success criteria will be determined during the project permitting process with CDFW (1602 Streambed Alteration Agreement) and RWQCB (401 Certification).

Migratory Corridors and Habitat Fragmentation

BIO-5. Culverts in serviceable condition would be extended to address the proposed widening and to maintain existing drainage patterns, while undersized culverts would be replaced with larger sizes (i.e., any culvert under 16 inches in diameter will be enlarged to at least 16 inches, and to over 24 inches where space allows). This will maintain connectivity from the east and west sides of I-680.

Fish Passage

No avoidance, minimization, and/or mitigation measures are proposed.

2.3.2 Wetlands and Other Waters of the United States

2.3.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the CWA (33 USC 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over nontidal water bodies extends to the OHWM, in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material may be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the USACE with oversight by the USEPA.

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with USEPA's Section 404 (b)(1) Guidelines (40 CFR Part 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the USEPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a "least environmentally damaging practicable alternative" to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The EO for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency such as FHWA, and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

At the state level, wetlands and waters are regulated primarily by the SWRCB, the RWQCBs and the CDFW. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by WDRs and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. See Section 2.2.2 for additional details.

2.3.2.2 Affected Environment

This section is summarized from the *Aquatic Resource Delineation* (Horizon 2019) and *Natural Environment Study* (AECOM 2019d) for the proposed project, which were completed in January 2019 and August 2019, respectively.

A preliminary wetland delineation was conducted in 2018 to identify potentially jurisdictional wetlands and other (nonwetland) waters of the U.S. and waters of the State. A total of 0.24 acre of wetlands, 2.96 acres of waters of the U.S., and 1.01 acre of culverted waters were identified within the BSA. Mapped wetlands include freshwater marshes, and other waters identified include perennial, intermittent, and ephemeral channels. Detailed figures showing the locations of specific features are provided in the *Aquatic Resource Delineation* (Horizon 2019) and *Natural Environment Study* (AECOM 2019d).

Additionally, 53,724 linear feet of potentially nonjurisdictional waters of the U.S. were identified in the BSA. These include storm water features such as upland manmade drainage ditches, roadside ditches, concrete lined V-ditches, culverts, and pipes, as well as some culverts that do not connect wetlands or waters of the U.S. Nonjurisdictional features occur in depressions that drain only uplands, collecting storm water runoff from the highway, or are fed by water from culverts and sprinkler systems upslope. Storm water features that do not qualify as USACE jurisdictional may be regulated by CDFW and the RWQCB as waters of the State.

A preliminary jurisdictional wetland delineation was submitted to the USACE on November 18, 2019. USACE issued a preliminary jurisdictional delineation on April 7, 2020. Additional information about consultation and coordination with the USACE, CDFW, and RWQCB is provided in Section 3.2.

2.3.2.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect wetlands, other waters of the U.S., culverts, or potentially nonjurisdictional storm water features.

Build Alternative

Table 2.3.2-1 shows the total acreage and estimated impacts to potentially jurisdictional other waters of the United States. Depending on the availability of funding, the project could be constructed in phases (Section 1.4.1). Impact acreages are provided by phase and for the full Build Alternative.

Table 2.3.2-1: Wetlands and Other Waters of the U.S. in BSA and Impacts

Jurisdictional Water Type	Total in BSA ²	Permanent Impacts Phase 1 ^{1,3}	Permanent Impacts Phase 2 ^{1,3}	Permanent Impacts Full Build ^{1,3}	Temporary Impacts Phase 1 ^{1,4}	Temporary Impacts Phase 2 ^{1,4}	Temporary Impacts Full Build ^{1,4}	Total Impacts Full Build
Wetlands								
Emergent wetlands (freshwater marsh)	0.24	--	--	--	--	--	--	--
Other Waters of the U.S.								
Riverine perennial	2.53	--	--	--	--	--	--	--
Riverine intermittent	0.19	--	--	--	<0.01	--	--	<0.01
Ephemeral channel	0.20	--	--	--	<0.01	--	--	<0.01
Culverted waters	1.01	0.02	0.02	0.04	0.06	0.03	0.09	0.14
Total	4.17	0.02	0.02	0.04	0.07	0.03	0.09	0.15

Notes:

1. Acreages rounded to the nearest hundredth, so values shown for each wetland type in table may not add up to total acreage shown.
2. This total includes wetlands within waters, including freshwater marsh mapped within the OHWM of Vallecitos Creek.
3. Permanent impact areas are associated with conversion of natural communities to a built environment as a result of project features and construction activities.
4. Temporary impact areas involve damage to the natural community, which may be preserved depending on the specific activity occurring near them, such as construction staging or the siting of a construction access road that could disrupt habitat and/or damage natural communities and can be restored to their original natural community type.

The Build Alternative will temporarily impact less than 0.01 acre of potentially jurisdictional other waters of the United States. The impacts would be to four concrete- or riprap-lined ephemeral channels and one concrete-lined riverine intermittent channel, as a result of staging along the shoulder of I-680. No impacts to wetlands and no permanent impacts to potentially jurisdictional other waters of the U.S. are anticipated.

The project will permanently impact 0.04 acre and temporarily impact 0.09 acre of potentially jurisdictional culverted waters of the United States as a result of culvert upgrades and repairs.

Project activities have the potential to result in a total of 215 linear feet of permanent impacts to nonjurisdictional storm water features, including 166 linear feet from Phase 1 and 49 linear feet from Phase 2. Project activities have the potential to result in a total of 6,272 linear feet of temporary impacts to nonjurisdictional storm water features, including 1,316 linear feet from Phase 1 and 4,956 linear feet from Phase 2. Temporary impacts were assumed for features that the project would restore in place. Permanent impacts were assumed for features that the project would have to reconstruct (as close to possible to their original locations) in order to accommodate roadway widening and the construction of separate facilities to receive and treat roadway runoff.

Storm water features that would be affected by the proposed project would be replaced in kind within the project area, with priority for providing unlined ditches wherever possible. These features would be separate from any treatment areas for roadway runoff and from features preliminarily identified as wetlands or other waters of the United States. All replacement features would be in the Caltrans ROW.

Although project activities would impact four ephemeral channels and one riverine intermittent channel, the functions and values associated with these features would not be diminished. These features are highly disturbed, given their proximity to I-680. They are located on the downslope (west) side of the southbound I-680 and collect water through culverts, as well as sheet flow from the road. The impacts to these features are temporary, and the aquatic connections to downstream features would be restored. Due to the extremely small area of temporary impacts to concrete- or riprap-lined other waters of the U.S. (less than 0.01 acre) and lack of impacts to wetlands, a wetland avoidance alternative has not been developed. However, options to avoid the temporary impacts to other waters of the U.S. will be considered during final design.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

BIO-6. Standard Caltrans measures that are used for all projects include that a SWPPP and erosion control BMPs will be developed and implemented to minimize any wind or water-related material discharges, in compliance with the requirements of the Regional Water Quality Control Board (RWQCB) as well as the 2018 Caltrans Standard Specifications, Section 13. The SWPPP must also comply with the goals and restrictions identified in the RWQCB's Basin Plan. Any additional measures included in the Water Quality Certification will be implemented. The contractor will also comply with the following standards/objectives (or BMPs) including but not limited to the following:

- Where work areas encroach on wetlands, RWQCB-approved physical barriers adequate to prevent the flow or discharge of sediment into these systems will be constructed and maintained between working areas and streams, lakes, and wetlands.
- Discharge of sediment into culverts and storm drains will be held to a minimum during construction of the barriers.
- Discharge will be contained through the use of RWQCB-approved measures that will keep sediment from entering jurisdictional waters beyond the project limits.
- All off-road construction equipment should be cleaned of potential noxious weed sources (mud and vegetation) before entering the project footprint and after entering a potentially infested area before moving on to another area. The contractor will employ whatever cleaning methods (typically spraying with a high-pressure water hose) are necessary to ensure that equipment is free of noxious weeds.
- Equipment should be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools is not required. Equipment washing stations will be placed in areas that afford easy containment and monitoring (preferably outside of the project footprint) and that do not drain into sensitive (riparian, wetland, etc.) areas.

Upon completion of the project, all temporarily impacted areas will be restored to approximately original site conditions.

BIO-7. Under Federal and State guidance and rules, adverse, unavoidable impacts to wetlands and other aquatic resources require compensatory mitigation to offset the loss of the functions and values of the feature. Temporary impacts will be mitigated at a minimum 1:1 ratio. A 3:1 ratio is standard for permanent impacts to wetlands and other aquatic resources based on a project's risk of failure to compensate for impacts to wetlands (mitigation project), and the temporal loss, or reduction of functions, during the time it takes a mitigation project to achieve the targeted level of performance for all of its functions. Impacted culverts will be replaced in kind on site. No other mitigation is required.

2.3.3 Plant Species

2.3.3.1 Regulatory Setting

USFWS and CDFW have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the FESA and/or the CESA. Please see Section 2.3.5 for detailed information about threatened and endangered species.

This section of the document discusses all the other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 USC Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code, Sections 1900-1913, and CEQA, found at PRC Sections 21000-21177.

2.3.3.2 Affected Environment

This section is summarized from the *Natural Environment Study* (AECOM 2019d) for the proposed project, which was completed in August 2019.

A CNDBB (CDFW 2018b) search indicated that rare or sensitive plants have been recorded within 5 miles of the BSA. The CNPS online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2018) and USFWS species list (USFWS 2019; see Appendix C) were also consulted. Based on those sources and a review of the geographic ranges, habitat requirements, and proximity of recorded occurrences for the various species, the following four species were found to have low potential to occur.

- Congdon’s tarplant (*Centromadia parryi* ssp. *Congdonii*) is a California Rare Plant Rank (CRPR) 1B.1 listed species, meaning it is rare throughout its range and seriously threatened in California (CNPS 2020). Congdon’s tarplant is an annual herb that blooms from May through October (Calflora 2018). It occurs in valley and foothill grasslands, particularly those with alkaline substrates, and in slumps or disturbed areas where water collects in lower elevation wetlands. This subspecies tolerates disturbance and sometimes occurs in wet depressions of ruderal, non-native grassland habitat. There is potential habitat present in the grassland in the BSA, and there are CNDBB occurrences of the species within less than 1 mile from the BSA. However, all areas with potential habitat were surveyed during the species blooming period and no individuals were observed.
- Stinkbells (*Fritillaria agrestis*) is a CRPR 4.2 listed species, meaning it is of limited distribution and moderately threatened in California (CNPS 2020). Stinkbell is a perennial herb that blooms from March through June (Calflora 2018). It occurs in valley and foothill grasslands, chaparral, cismontane woodland, pinyon and juniper woodland,

particularly those with heavy clay soils, and sometimes serpentinite. There are no CNDDDB occurrences within 5 miles of the project area. There is potentially suitable habitat for the species in the grassland in BSA. However, all areas with potential habitat were surveyed during the species blooming period and no individuals were observed.

- Diablo helianthella (*Helianthella castanea*) is a CRPR 1B.2 listed species, meaning it is rare throughout its range and moderately threatened in California (CNPS 2020). Diablo helianthella is a perennial herb that blooms from March through June (Calflora 2018). It is associated with thin, rocky, well-drained soils. It is found in grassy openings in woodlands, chaparral, and coastal scrub, often at the transition zone between woodland and chaparral. It is found mostly in the hills east of the Bay, including in Mount Diablo State Park, Wildcat Canyon Regional Park, Briones Regional Park, Las Trampas Regional Wilderness, and surrounding areas. The nearest Calflora occurrence records are within 2 miles of the project area. Suitable habitat is limited in the BSA; therefore, it is not expected to occur.
- Bristly leptosiphon (*Leptosyne acicularis*) is a CRPR 4.2 listed species, meaning it is of limited distribution and moderately threatened in California (CNPS 2020). Bristly leptosiphon is an annual herb that blooms from April through July (Calflora 2018). It is found in chaparral, oak woodland, and coastal prairie habitats. There are no CNDDDB occurrences within 5 miles of the project area (CDFW 2018a). There is potentially suitable habitat for the species in the oak woodlands in the BSA. However, all areas with potential habitat were surveyed during the species blooming period and no individuals were observed.

These species would have some potential to occur in less disturbed grasslands and woodland openings in the BSA. Botanical surveys were conducted in May and June 2016, and June, July, and October 2018.¹⁴ No special-status plants were observed. However, not all project areas with suitable habitat were revisited during each round of surveys, and therefore focused floristic surveys did not coincide with blooming periods for all four species in all areas of suitable habitat. Some surveys were conducted after years of intense drought, which may have affected survey results. In addition, focused floristic surveys were not conducted in some areas of the study area due to lack of road shoulders, heavy traffic, or accessibility issues. Based on the surveys, it was determined there is a low potential for these species to occur within the project footprint.

2.3.3.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect special-status plant species in the project area.

Build Alternative

The proposed project would result in the permanent loss of grassland and woodland habitat that could support listed plant species. As shown in Table 2.3.1-1 (Section 2.3.1.2), the full project

¹⁴ Parts of the BSA overlap with the SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 297631/EFIS 0415000040), which was initially surveyed for plants in May and June, 2016.

would have permanent impacts to 0.13 acre of California annual grassland, 7.01 acres of ruderal grassland, and 0.45 acre of woodland. Given the low potential for Congdon's tarplant, stinkbells, Diablo helianthella, and bristly leptosiphon to occur in those habitats, implementation of Measure BIO-8 would avoid or minimize potential impacts to the species, if present. No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of Measures BIO-1 (Section 2.3.1.3) and BIO-6 (Section 2.3.2.4) would avoid potential indirect effects to special-status plants such as dust, spread of invasive species, or downstream changes in hydrology or sedimentation. The following measure is also proposed:

BIO-8. Before the commencement of construction activities, a qualified biologist shall conduct appropriately timed surveys for the listed plant species. To correspond with these species' blooming periods, the surveys shall include botanical inventories between March and June (to coincide with the blooming period of stinkbells, Diablo helianthella, and bristly leptosiphon) and May through October (the blooming period of Congdon's tarplant).

If listed plant species are discovered within the construction area, protective measures will be established. These protective measures will include setting a temporary protective buffer around the plants; ensuring all such plants are numbered, mapped, and identified in the field with pin flags; and conducting appropriate agency coordination. Special-status plant occurrences shall be avoided to the maximum extent possible. If impacts are unavoidable, a relocation plan will be prepared, and the species shall be hand-excavated, removed from within the construction area, and replanted at a suitable location within the Caltrans ROW. The species may be replanted in the temporarily impacted areas during the restoration phase of the project.

2.3.4 Animal Species

2.3.4.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), and CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Acts. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.5. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations relevant to wildlife include the following:

- NEPA
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- CEQA
- Sections 1600 – 1603 of the California Fish and Game Code
- Sections 4150 and 4152 of the California Fish and Game Code

2.3.4.2 Affected Environment

This section is summarized from the *Natural Environment Study* (AECOM 2019d) for the proposed project, which was completed in August 2019.

The identification of special-status animal species with potential to occur in the region was based on a search of the USFWS species list (USFWS 2019; see Appendix C), the CNDDDB (CDFW 2018b), the Western Bat Working Group's (WBWG) Regional Priority Matrix (WBWG 2018), previous wildlife studies, and familiarity with the region. Wildlife habitat assessments of the BSA were conducted in March 2016 and October 2018.¹⁵

Special-status species and wildlife movement corridors in the BSA are described below.

Western Pond Turtle

The northwestern pond turtle (*Actinemys marmorata marmorata*) and the southwestern pond turtle (*Clemmys marmorata pallida*) are subspecies of the western pond turtle. Both subspecies are listed as California species of special concern by the CDFW. Western pond turtles are aquatic, only leaving the water to reproduce and to aestivate or overwinter. Females move to upland locations to lay eggs in shallow nests during the summer months. Nests have been

¹⁵ Parts of the BSA overlap with the SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 297631/EFIS 0415000040), which was initially surveyed for wildlife habitat in March 2016.

observed in many soil types from sandy to very hard. Hatchlings are thought to overwinter in the nest and emerge in the spring, moving to aquatic habitats. Western pond turtles require slow or slack water habitat with available basking sites, such as logs and floating vegetation.

There are 24 CNDDDB occurrences of the species within 5 miles of the BSA, and five occurrences within 1 mile. The closest CNDDDB occurrence is 675 feet northeast of the BSA, within the Sheep Camp Creek area. Although protocol level surveys were not performed, wetlands and other waters in the BSA provide suitable aquatic habitat. Additionally, individuals occupying ponds and creeks in the vicinity of the BSA may disperse between aquatic sites or travel upland to nest or overwinter through the BSA or project footprint.

No western pond turtles were observed during field visits.

Western Burrowing Owl

Western burrowing owl (*Athene cunicularia hypugea*) is designated as a CDFW and USFWS species of concern. Burrowing owls prefer annual and perennial grasslands, typically with sparse or nonexistent tree or shrub canopies. In California, they are found in close association with California ground squirrel burrows, which provide them with year-round shelter and seasonal nesting habitat. Burrowing owls also use human-made structures such as culverts, debris piles, or openings beneath pavement as shelter and nesting habitat.

There are 14 CNDDDB occurrences of this species within 5 miles of the BSA, and two occurrences within 1 mile. The closest occurrence is approximately 0.4 mile east of the BSA in Pleasanton, from 1990. A more recent observation from 2009 is 0.5 mile east of the BSA.

Suitable grassland habitat is prevalent throughout the BSA. Ground squirrel burrows, though not present in high numbers within the project footprint, were observed within and adjacent to the BSA. No recent sign of burrowing owls (pellets or whitewash on burrow aprons) was observed during surveys.

San Francisco Dusky-Footed Woodrat

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) is listed as a California species of special concern. This species is found throughout the San Francisco Bay Area, generally in forested habitats with moderate canopy, year-round greenery, a brushy understory, and a sufficient supply of suitable nest building materials. Evergreen or live oaks and other thick-leaved trees and shrubs are important habitat elements for this species.

Two CNDDDB occurrences of the species are within 5 miles of the BSA. Both occurrences are from 2006; one is 1.4 miles west the BSA, along Alameda Creek, and the other is from 4 miles west of the BSA. Habitat conditions in the BSA along Vallecitos Creek, Arroyo del Valle, and Bernal Canal are suitable for dusky-footed woodrat; mixed woodlands within the project footprint contain evergreen and thick-leaved trees and shrubs typically associated with dusky-footed woodrat habitat, including coast live oak. Areas with fallen logs and other downed woody material are present, potentially providing suitable nest building material.

Potential woodrat middens were observed through the Vallecitos Creek riparian corridor. Middens have also been observed in trees adjacent to Bernal Canal, as well as at the base of trees within the BSA. Because of the presence of suitable habitat in the project footprint, including identification of numerous potential woodrat middens during field surveys, and the proximity of

known occurrences, it was determined that San Francisco dusky-footed woodrat is likely to occur in the BSA.

American Badger

American badger (*Taxidea taxus*) is a California species of special concern. American badgers are fossorial mammals that inhabit open grasslands and generally treeless regions. They burrow in friable soils in habitats with drier open shrubland, open forests, grasslands, savannah, desert, and herbaceous habitats.

The CNDDDB lists five historical occurrences within 5 miles of the BSA. The closest occurrence was 2 miles northwest of the BSA, in open grassland in the Camp Parks Range Area in Dublin. Some patches of less disturbed grassland area in the southern portion of the project area have open ground with rodent burrows that could provide habitat for this species. The species was not observed during field surveys.

Nesting Raptors

Several raptors including the Cooper's hawk (*Accipiter cooperii*), white-tailed kite (*Elanus leucurus*), and American peregrine falcon (*Falco peregrinus anatum*) may nest in the project area. Nesting raptors are protected under Section 3503.5 of the California Fish and Game Code, which states: "It is unlawful to take, possess, or destroy any birds in the orders falconiformes or strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

The Cooper's hawk is a CDFW species of special concern. The species primarily feeds on small birds such as robins, jays, doves and pigeons. Cooper's hawks breed in forested areas and build nests at heights of 25 to 50 feet in the tree canopy.

The white-tailed kite is a year-round resident in coastal and valley lowlands in California, and is a CDFW fully protected species. The species inhabits herbaceous and open areas of most habitats yet is rarely found away from agricultural areas. Nests are usually near open foraging areas.

The American peregrine falcon, a CDFW fully protected species, generally feeds and breeds near water. This species nests on protected ledges of high cliffs, banks, dunes, and mounds in woodland, forest, and coastal habitats. However, pairs are also known to nest on human-made structures such as bridges and buildings.

The CNDDDB lists 23 occurrences of special-status nesting raptors within 5 miles of the BSA. In addition, there are three 'suppressed' occurrences of falcon species within 5 miles of the BSA, not listed in the CNDBB. The CDFW range map for the white-tailed kite indicates that the BSA is in the species' year-round range. Oak woodlands and riparian corridors in and adjacent to the BSA may provide potential foraging habitat for Cooper's hawk. The American peregrine falcon may occasionally forage in the project area; however, the species is not likely to breed in the project footprint.

Although suitable breeding habitat is not present in the BSA for the sharp-shinned hawk (*Accipiter striatus*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), and prairie falcon (*Falco mexicanus*), these species may be found foraging within the area.

There is potential for nesting raptors to be present in and adjacent to the BSA in taller trees and in grasslands during construction. Overall, potential nesting habitat for raptors in the BSA is marginal.

Migratory Birds

All migratory birds in the BSA are protected by a single law, the Migratory Bird Treaty Act. Many species of migratory birds may inhabit the BSA at a time and would typically use similar resources. For this analysis, migratory birds are grouped into two categories: those that only forage and those that nest in and adjacent to the BSA.

Migratory birds that fall into the category of “foragers” are shorebirds and waterfowl that may stop in the San Francisco Bay Area during their migrations between the northern and southern hemisphere, or that overwinter yearly in the Bay Area. Hundreds of species of migratory shorebirds and waterfowl have been documented to occur in the Bay Area regularly.

California yellow warbler (*Setophaga petechia*), California horned lark (*Eremophila alpestris actia*), and loggerhead shrike (*Lanius ludovicianus*) are species that may breed in the area around the BSA, would be considered nesting birds, and are protected under the Migratory Bird Treaty Act. Tricolored blackbirds (*Agelaius tricolor*), great blue heron, and great egrets (*Ardea alba*) may forage in the BSA, particularly in the open grasslands and wetlands and riparian areas. There is no suitable nesting habitat, in marshes of sufficient size, for the tricolored blackbird, great blue heron, or great egret in the BSA.

No migratory birds were observed nesting in the BSA during the field visits. Migratory birds, such as great egret, blue heron, and black-crowned night heron (*Nycticorax nycticorax*), were observed in the BSA foraging in and adjacent to creeks along I-680 or migrating to other locations. The list of migratory birds comprises many different bird species, including many common species. Therefore, it is likely that the BSA would have several species of migratory birds at one time. Potential nesting locations in the BSA include roadside trees, dense shrubs, and human-made structures along the margins of the corridor. Migratory birds nesting along the project corridor would likely be tolerant of the disturbances and noise associated with the freeway and the surrounding residential area. Migratory birds could nest in the BSA during construction.

Special-Status and “High Priority” Bats

Seven bat species that are California species of special concern or on the WBWG list have the potential to be present in the BSA, to forage, roost, or breed: pallid bat (*Antrozous pallidus*), Townsend’s big-eared bat (*Corynorhinus townsendii*), Western mastiff bat (*Eumops perotis californicus*), Western red bat (*Lasiurus blossevillei*), hoary bat (*Lasiurus cinereus*), long-eared myotis (*Myotis evotis*), and Yuma myotis (*Myotis yumanensis*).

The WBWG Regional Priority Matrix shows the pallid bat, Townsend’s big-eared bat, Western mastiff bat, and Western red bat as “high priority” species, and the hoary bat, long-eared myotis, and Yuma myotis as “low priority” species. The WBWG defines “high priority” bat species as species that are imperiled or in high risk of imperilment and should be considered the highest priority for funding, planning, and conservation actions. For “low priority” bat species, most of the existing data indicate stable populations of the species, and the potential for major changes in status in the near future are unlikely (WBWG 2018).

Many bat species are sensitive to disturbance at the roost. When disturbed, they generally retreat into crevices, and with repeated disturbance, they may abandon the roost. Among threats to California bat species are habitat loss and pressures from human-induced changes to the landscape.

The CNDDDB lists eight special-status bat occurrences within 5 miles of the BSA. No roosting bats or signs of roosting bats were found during reconnaissance surveys, but all of the bridges within the BSA were found to have suitable day roost and night roost habitat.

There is no suitable breeding habitat for the Western mastiff bat, Western red bat, hoary bat, or long-eared myotis in the project footprint. Potential natal roosts for the pallid bat are present in the trees and human-made structures that exist in the BSA. The Townsend's big-eared bat and Yuma myotis may forage or roost in larger tree crevices within the BSA. Large trees within and near the BSA may provide suitable roosting habitat if cavities, hollows, and/or sufficiently furrowed or sloughing bark is present. Trees large enough to support maternity roosts up to 100 individuals are not present in the project footprint. Bat species may also use the project footprint and BSA for foraging and temporary occupancy (e.g., night roosts for prey consumption). More suitable open foraging habitats occur outside in fields and grasslands throughout the BSA.

Pallid bat occurs throughout much of California, where it may occur in a wide variety of grasslands, shrublands, and woodlands, though they are generally found in dry, open areas at lower elevations. There is one occurrence of pallid bat within 5 miles of the BSA.

Townsend's big-eared bat occurs throughout California except at high elevations. There are several occurrences of Townsend's big-eared bat within 5 miles of the BSA.

Yuma myotis is common throughout California except for the arid Mojave and Colorado Desert regions. There are two occurrences of Yuma myotis recorded within 5 miles of the BSA.

2.3.4.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect animal species in the project area.

Build Alternative

Effects of the Build Alternative are described by species below. No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

Western Pond Turtle

No impacts to western pond turtles are anticipated with implementation of the avoidance and minimization measures listed in Section 2.3.4.4. Potential impacts to western pond turtles, if present in the BSA, would include temporary and permanent loss of upland dispersal and nesting habitat and aquatic basking habitat. However, loss of habitat would be minimal compared to the amount of habitat available in the project vicinity.

It is not anticipated that noise or activity levels from construction activities would produce a recognizable increase in the amount of noise or activity currently experienced in the BSA. Implementation of the avoidance and minimization measures described above would prevent any disturbance to western pond turtle.

Western Burrowing Owl

Very few ground squirrel burrows were found in the project footprint. Much of the grassland in the project footprint is on compacted soils, which are less suitable for burrowing. Additionally, no burrowing owls or sign of occupied burrows were observed during biological surveys in the project footprint. Based upon these observations, burrowing owls are not expected to breed in the project footprint. If an individual occurred in the project footprint, it is expected to forage or fly through the area. Due to the transitory aspects of these behaviors, this species is not expected to be impacted by the project.

San Francisco Dusky-Footed Woodrat

The proposed project may result in the permanent and temporary impacts to potentially suitable habitat for the San Francisco dusky-footed woodrat. Permanent impacts would be associated with tree removal within woodland habitat. Temporary habitat loss could be associated with maneuvering of equipment during construction, staging, access, utilities, laydown, and the installation and temporary operation of traffic control infrastructure in the riparian corridor.

Implementation of the proposed project could also result in both direct and indirect effects on woodrat nests and associated individuals. Construction impacts would be associated primarily with nest sites because woodrats are nocturnal and would most likely be restricted to their nest sites during daytime construction.

Nest destruction could result from vegetation clearing and removal (including tree removal) during project construction. Nest sites are particularly important to woodrat population structure; nests are built over decades and females typically inhabit nests for life, passing them on to female offspring. Therefore, a loss of nest sites would also likely result in the mortality of the individuals inhabiting those nest sites, including associated litters. However, implementation of avoidance and minimization efforts, such as development and implementation of a trapping and nest relocation effort would reduce these potential effects.

Vegetation clearing and removal (including tree removal) during project implementation could also result in the removal of available nest construction material (e.g., sticks), which could indirectly limit the ability of woodrats, if present, to construct and maintain nest sites in the vicinity. Project-related indirect effects could include increased erosion, sedimentation, or changes in hydrology, any of which could occur either during or after construction. For example, the removal of vegetation could lead to increased potential for erosion and sedimentation of soils, affecting adjacent habitat for woodrats outside the project footprint. Nonetheless, these indirect effects will be avoided through implementation of avoidance and minimization measures for water quality, erosion control, and construction site BMPs, and the SWPPP, as well as the measures listed in Section 2.3.4.4.

American Badger

The project footprint contains some small mammal burrows and provides potential den and foraging habitat for American badger. The proposed project would result in the permanent loss of upland habitat potentially used by the species and temporary impacts to potential upland habitat. Construction-related noise could affect active dens potentially occurring in the immediate project vicinity. Given the abundance of similar grazed grassland in the project

vicinity, and that American badger is not state or federally listed, the project related loss of habitat would not be considered substantial. No indirect impacts are expected to occur.

Although the project would result in the permanent loss of potential dispersal and denning habitat, replanting of the temporarily disturbed areas with native erosion control species would result in improvements to American badger habitat within the project footprint. As such, the proposed project would also not create a barrier to badger movement. The implementation of the measure listed in Section 2.3.4.4 would minimize impacts to American badger.

Nesting Raptors

Project-related activities have the potential to permanently impact raptor nesting and foraging habitat. Construction activities such as vegetation clearing and removal (including tree removal), excavation, and other project-related ground disturbances or equipment operation associated with the proposed project could affect raptors nesting in vegetation in or adjacent to work areas. Tree removal could result in direct loss of active nest sites, if nest sites are present within the project footprint. Project construction activities, particularly noise and vibration, also could result in temporary disturbances to active nests or individuals foraging in areas near the BSA that could cause individuals to avoid using adjacent areas or cause nests to be abandoned. The implementation of the measures listed in Section 2.3.4.4 would minimize impacts to nesting raptors.

Migratory Birds

Project-related activities have the potential to permanently impact nesting or foraging migratory birds and their habitat. Construction activities such as vegetation clearing and removal and other project-related ground disturbances or equipment operation associated with the proposed project could affect raptors nesting in vegetation in or adjacent to work areas. Tree removal could result in direct loss of active nest sites, if nest sites are present within the project footprint. Project construction activities, particularly noise and vibration, also could result in temporary disturbances to active nests or individuals foraging in areas near the BSA that could cause individuals to avoid using adjacent areas or cause nests to be abandoned. However, by following measures discussed in Section 2.3.4.4 for nesting raptors, in addition to the specific measures listed in that section for migratory birds, impacts leading to take of individuals would be avoided.

Special-Status and “High Priority” Bats

Implementation of the proposed project could result in the disturbance and removal of suitable roosting and nesting sites for the pallid bat, Townsend’s big-eared bat, and Yuma myotis. Disturbance of bats is of particular concern during the maternity roosting season (April 15 through August 31), when bats are likely to be raising young. Removal of trees, construction noise and vibration, and lighting may impact bats. Disruption of suitable roosting and nesting sites would potentially have a temporary negative effect on bats; however, the proposed project would not permanently remove bat habitat, and with the avoidance and minimization measures listed in Section 2.3.4.4, there would be no long-term negative effect on bats.

Temporary disturbance to daytime or maternity roosts adjacent to the project footprint could result from project-related construction noise and vibration. Measures such as preconstruction surveys, buffers, and a work window will be implemented to avoid and minimize impacts on roosts, if any roosts are found adjacent to the BSA. Therefore, project construction is not

expected to cause an adverse impact on adjacent roosts for bats. Implementation of the avoidance and minimization measure described in Section 2.3.4.4 would prevent any additional disturbance of roosting bats. Permanent impacts to these species would be mitigated through the replacement of removed trees, and habitat fragmentation or a loss of suitable foraging habitat would be minimal. Temporary disturbance to individuals foraging or temporarily roosting at night (while consuming prey) caused by noise, vibration, and physical disturbance from equipment movements will be minimized by specific nighttime work avoidance and minimization measures.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

Western Pond Turtle

The following avoidance and minimization measure, in addition to those identified in Measures BIO-1 (Section 2.3.1.3) and BIO-6 (Section 2.3.2.4), will be implemented to avoid impacts to western pond turtle:

BIO-9. Before any construction activities begin, an approved biologist(s) shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the western pond turtle and its aquatic and upland nesting habitat, the general measures that are being implemented to conserve the western pond turtle as they relate to the project, and the boundaries within which the project may be accomplished.

An approved biologist(s) shall survey the work site no more than 48 hours before the onset of activities for signs of western pond turtles and/or western pond turtle nesting activity (i.e. recently excavated nests, nest plugs) or nest depredation (partially to fully excavated nest chambers, nest plugs, scattered egg shell remains, egg shell fragments). Preconstruction surveys to detect western pond turtles should focus on suitable aerial and aquatic basking habitat such as logs, branches, rootwads, and rip-rap, as well as the shoreline and adjacent warm, shallow waters where pond turtles may be present below the water surface beneath algal mats or other surface vegetation. Preconstruction surveys to detect western pond turtle nesting activity should be concentrated within 402 meters (1,319 feet) of suitable aquatic habitat and should focus on areas along south- or west-facing slopes with bare hard-packed clay, silt soils, or a sparse vegetation of short grasses or forbs. If western pond turtles or their nesting sites are found, the biologist shall contact CDFW to determine whether relocation and/or exclusion buffers and nest enclosures are appropriate. If CDFW approves of moving the animal, the biologist shall be allowed sufficient time to move the western pond turtle(s) from the work site before work activities begin.

Nesting Raptors and Migratory Birds

Measure BIO-1 (Section 2.3.1.3) would minimize potential impacts to birds that have the potential to nest and forage within the BSA. Migratory Bird Special Contract Provisions will be adhered to in order to avoid potential effects to special-status bird species. Caltrans will employ the use of a qualified biologist to implement avoidance and minimization measures. The measures below will be implemented for construction work during the nesting season (February 1 through September 30).

BIO-10. Preconstruction surveys for raptors will be conducted within 500 feet of the construction area, and surveys for other special-status birds and appropriate nesting habitat will be conducted within 50 feet of the construction area, no more than three days before ground disturbing activities. If passerine nests are found within or adjacent to the construction area, a 50-foot buffer will be established, which is typically done using bright orange polypropylene ESA

fencing. Raptor nests will receive a 500-foot avoidance buffer. An approved biologist(s) will conduct weekly monitoring during construction, to evaluate the identified nest for potential disturbances associated with construction activities. Construction within the buffer is prohibited until the approved biologist(s) determines the nest is no longer active. If an active nest is found after construction begins, construction activities in the vicinity of the nest will stop until an approved biologist(s) has evaluated the nest and established the appropriate buffer around the nest. If establishment of the buffer is not feasible, CDFW will be contacted for further avoidance and minimization guidelines.

Western Burrowing Owl

Measure BIO-1 (Section 2.3.1.3) would minimize potential impacts to western burrowing owls. Migratory Bird Special Contract Provisions will be adhered to in order to avoid potential effects to special-status bird species. The following measure is also proposed:

BIO-11. Appropriate avoidance, minimization, or protection measures shall be determined in consultation with the CDFW in the event an active burrow is in an area subject to disturbance, or within the typical setback (i.e., occupied burrows or nests within 150 feet of an area subject to disturbance during the nonbreeding season, or within 250 feet of an area subject to disturbance during the breeding season).

San Francisco Dusky-Footed Woodrat

BIO-12. To avoid or minimize potential impacts on San Francisco dusky-footed woodrat, Caltrans will implement the following measure as part of the proposed project:

- **Preconstruction Surveys for San Francisco Dusky-Footed Woodrat.** Before the start of construction, an approved biologist(s) will conduct a survey of the project footprint and a 30-foot buffer beyond the project footprint boundaries to determine the location of active and inactive woodrat dens. Any dens detected during the surveys will be recorded and mapped in relation to the construction disturbance footprint. In addition, the biologist will evaluate any signs of current woodrat activity, including the presence of fresh scat, freshly chewed vegetation, and the presence of cobwebs covering nest entrances. A 30-foot equipment exclusion buffer will be established around active and inactive dens that can be avoided; within such buffers, all vegetation will be retained and nests will remain undisturbed.
- **Potential Trapping and Relocation.** A woodrat trapping and relocation plan will be developed and implemented before project construction for any nest site that will be directly affected by the proposed project. Specific methods for trapping woodrats and relocation of individuals and their nest sites, as well as identification of suitable sites for relocation, include:
 1. Trapping at all woodrat middens mapped within the project's temporary and permanent impact areas,
 2. Installing relocation midden structures,
 3. Relocating trapped woodrats to the relocation midden structures, and
 4. Dismantling existing woodrat middens in the project area to be cleared, to discourage woodrat reoccupation.

If suitable habitat is not available for relocation of the woodrats in the project vicinity, offsite locations will be identified. Trapping of the woodrats will be conducted by an approved biologist(s) with a current CDFW collection permit to trap and relocate the species. Ideally, the trapping will occur outside of the breeding period, between September and December.

American Badger

BIO-13. The following measures will be implemented to avoid and minimize potential impacts to the American badger.

- Preconstruction surveys will be conducted within the project footprint in areas of suitable habitat to identify dens or signs of American badger. These surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out.
- If an American badger is detected on site at any time during these surveys, CDFW will be contacted to discuss ways to proceed with the project and to avoid take to the maximum extent practicable.

Special-Status and “High Priority” Bats

Implementing the following measure, in conjunction with Measure BIO-15 relating to nighttime work and construction noise and vibration impacts, will avoid or minimize potential effects to bats.

BIO-14. No more than two weeks before tree removal, a qualified biologist will conduct a preconstruction survey for crevice and cavity roosting habitat for all areas that provide suitable bat roosting habitat, including human-made structures, snags, rotten stumps, mature trees with broken limbs, exfoliating bark, and dense foliage. Sensitive habitat areas and roost sites will be avoided to the maximum extent practicable. To avoid mortality and reproductive loss, Caltrans may limit tree removal to between September 1 and April 14, outside the breeding season, so as not to disturb maternal colonies or roosts. If potential roost sites (e.g., trees, snags) are to be removed or trimmed, limbs smaller than 3 inches in diameter will be cut and the tree will be left overnight to allow any bats using the tree/snag for roosting time to leave and find another roost. A biological monitor will be present during the trimming or removal of trees/snags. If occupied sites are observed in the BSA, Caltrans will contact CDFW to report occurrences for the agency’s database. Caltrans will provide an appropriate buffer between any occupied roost and construction activities. In addition, nighttime construction will be limited. Measures relating to nighttime work include those outlined in Measure BIO-15, as well as the following:

- Bat Day and Night Roost Avoidance. If deemed necessary, specific day and night bat roost avoidance and minimization measure will be developed through technical assistance with CDFW and bat specialists.

General Measure

BIO-15. Potential light, glare, and construction noise and vibration impacts on wildlife will be addressed through the following measures:

- Use lighting in areas only where necessary for safety and signage. Eliminate all lighting in other areas.

- All lighting should be downcast to minimize lighting of natural areas, particularly in riparian areas and adjacent to drainages.
- Limit operation of vibration causing equipment such as pile drivers, dozers, and large excavators to daylight hours when working in areas adjacent to open space.
- A biological monitor shall be present to observe activities of wildlife during nighttime construction adjacent to open spaces. If activities are noted to affect wildlife, the biological monitor shall stop construction activities as necessary.

2.3.5 Threatened and Endangered Species

2.3.5.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the FESA: 16 USC Section 1531, et seq. See also 50 CFR Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as FHWA (and the Caltrans, as assigned), are required to consult with the USFWS and NOAA Fisheries to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take Statement, or a Letter of Concurrence. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the CESA, California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFW is the agency responsible for implementing CESA. Section 2080 of the California Fish and Game Code prohibits “take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the California Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

2.3.5.2 Affected Environment

This section is summarized from the *Natural Environment Study* (AECOM 2019d), which was completed in August 2019, and the *Biological Assessment* (AECOM 2019e), which was completed in October 2019.

Species lists were requested and obtained from the USFWS and NMFS and are included in Appendix C. The identification of threatened or endangered species with potential to occur in the region was based on a search of the USFWS and NMFS species lists, the CNDDB (CDFW 2018b), previous studies, familiarity with the region, and field surveys completed for the project in 2016 and 2018-19.

The following federally and state-listed wildlife species have potential to occur, or are known to occur, within the BSA.

- California tiger salamander (*Ambystoma californiense*), federally threatened, California threatened;
- California red-legged frog (*Rana draytonii*), federally threatened, California species of special concern; and

- Alameda whipsnake (*Masticophis lateralis euryxanthus*), federally threatened, California threatened.

Resident rainbow trout (*Oncorhynchus mykiss*) populations may be present in the watershed, but no creeks or drainages within the BSA support federally or state-listed anadromous fisheries, as described in Section 2.3.1.1 under “Fish Passage.”

Information about these species and their potential presence in the BSA is presented below.

California Tiger Salamander

The California tiger salamander, a federally and state-listed threatened species, inhabits grasslands and open oak woodlands in central and northern California. The species is estimated to have disappeared from more than 50 percent of its historic range due to habitat loss from agriculture and urbanization and the introduction of nonnative aquatic predators (CDFG 2010b). The range of California tiger salamanders is currently restricted to the Central Valley and the South Coast Range of California from Butte County south to Santa Barbara County.

California tiger salamanders breed in temporarily ponded environments surrounded by uplands that support small mammal burrows. Vernal pools or seasonal human-made ponds provide ideal breeding habitat. Water must remain for at least 12 weeks or long enough for the aquatic larvae to complete development. Although breeding usually occurs in fish-free ephemeral ponds that form during the winter and dry out in summer, some salamanders may also breed in slow streams and in some semi-permanent to permanent waters including cattle ponds (provided that aquatic vertebrate predators are not present), probably due to the loss of ephemeral ponds in their habitat. Apart from breeding and larval development, California tiger salamanders spend the majority of their lives in subterranean refuges. These sites are typically referred to as aestivation locations, although it appears that California tiger salamanders remain active for much of the time they are underground (USFWS 2005a). Small mammal burrows, especially those made by ground squirrels (*Spermophilus* spp.), and soil crevices in upland grassy habitat provide refugia sites for juvenile and adult salamanders.

After winter rains have begun to fill breeding sites with water, the salamanders emerge from their refugia and migrate to breeding pools. Females deposit eggs singly or in small groups in the water, attaching them to submerged vegetation or debris. Larvae usually complete metamorphosis after 3 to 6 months. Larvae typically metamorphose and leave their natal ponds as the water dries up during the summer months. When breeding occurs in perennial ponds, larvae may over-summer in the water (Shaffer et al. 1993).

After metamorphosis, juveniles spend a few days at the pond margin before migrating to underground refugia. Overland migration has been documented to extend up to 1.24 miles (USFWS 2005a), but most California tiger salamander remain within a half mile of their breeding ponds (69 Federal Register 47212). A dispersal distance of 0.7 mile between breeding ponds is thought to account for 99 percent of the inter-pond movement of breeding adults (USFWS 2005a).

The BSA is not within designated critical habitat for the current distribution of the Central California Distinct Population Segment (USFWS 2005a).

No California tiger salamanders were observed during field visits. There are 70 CNDDDB records within 5 miles of the BSA, and six occurrences within 1 mile. One CNDDDB occurrence is within the BSA; a single CNDDDB occurrence from 1988 consisted of a live California tiger salamander found along SR 84 (Vallecitos Road), approximately 0.5 mile east of the I-680 off-ramp (#581; CDFW 2018b). SFPUC surveys have documented California tiger salamander at the Sheep Camp Creek area, a bioregional habitat restoration program site established by SFPUC as part of its Water System Improvement Program (CDFW 2018b). The Sheep Camp Creek area is directly north of SR 84 between Little Valley Road and I-680. Breeding California tiger salamanders were detected as recently as 2016 in three stock ponds within the restoration area, approximately 0.25 mile northeast of the BSA.

Protocol-level surveys were not performed because, given the proximity of known populations, presence of California tiger salamanders in the BSA can be reasonably inferred. Individuals breeding in nearby ponds may travel through or to suitable upland dispersal and refugia habitat within the project footprint. Intermittent and ephemeral drainages throughout the BSA serve as aquatic migration corridors and foraging habitat. I-680 represents a major barrier to dispersal of California tiger salamanders. The paved surface of I-680 is not considered to be a viable dispersal corridor for California tiger salamanders because heavy traffic likely causes high mortality of individuals attempting to cross. There are several natural and artificial wildlife crossings within the BSA that could potentially be used by dispersing California tiger salamanders to cross under I-680, including underpasses such as the one at Koopman Road, and culverts carrying streams and drainage channels under the freeway. However, I-680 remains a largely impermeable barrier to movement despite the presence of these crossings, because there are few of them relative to the length of the freeway. Individual California tiger salamanders entering the BSA from adjacent areas are much more likely to encounter the traffic lanes of I-680 than a viable crossing point. No dispersal corridors exist within the BSA north of Bernal Avenue due to urban development immediately adjacent to one or both sides of I-680 in those areas.

Although California tiger salamanders typically breed in ephemeral ponds, there is potentially suitable breeding habitat for the species in the reaches of Vallecitos Creek with slow-moving waters (USFWS 2016). However, Vallecitos Creek does not fall within the impact area of the project. Therefore, the project would not directly affect potential breeding habitat. The project would have temporary and permanent impacts to upland dispersal, foraging, and aestivation habitat.

California Red-Legged Frog

The California red-legged frog, federally listed as threatened and a California species of special concern, is distributed throughout 26 counties in California but is most abundant in the San Francisco Bay Area. Populations have become isolated in the Sierra Nevada, northern Coast, northern and southern Transverse, and Peninsula ranges (Jennings and Hayes 1994; Stebbins 2003). California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,920 feet in elevation (Jennings and Hayes 1994; Bulger et al. 2003; Stebbins 2003).

California red-legged frogs breed between November and April in standing or slow-moving water that is at least 2½ feet deep with emergent vegetation, such as cattails, tules

(*Schoenoplectus* spp.), or overhanging willows (*Salix* spp.) (Hayes and Jennings 1988). Aquatic breeding habitat should hold water for a minimum of 20 weeks in most years and have salinity less than 7.0 parts per thousand. Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925; Jennings and Hayes 1994). Larvae undergo metamorphoses 3.5 to 7 months after hatching and reach sexual maturity at 2 to 3 years of age (Jennings and Hayes 1994). California red-legged frogs have been found in drainages and ephemeral pools but prefer deeper pools associated with dense riparian stands.

In a study of California red-legged frog terrestrial activity in the Santa Cruz Mountains, Bulger et al. (2003) categorized terrestrial use as migratory and nonmigratory. Nonmigratory activity occurred from two days to several days and was associated with precipitation events. Migratory movements are characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger reported that nonmigrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover (i.e., California blackberry, poison oak, and coyote brush). However, dispersal during winter rain events for juvenile and adult California red-legged frog has been recorded as up to 2 miles (USFWS 2002a).

Accessibility to shelter within a watershed is a very important component to the survival of the California red-legged frog and can be a limiting factor in population numbers. Sheltering habitat can be aquatic, riparian, and upland areas (including California annual grasslands, ruderal habitat, woodlands and shrub habitats). Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry. Areas of potential upland and aquatic habitat exist in various vegetation communities throughout the BSA. Agricultural features within the BSA, such as drains, water troughs and ephemeral pools, can be considered sheltering habitat. Migration within the BSA could occur through interconnected dispersal systems provided by drainages adjacent to, and culverted drainages running under, SR 84 and I-680. Slow-moving and ponded areas of Vallecitos Creek and its in-stream wetlands offer potential breeding habitat. The presence of the California red-legged frog as a migrant, aestivating, or breeding in aquatic habitat is reasonably certain to occur within the BSA.

Critical habitat for the California red-legged frog was designated by the USFWS in April 2006 and revised in March 2010 (USFWS 2010). The BSA does not contain designated critical habitat for California red-legged frog.

One California red-legged frog was observed along Vallecitos Creek, just outside of the BSA, during a field visit conducted in October 2018. There are 66 CNDDDB records within 5 miles of the BSA, and six occurrences within 1 mile (CDFW 2018b). SFPUC surveys in 2015 documented California red-legged frogs at the Sheep Camp Creek area (CDFW 2018b) along a drainage 750 feet east of the BSA.

Protocol-level surveys were not performed because, given the proximity of known populations, presence of California red-legged frogs in the BSA can be reasonably inferred. Similar to California tiger salamander, individuals breeding in nearby ponds may travel through or to suitable upland dispersal, foraging, and refugia habitat in the project footprint. Intermittent and ephemeral drainages throughout the BSA serve as aquatic migration corridors and foraging habitat. Due to the consistently high level of traffic and concrete median barrier on I 680, I-680 is considered a barrier to above ground wildlife movement. There are several natural and

artificial wildlife crossings within the BSA that could potentially be used by dispersing California red-legged frogs to cross under I-680, including underpasses such as Koopman Road, and culverts carrying streams and drainage channels under the freeway. However, I-680 remains a largely impermeable barrier to movement despite the presence of these crossings, because there are few of them relative to the length of the freeway. Individual California red-legged frogs entering the BSA from adjacent areas are much more likely to encounter the traffic lanes of I-680 than a viable crossing point. No dispersal corridors exist within the BSA north of Bernal Avenue due to urban development immediately adjacent to one or both sides of I-680 in those areas.

There is also potential for the species to breed in the reaches of Vallecitos Creek with slow-moving waters. However, no impacts are anticipated to Vallecitos Creek.

Alameda Whipsnake

The Alameda whipsnake is federally and state-listed as threatened. Alameda whipsnakes inhabit the northern coastal and chaparral habitats of Contra Costa and Alameda Counties (USFWS 1997). They predominantly make use of coastal sage scrub and chaparral. However, recent studies have shown that Alameda whipsnake can be found in a wider variety of habitats than previously thought. For example, whipsnakes have been found in grasslands with very little scrub present, in coastal scrub with dense canopy cover, and in patches of scrub less than 0.5 acre in size (Swaim 1994). Therefore, habitat associations for this subspecies should include those that co-occur in the general chaparral/scrub habitat mosaic (Alvarez 2005). Rock outcrops with deep crevices or abundant rodent burrows are important habitat components for overnight dens, refuges from predators and excessive heat, and foraging (Swaim 1994). These forms of shelter provide snakes with habitats for temperature regulation, egg-laying sites, and winter hibernaculum (winter residence where the snakes hibernate). Alameda whipsnakes spend November through March in a winter hibernaculum (USFWS 2000).

The BSA lies adjacent to (within 20 feet of) the far eastern edge of Unit 3 (Hayward Pleasanton Ridge population) of USFWS Designated Critical Habitat for the Alameda whipsnake. Within the designated habitat, primary constituent elements (PCEs) are in areas that support scrub communities including mixed chaparral, chamise-redshank chaparral, coastal scrub, and annual grassland and various oak woodlands that lie adjacent to scrub habitats (USFWS 2000). In addition, the PCEs for the Alameda whipsnake may be found in grasslands and various oak woodlands that are linked to scrub habitats by substantial rock outcrops or riparian corridors.

Protocol-level surveys for Alameda whipsnake were not conducted in the BSA because of the lack of suitable coastal sage scrub and chaparral habitat, and because the USFWS bases determination of effects to Alameda whipsnake on presence of suitable habitat. The USFWS does not accept surveys as proof of absence of Alameda whipsnake. Alameda whipsnakes are cryptically colored, secretive, and highly sensitive to human activities, therefore individual snakes are difficult to detect unless they are observed undisturbed at a distance (USFWS 2004).

No Alameda whipsnakes were observed during field surveys. The CNDDB lists 80 occurrence polygons within 5 miles of the BSA. Detailed location information about these occurrences was provided through personal communication with CDFW (CDFW 2018c). The closest occurrences of the Alameda whipsnake are from 1991, 1 mile west of the BSA, and from 1996, 2 miles west of the BSA.

PCEs for the whipsnake may be found in grasslands and various oak woodlands that are linked to scrub habitats by substantial rock outcrops or riparian corridors. The dominant habitat type throughout the BSA is California annual grassland, but also includes riparian and upland oak woodland and coyote brush scrub. No chaparral habitat, a PCE for the Alameda whipsnake, exists in or within 500 feet of the BSA. Additionally, the BSA is not part of a habitat mosaic that contains scrub/chaparral habitat. Although the BSA has only small areas of scrub habitat likely to support the Alameda whipsnake, it is within a corridor that the USFWS has proposed to establish connectivity between the Alameda whipsnake recovery unit on Pleasanton Ridge (Unit 7) and the Sunol-Cedar Mountain Recovery Unit (Unit 5) south of San Antonio Reservoir (USFWS 2002b).

The Alameda whipsnake has been documented in the vicinity, and because the species has been found in grassland habitats, there is some potential that the species could move through the project footprint. However, the species would not permanently reside on or near the project footprint given the absence of nearby scrub/chaparral habitats. Nearby CNDDDB occurrences all include chaparral in the habitat description for the occurrence location. Because the BSA consists mainly of grassland and oak woodlands that are not adjacent to chaparral, the BSA is not expected to support breeding Alameda whipsnake, but whipsnake may pass through the project area as migrants foraging.

2.3.5.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not affect threatened or endangered species in the project area.

Build Alternative

Table 2.3.5-1 summarizes the anticipated effect findings for all federally listed species identified in the USFWS and NMFS lists (Appendix C). The anticipated effects for potentially affected species are described in more detail below.

Table 2.3.5-1: Federal Endangered Species Act Effect Findings

Common Name	Scientific Name	Status*	Effect Finding	Effect Finding for Critical Habitat (if applicable)
Invertebrates				
conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE	No effect	Not applicable
longhorn fairy shrimp	<i>Branchinecta longiantenna</i>	FE	No effect	Not applicable
vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	No effect	Not applicable
San Bruno elfin butterfly	<i>Callophrys mossii bayensis</i>	FE	No effect	Not applicable
Bay checkerspot butterfly	<i>Euphydryas editha bayensis</i>	FT	No effect	Not applicable
vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	No effect	Not applicable
callippe silverspot butterfly	<i>Speyeria callippe callippe</i>	FE	No effect	Not applicable
Fish				
Delta smelt	<i>Hypomesus transpacificus</i>	FT	No effect	Not applicable
steelhead - Central California Coast ESU	<i>Oncorhynchus mykiss</i>	FT	No effect	Not applicable
Chinook salmon – Central Valley spring-run	<i>Oncorhynchus tshawytscha</i>	FT	No effect	Not applicable
Chinook salmon – winter run, Sacramento River	<i>Oncorhynchus tshawytscha</i>	FE	No effect	Not applicable
Amphibians				
California tiger salamander	<i>Ambystoma californiense</i>	FT	May affect, and is likely to adversely affect	Not applicable
California red-legged frog	<i>Rana draytonii</i>	FT	May affect, and is likely to adversely affect	Not applicable
Reptiles				
Alameda whipsnake	<i>Masticophis lateralis euryxanthus</i>	FT	May affect, and is likely to adversely affect	No adverse modification
Birds				
California least tern	<i>Sternula antillarum browni</i>	FE	No effect	Not applicable
Mammals				
salt-marsh harvest mouse	<i>Reithrodontomys raviventris</i>	FE	No effect	Not applicable
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE	No effect	Not applicable
Plants				
Contra Costa goldfields	<i>Lasthenia conjugens</i>	FE	No effect	Not applicable

*Federal Endangered (FE); Federal Threatened (FT)

California Tiger Salamander

Potential impacts to California tiger salamanders include 0.59 acre of permanent and 13.23 acres of temporary loss of upland dispersal, foraging, and refugia habitat, and habitat fragmentation (Table 2.3.5-2). Conversion of habitat from vegetated to developed would

result in a permanent loss of upland habitat. Ground disturbance activities from staging, clearing and grubbing, etc. could temporarily impact potential upland dispersal, foraging, and refugia habitat. California tiger salamanders aestivating in burrows may be crushed as a result of soil compaction from heavy equipment. The proposed modifications to California tiger salamander habitat may have a potential adverse impact on the behavioral patterns of some individuals of this species, including foraging, migration, and aestivation.

The project would not affect potential breeding habitat because no work would occur in Vallecitos Creek. Project activities are not expected to impact movement of California tiger salamanders between nearby breeding ponds, since the project would not create new barriers to potential movement of the species. Temporary impacts to four concrete- or riprap-lined ephemeral channels that are within range of suitable California tiger salamander habitat, off the shoulder of I-680 would not impact the species, as these features do not provide suitable aquatic dispersal, breeding, or foraging habitat. Therefore, no temporary or permanent impacts to aquatic habitat are anticipated.

California tiger salamander habitat in the project area would also serve as habitat for California red-legged frog and Alameda whipsnake; therefore, impacts to all three species are shown in Table 2.3.5-2. Depending on the availability of funding, the project could be constructed in phases (Section 1.4.1). Impact acreages are provided by phase and for the full Build Alternative.

Table 2.3.5-2: Impacts and Proposed Compensatory Mitigation for California Tiger Salamander, California Red-legged Frog, and Alameda Whipsnake Habitat

Habitat Type ^{1,3}	Permanent Impacts Phase 1 (Acres ²)	Permanent Impacts Phase 2 (Acres ²)	Permanent Impacts Full Build (Acres ²)	Temporary Impacts Phase 1 (Acres ²)	Temporary Impacts Phase 2 (Acres ²)	Temporary Impacts Full Build (Acres ²)	Mitigation for Permanent Impacts (3:1 Ratio)	Mitigation for Temporary Impacts (1:1 Ratio)	Total Mitigation for Project Impacts ⁴
Grassland	0.08	0.03	0.11	7.07	1.11	8.17	0.33	8.17	8.50
Forests and Woodlands	0.01	0.13	0.14	3.05	0.98	4.02	0.42	4.02	4.44
Scrubland	<0.01	0.04	0.04	0.08	0.18	0.25	0.12	0.25	0.37
Disturbed Vegetation (ruderal and landscaped)	0.01	0.29	0.30	0.05	0.72	0.77	0.90	0.77	1.67
Total	0.10	0.49	0.59	10.24	2.98	13.23	1.77	13.23	15.005

Notes:

1. Vegetation communities mapped based on their dominant species.
2. Acreages rounded to the nearest hundredth, so values shown for each vegetation type in table may not add up to total acreage shown.
3. California tiger salamander habitat in the project area would also serve as habitat for California red-legged frog and Alameda whipsnake; therefore, impacts to all three species are shown in.
4. Total mitigation is for the full Build Alternative. If compensatory mitigation is provided by phase, a 1:1 ratio for temporary impacts and a 3:1 ratio for permanent impacts would be applied.
5. Some mitigation will be completed through on-site restoration.

Implementation of the avoidance and minimization measures described in Section 2.3.5.4 would reduce any disturbance to individuals dispersing through or using small mammal burrows within the project footprint. Based on the direct impacts to upland dispersal, foraging, and refugia

habitat, as well as the potential for take of individual California tiger salamander to occur, the project “may affect, and is likely to adversely affect” California tiger salamander under FESA.

The project also has the potential to result in take of California tiger salamander as defined in CESA, which would include injury or mortality to individuals. A request for a Consistency Determination or Incidental Take Permit for California tiger salamander will be submitted to CDFW under Section 2080.1 of the CESA.

California Red-Legged Frog

Potential impacts to California red-legged frogs would include 0.59 acre of permanent and 13.23 acres of temporary loss of upland dispersal, foraging, and refugia habitat, and habitat fragmentation (Table 2.3.5-2). Conversion of habitat from vegetated to developed would result in a permanent loss of upland habitat. Ground disturbance activities from staging, clearing and grubbing, etc. could temporarily impact potential upland dispersal, foraging, and refugia habitat along I-680. The proposed modifications to California red-legged frog habitat may have a potential adverse impact on the behavioral patterns of some individuals of this species, including foraging, migration, and aestivation.

The project would not affect potential breeding habitat because no work would occur in Vallecitos Creek. Project activities are not expected to impact movement of California red legged frogs between nearby breeding ponds, since no new barriers to potential movement of the species are anticipated. The temporary impacts anticipated to four ephemeral drainages that fall within range of suitable California red-legged frog habitat off the shoulder of I-680 would not impact the species, as these features do not provide suitable aquatic dispersal, breeding, or foraging habitat. Therefore, no temporary or permanent impacts to aquatic habitat are anticipated.

Potential upland habitat for the species outside of the project footprint would be fenced off with ESA fencing and avoided. Implementation of the proposed avoidance and minimization measures mentioned above are expected to minimize potential effects to California red-legged frog.

Based on the direct impacts to upland dispersal habitat, foraging, and refugia habitat, there is potential for take of individual California red legged frogs to occur. Therefore, the project “may affect, and is likely to adversely affect” California red-legged frog under FESA.

Alameda Whipsnake

The project would not directly affect core habitat (i.e., scrub and chaparral) of the Alameda whipsnake. Potential impacts include 0.59 acre of permanent and 13.23 acres of temporary impacts to potential dispersal and foraging habitat (Table 2.3.5-2). The loss of potential species habitat would not be substantial given that core habitat (i.e., scrub and chaparral) would not be disturbed and grassland habitat is abundant in the region.

No indirect impacts to Alameda whipsnake are expected to occur. No impacts to designated critical habitat Unit 3 are anticipated. Proposed project activities adjacent to the critical habitat unit along I-680 would take place between the northbound and southbound lanes and would consist of construction of the proposed HOV/express lanes, maintenance vehicle pullouts, retaining walls, concrete barriers, and overhead signs in the median. Due to the consistently high level of traffic and the concrete median barrier on I-680, I-680 is considered a barrier to Alameda whipsnake movement, although the species may use culverts under I-680 to travel between the

east and west sides of the freeway. Therefore, the construction of an additional barrier is not expected to create a new impediment to movement or impact any suitable habitat. Caltrans does not anticipate an adverse modification to the adjacent critical habitat Unit 3.

There is a low potential that the Alameda whipsnake could pass through the project footprint because the species has been documented in the project vicinity, has been found in grassland habitats, and has designated critical habitat immediately adjacent to the BSA. In the event that the species is present during construction, construction-related activities could result in the loss or harm of individual Alameda whipsnakes. Therefore, the project “may affect, and is likely to adversely affect” Alameda whipsnake under FESA.

Take of Alameda whipsnake as defined in CESA would include injury or mortality to individuals. With the implementation of the avoidance and minimization measures in Section 2.3.5.4, no take of individuals under CESA is anticipated as a result of the project.

2.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

California Tiger Salamander

In addition to Measures BIO-1 (Section 2.3.1.3) and BIO-6 (Section 2.3.2.4), the following measures are proposed for California tiger salamander.

BIO-16. The following avoidance and minimization measures are proposed to avoid impacts to California tiger salamander:

- Where feasible, project activities in dispersal habitat will be timed to occur during the dry season (nonbreeding season for the California tiger salamander) (April 15 through October 15) to minimize potential effects to salamander breeding and dispersal.
- Portions of the project footprint that are suitable refuge habitats for the California tiger salamander (i.e., grasslands and other natural habitats within 1.24 miles of potential breeding sites) will be surveyed before initiating ground-disturbing activities to identify burrows or other potential sites (under materials that could provide cover such as boards, scrap metal, woody debris, or other materials) that might be occupied by this species. To the extent feasible, potentially occupied refugia burrows within the project footprint will be fenced and avoided for the duration of the activity at that location.
- Within 24 hours before initial ground-disturbing activities, portions of the project footprint where potential California tiger salamander habitat has been identified will be surveyed by an approved biologist(s) to clear the site of salamanders moving above-ground, or taking refuge in burrow openings or under materials that could provide cover such as boards, scrap metal, woody debris, or other materials.
- An approved biologist(s) will be present during initial ground-disturbing activities in suitable refugia habitats for the California tiger salamander to monitor the removal of the top 12 inches of topsoil at all project locations. If California tiger salamanders are discovered during the initial ground-disturbing activities, work will be stopped immediately and the biologist will contact CDFW and USFWS within one working day. The biologist in consultation with CDFW and USFWS will use adaptive management to modify as necessary project activities to avoid or minimize effects to listed species.

- If individual animals are observed, work at that location will be temporarily halted while the approved biologist(s) excavates the occupied burrow by hand, and the individual salamander is moved to a natural burrow within 0.25 mile of the construction site. CDFW will be notified if California tiger salamanders are found and relocated. Any listed amphibian will be released at the mouth of a suitable burrow and then observed until it has safely entered the burrow.
- All excavated, steep-walled holes or trenches more than 1 foot deep with walls steeper than 30 degrees should be covered with plywood or provided with an escape ramp of earth fill or wooden planks at the close of each working day. Before filling trenches or holes, the sites should be thoroughly inspected for listed species.
- An erosion and sediment control plan will be implemented to prevent impacts of construction on breeding, dispersal, and foraging habitat outside the work areas.

BIO-17. Caltrans proposes mitigation for California tiger salamander through on-site restoration of all temporarily impacted areas. Although the project will result in the temporary loss of potential dispersal, foraging, and refugia habitat, replanting with native erosion control species will result in improvements to California tiger salamander upland habitat within the temporarily disturbed areas of the project footprint.

Caltrans anticipates a need for off-site compensation for permanent impact areas. In order to mitigate for permanent direct effects to California tiger salamander under CESA, as well as for California red-legged frog and Alameda whipsnake, Caltrans proposes to purchase habitat credits at a 3:1 ratio from an approved mitigation bank such as Ohlone West Conservation Bank or Collier Canyon Mitigation and Conservation Bank (which is still in agency review). The purchase of multi-species bank credits may be used to satisfy the conditions of multiple agencies and jurisdictions including FESA, CESA, and the CEQA process. The final mitigation may be subject to change during the consultation and permitting processes.

To mitigate temporary impacts, Caltrans proposes to restore the habitat on-site. If it becomes evident after construction that it is not physically possible or appropriate to restore all temporary impacts acres on-site, Caltrans will purchase additional off-site mitigation.

California Red-Legged Frog

In addition to the general avoidance and minimizations measured outlined in Measures BIO-1 (Section 2.3.1.3) and BIO-6 (Section 2.3.2.4), the measures listed for California tiger salamander in BIO-16 and BIO-17 will also be implemented for California red-legged frog. The following measure will also be implemented for California red-legged frog:

BIO-18. Portions of the project footprint that are suitable refuge habitats for California red-legged frogs (i.e., grasslands and other natural habitats within 1 mile of potential breeding sites) will be surveyed before initiating ground-disturbing activities to identify burrows or other potential sites that might be occupied by this species. To the extent feasible, potentially occupied refugia within the project footprint will be fenced and avoided for the duration of the activity at that location.

Alameda Whipsnake

The project would only permanently impact roadside ruderal and grassland habitats, thus limiting the loss of potential movement habitat for the species. The project does not include the disturbance of any core habitat (i.e., scrub/chaparral habitat) and would not create a barrier to movement by the species. The measures discussed above for the California tiger salamander and California red-legged frog, respectively, in addition to the general measures discussed in Sections 2.3.1.3 and 2.3.2.4 are applicable to the Alameda whipsnake.

2.3.6 Invasive Species

2.3.6.1 Regulatory Setting

On February 3, 1999, President William J. Clinton signed EO 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” FHWA guidance issued August 10, 1999 directs the use of the State’s invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the NEPA analysis for a proposed project.

2.3.6.2 Affected Environment

This section is summarized from the *Natural Environment Study* (AECOM 2019d) for the proposed project, which was completed in August 2019.

The BSA supports a number of nonnative species, some of which are exotic but not invasive, including a variety of ornamental species trees that were planted along the roadway such as intermittent stands of nonnative blue gum eucalyptus that were planted along I-680. Some are both exotic and invasive. Invasive species in the BSA include nonnatives that are deemed high risk by the California Invasive Plant Council. These include red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), yellow star thistle, Himalayan blackberry, and sweet fennel. Yellow star thistle and sweet fennel are particularly pervasive on the hillsides of the BSA.

2.3.6.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not introduce invasive species into the project area.

Build Alternative

None of the identified species on the California list of noxious weeds is used by Caltrans for erosion control or landscaping. However, project construction activities have the potential to inadvertently spread these species.

No additional effects would result from phased construction of the Build Alternative (described in Section 1.4.1).

2.3.6.4 Avoidance, Minimization, and/or Mitigation Measures

BIO-19. In compliance with the EO on Invasive Species, EO 13112, and guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will not use species listed as invasive. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

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.

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 NEPA can be found in 40 CFR, Section 1508.7.

2.4.2 Cumulative Impact Analysis

This cumulative impact analysis determines whether the Build Alternative in combination with other past, present, or reasonably foreseeable projects would result in a cumulative effect, and, if so, whether the Build Alternative's contribution to the cumulative impact would be considerable. Past, present, and reasonably foreseeable future projects include land use developments, infrastructure, and other transportation improvements that are planned and funded and would be located near the proposed Build Alternative improvements. The projects included in the cumulative impact analysis are described in Table 2.4.2-1.

The No Build Alternative would not include improvements to I-680. It would not require construction except from routine maintenance and would not contribute to cumulative environmental effects in combination with other projects.

Table 2.4.2-1: Projects Considered for Cumulative Impacts Analysis

Project Proponent/Name	Project Description	Project Status	Location (Approximate Distance from Project Area)
Transportation			
Caltrans/SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (EA 297631)	The project will widen and conform SR 84 to expressway standards between south of Ruby Hill Drive and I-680, improve SR 84/I-680 interchange ramps, and extend the existing southbound I-680 HOV/express lane northward by approximately 2 miles, to approximately 0.8 mile north of Koopman Road.	Future project; construction anticipated in late 2020 through 2023.	I-680 (within project area)
Caltrans/I-680 Roadway Rehabilitation Project (EA 0J620)	The project will resurface and restore the I-680 mainline and ramps; replace approach slabs; repair or replace drainage systems, including culverts, downdrains, inlets, curbs, edge drains, dikes, and slope correction; replace or upgrade metal beam guardrails, concrete barriers, guardrail-bridge connections, and end treatments. The project will also include replacing loop detectors, upgrading roadway signs, raising overhead sign structures, installing shoulder backing material, and implementing Americans with Disabilities Act requirements as needed.	Future project; construction anticipated in 2020.	I-680 (within project area)
Caltrans/I-680/Sunol Boulevard Interchange Improvements Project (EA 0Q920)	The project will modify intersection traffic control and geometry along Sunol Boulevard in the vicinity of the interchange, widen the southbound I-680 on-ramp from Sunol Boulevard, and construct pedestrian and bicycle improvements along Sunol Boulevard. The project would increase vehicle storage, modify lane striping on the ramps and adjacent streets, and improve pedestrian and bicycle facilities in the interchange area.	Future project; construction anticipated in 2024.	I-680 (within project area)
Caltrans/I-680 HOV Lane + Sunol Express Lanes - Southbound	This project included construction of an HOV lane (later converted to an express lane) from SR 84 to SR 237 with auxiliary lanes and ramp metering facilities.	Past project; completed in 2010.	I-680 (within project area)
Caltrans/I-680 Sunol Express Lanes – Northbound (EA 4G050)	The project will construct an HOV/Express lane on northbound I-680 from south of SR 237 in Santa Clara County to north of SR 84 in Alameda County.	In construction; to be completed in late 2020.	I-680, from Calaveras Road (SR 237) to SR 84 (within project area)
Caltrans/Arroyo de la Laguna Bridge Scour Project	The project proposes to mitigate bridge scour, provide the bridge's structural integrity by providing seismic improvements, and improve safety.	Future project; construction is anticipated early 2021.	SR 84, in the town of Sunol (0.6 mile west of I-680)
Infrastructure			
Alameda County Fire Department/Sunol Fire Department Project	Alameda County Fire Department proposes to build a fire station in Sunol on Paloma Way approximately 0.5 mile west of I-680. The project includes a pre-fabricated 2,000 square-foot fire station and a 2,500 square-foot garage adjacent to the main building.	Proposed project.	SR 84 (Paloma Way) (0.5 mile west of I-680)

2.4.3 Resource Areas with No Contribution to Cumulative Effects

The cumulative effects analysis follows the Caltrans Eight Step Guidance for identifying and assessing cumulative impacts (Caltrans 2016d). For resource areas that would have no adverse effects from the proposed project, no incremental effects would be cumulatively considerable. Therefore, no cumulative effects are anticipated for the following resource areas:

- Existing and Future Land Use (Section 2.1.1)
- Consistency with State, Regional and Local Plans and Programs (Section 2.1.2)
- Park and Recreation Facilities (Section 2.1.3)
- Growth (Section 2.1.4)
- Environmental Justice (Section 2.1.5)
- Utilities/Emergency Services (Section 2.1.6)
- Traffic (Section 2.1.7)
- Cultural Resources (Section 2.1.9)
- Hydrology and Floodplain (Section 2.2.1)
- Water Quality and Storm Water Runoff (Section 2.2.2)
- Paleontology (Section 2.2.3)
- Hazardous Waste/Materials (Section 2.2.4)
- Air Quality (Section 2.2.5)
- Noise (Section 2.2.6)
- Invasive Species (Section 2.3.6)

In addition, no cumulative effects are anticipated for the following biological resources:

- Migratory corridors (Section 2.3.1)
- Fish passage (Section 2.3.1)
- Wetlands and other waters of the U.S. (Section 2.3.2)
- Plant species (Section 2.3.3)
- Animal species (Section 2.3.4)

The amount and quality of these species' habitat potentially affected by the proposed project would not affect local populations. Project avoidance and minimization measures listed in Section 2.3 will avoid or reduce effects to these species during project construction. Furthermore, potential effects to habitat for many of these species would be offset through on-site restoration and enhancement activities described in Section 2.3. As a result, impacts to these species as a result of the proposed project are anticipated to be minimal and would not result in incremental effects that would be cumulatively considerable.

2.4.4 Resources Considered for Contribution to Cumulative Effects

2.4.4.1 Visual/Aesthetics

The project would affect visual/aesthetic resources on I-680. I-680 in the project limits is an Officially Designated State Scenic Highway, offering distant views of Mount Hamilton, Mission Peak, the Maguire Peaks, and the Pleasanton and Apperson Ridges to the south and Mount Diablo to the north. The project would introduce new visual elements on I-680 including HOV/express lane signs, trestle gantries, and lights; additional pavement along the median and outside edges for the new HOV/express lanes; new retaining walls and sound walls; and widened bridges at the existing Pleasanton Sunol Road, Dublin Boulevard, and Amador Valley Boulevard undercrossings. The project would remove trees (approximately 1,052, consisting of 510 natives and 542 nonnatives¹⁶) and other vegetation within the state ROW. The project would also add features that would not adversely affect views, such as equipment cabinets, grassy biofiltration areas, maintenance vehicle pullouts, CHP enforcement areas, and concrete barriers. Therefore, visual/aesthetic resources are considered for the cumulative effects analysis.

The resource study area (RSA) for the visual/aesthetics analysis is the same as the analysis area noted in Section 2.1.8 and is the area of land that is visible from, adjacent to, and outside of the I-680 right-of-way, and is determined by topography, vegetation, and viewing distance. This area was chosen because it encompasses both the views from the project area as well as views of the project area from nearby residents and businesses.

I-680 in the project area crosses through a natural transportation corridor dating to prehistoric times. By 1957, Foothill Road was the main interior north-south road in Alameda County, connecting the San Ramon Valley to Mission San Jose, while the Stockton Road (later I-580) connected Oakland to the San Joaquin Valley. Construction of I-680 in the project area began in 1962 and was completed in 1967. At the same time, former SR 50 was widened to form I-580 (Archaeological/Historical Consultants 2020c). The SR 84/I-680 interchange was constructed in the late 1960s, and conversion of SR 84 between I-580 and I-680 into a four-to six-lane expressway began in 2003 and is still underway. Despite the addition of roadways and other development in the project area, many locations in the RSA, particularly south of Sunol Boulevard, have views of hills and ridges to the east and west of I-680, as well as vegetation at the edges of the highway including mature trees, screening vegetation, and grassy hillsides. Mountains and ridges to the north and south are visible in the distance through the I-680 corridor, including in the more urbanized areas north of Sunol Boulevard. These factors demonstrate a historic stability in the health of visual/aesthetic resources in the project area.

Further contributing to the health of visual/aesthetic resources in the Alameda County portion of the RSA was the passage of Alameda County Measure D in 2000 (discussed in Section 2.1.2.1). Measure D amended the Alameda County General Plan and the regionally specific East County Area Plan to restrict development through detailed land and site planning requirements that discourage contemporary sprawl development. The East County Area Plan area applies to all unincorporated areas of the county that do not fall within the general plan boundaries of Dublin,

¹⁶ Section 2.3.1.2 states that a total of 821 trees may be permanently impacted (removed or heavily pruned [over 30 percent of the canopy removed]), and 231 trees may be temporarily impacted (compaction of root zone or minor pruning) by project activities. To be conservative, this analysis assumes that all permanently and temporarily impacted trees, totaling 1,052, would be removed.

Livermore, Pleasanton, and a portion of Hayward. Although the majority of the project limits fall within the general plan boundaries of Pleasanton and Dublin, Measure D helps to protect the scenic quality of the RSA by preserving open space surrounding it.

The northernmost approximately 1 mile of the project is in San Ramon, which is in Contra Costa County. Contra Costa County Measure L (2006) extended the term of previous ballot measures that set an urban limit line for the county, limited urban development to no more than 35 percent of county land, and required that at least 65 percent be preserved for agriculture, open space, wetlands, parks, and other non-urban uses (Contra Costa County 2006). By preserving open space surrounding the RSA, Measure L also helps to protect the health of visual/aesthetic resources.

The development projects described in Section 2.1.1.1 are subject to the land use requirements that apply to their jurisdictions, which include plan policies and ordinances that reflect the aesthetic values and priorities for each city and community along the project corridor. As such, the projects would not conflict with Measure D, Measure L, the East County Area Plan, or the applicable city general plans, and are not expected to contribute to cumulative visual/aesthetic impacts in the RSA.

The following past, present, or reasonably foreseeable transportation projects in the area had or have the potential to affect visual/aesthetic resources.

- The SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project would introduce new visual elements on SR 84 and I-680 including additional pavement, bridge widening, a new flyover ramp, retaining walls, signage, and lighting. On I-680, the project would extend the existing southbound HOV/express lane from approximately Calaveras Road to approximately 0.8 mile north of Koopman Road, a distance of approximately 2 miles. VTMS signs, other HOV/express lane signs, and sign lighting would be constructed as far north as approximately Verona Road. The project would also remove vegetation that currently serves as visual screening, primarily along SR 84. Replacement planting is included where space permits, and aesthetic treatments are proposed for new project elements such as retaining walls. The replacement planting includes trees along I-680 to provide screening of HOV/express lane signs and lighting for residents on the west side of I-680, and replacement trees for biological mitigation at ratios to be determined in consultation with CDFW.
- The I-680 Roadway Rehabilitation Project is anticipated to upgrade roadway signs and potentially raise existing overhead sign structures to meet current Caltrans standards.
- The I-680/Sunol Boulevard Interchange Improvements Project would modify intersection traffic control and geometry along Sunol Boulevard at I-680, widen the southbound I-680 on-ramp, and construct pedestrian and bicycle improvements along Sunol Boulevard.
- The I-680 HOV Lane & Sunol Express Lanes - Southbound Project resulted in vegetation removal, new retaining walls, and express lane signage and lighting. Replacement vegetation was planted where space permitted.
- The I-680 Sunol Express Lanes - Northbound Project resulted in vegetation removal and new HOV/express lane signage and lighting. Replacement vegetation was planted where

space permitted, and aesthetic treatments were included for new project elements such as retaining walls.

By removing existing vegetation, increasing pavement and other hard surfaces, and placing additional signs along I-680 in the RSA, each past, present, and reasonably foreseeable project would contribute incrementally to cumulative impacts to visual/aesthetic resources along this Officially Designated State Scenic Highway. The projects include mitigation and restoration measures that would help protect the health of the resource. These measures serve to reduce impacts, but some impacts will remain with each successive project in the RSA.

As described in Section 2.1.8.3, the proposed project would result in an overall moderate change to visual resources and moderate visual impacts. The project would remove existing vegetation, increase pavement and other hard surfaces, and place additional signs along I-680 in the RSA. Preserving vegetation where feasible and replanting removed landscaping would reduce the project's construction impacts (see Measures VIS-1 through VIS-3 in Section 2.1.8.4). On-site tree replanting at the typical mitigation ratios (see Measure BIO-4 in Section 2.3.1.3) would result in a net increase in trees, and aesthetic treatments would reduce impacts from hard surfaces such as concrete barriers and retaining walls (see Measure VIS-4 in Section 2.1.8.4). Some overhead signs or sign panels that would be installed by the SR 84 Expressway Widening Project and the I-680 Sunol Express Lanes - Northbound Project would be replaced or removed by the proposed project, to avoid redundancy, reduce visual clutter, and meet Caltrans spacing standards for HOV/express lanes signage. The proposed measures listed in Section 2.1.8.4 and adherence to Caltrans standard design requirements would reduce but not fully eliminate the visual impacts of the proposed project.

While the proposed project would contribute incrementally to cumulative visual/aesthetic impacts in the RSA, the impacts would not represent a contribution that is cumulatively considerable.

2.4.4.2 Natural Communities

Oak Woodlands

Coast live oak woodland, valley oak woodland, and mixed oak woodland all occur within the BSA. These communities provide habitat for many special-status species. Coast live oak woodland occurs in patches throughout the BSA, often found in the depressions between hills. Valley oak woodland occurs in several places in the BSA, typically at higher elevations than coast live oak woodland, on high riparian terraces and mesic meadows with little other tree competition. Mixed oak woodland is present throughout the BSA, in forest stands where several oak species are dominant in the canopy. Because of its limited current distribution due to clearing for pasture and agricultural land, valley oak woodland is considered a sensitive vegetation community by CDFW.

Several past, present, or reasonably foreseeable transportation and infrastructure projects in the area had or have the potential to affect oak woodlands.

- The SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project is anticipated to have would have approximately 2.23 acres of permanent impacts and 2.32 acres of temporary impacts to coast live oak woodland, valley oak woodland, mixed oak

woodland, and riparian woodland. If enough space is not available for on-site mitigation, replacement off-site mitigation will be provided at Collier Creek Preserve. In addition, the project is anticipated to remove 33 oaks (valley oak and coast live oak) and temporarily affect 199 trees in riparian woodland and scrub habitat (including 39 valley oaks and 103 coast live oaks). Tree replanting and mitigation ratios will be determined in consultation with CDFW.

- The I-680 Roadway Rehabilitation Project is estimated to have 0.12 acre (permanent) and 0.73 acre (temporary) impacts to coast live oak woodland habitat. Tree replanting and mitigation ratios will be determined in consultation with CDFW.
- The I-680 HOV Lane & Sunol Express Lanes - Southbound Project resulted in the removal of 157 mature and submature coast live oak, valley oak, northern California black walnut, California bay, and California buckeye trees. Tree replanting and mitigation ratios were determined in consultation with CDFW.
- The I-680 Sunol Express Lanes - Northbound Project had 0.06 acre of permanent impacts and 0.13 acre of temporary impacts, along with removal of seven coast live oaks and two eucalyptus. Mitigation will be provided at Collier Creek Preserve, including replacement of the removed trees at a 5:1 ratio.

No information was available about effects to oak woodlands from the I-680/Sunol Boulevard Interchange Improvements Project, Arroyo de la Laguna Bridge Scour Project, or the Sunol Fire Department Project.

The past, present, and reasonably foreseeable projects with the potential to affect oak woodlands include mitigation and restoration that would protect the health of the resource. The proposed project would require removal of some oak woodland vegetation. The amount and quality of vegetation being affected would be mitigated through restoration at a minimum ratio of 3:1 for oak trees, and 1:1 for other species in upland areas (see Measures BIO-1 through BIO-4 in Section 2.3.1.3). Therefore, impacts to oak woodlands as a result of the proposed project are anticipated to be minimal and would not result in incremental effects that would be cumulatively considerable.

2.4.4.3 Threatened and Endangered Species

The proposed project “may affect, and is likely to adversely affect” three threatened and endangered species under the FESA. Therefore, they are considered for cumulatively considerable effects.

California Tiger Salamander

Potential impacts to California tiger salamanders include 0.59 acre of permanent and 13.23 acres of temporary loss of upland dispersal, foraging, and refugia habitat. The resource study area for the resource includes the BSA and a 1.24-mile buffer. The distance was determined in accordance with the *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (USFWS 2003), which recommends reviewing habitat within 1.24 miles of project boundaries based on the observed mobility of the species. Section 2.3.5.2 provides information about the resource health for this species.

The following past, present, or reasonably foreseeable transportation and infrastructure projects in the area had or have the potential to affect California tiger salamanders.

- The SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project was anticipated to have 38.57 acres of permanent and 30.86 acres of temporary loss of upland dispersal, foraging, and refugia habitat, and habitat fragmentation. In addition, potential impacts include 0.03 acre of permanent and 0.10 acre of temporary impacts to aquatic nonbreeding dispersal and foraging habitat, and 0.15 acre of permanent and 0.08 acre of temporary impacts to suitable aquatic breeding habitat. Caltrans proposes to purchase a total of approximately 148 acres of habitat from Ohlone West Conservation Bank and Collier Creek Preserve to mitigate for permanent direct effects to California tiger salamander at a 3:1 ratio. If credits are not available, Caltrans will purchase credits at another nearby facility, or purchase and conserve habitat to address the species' requirements. To mitigate the 31.04 acres of temporary impacts (1:1 ratio), Caltrans proposes to restore the habitat on-site. If it becomes evident after construction that it is not physically possible or appropriate to restore all 31.04 acres on-site, Caltrans will investigate other options such as enhancing existing habitat or purchasing additional off-site mitigation.
- The I-680 Roadway Rehabilitation Project is estimated to have 0.14 acre (permanent) and 2.43 acres (temporary) of impacts to California tiger salamander habitat. Caltrans proposes 0.42 acre of off-site compensation for permanent impacts (3:1 ratio) and on-site restoration of the 2.43 acres of temporarily impacts (1:1 ratio).
- The I-680 Sunol Express Lanes – Northbound Project resulted in permanent impacts to 6.82 acres and temporary impacts to 8.05 acres of California tiger salamander habitat. Compensatory mitigation will be provided through the purchase of 29.08 acres of multi-species habitat credits that include California tiger salamander at the Ohlone West Conservation Bank.
- The Sunol Fire Department Project was expected to permanently impact 2 to 3 acres of habitat. Effects were planned to be mitigated through land set aside with easements or mitigation bank credits.

The following projects did not or would not have an effect to California tiger salamander, or no information about impacts was available: I-680/Sunol Boulevard Interchange Improvements Project, I-680 HOV Lane & Sunol Express Lanes Southbound, and Arroyo de la Laguna Bridge Scour Project.

The past, present, and reasonably foreseeable projects with the potential to affect California tiger salamander include mitigations that would protect the health of the resource. The proposed project would require removal of some California tiger salamander upland dispersal, foraging, and refugia habitat. The amount and quality of habitat being affected would be mitigated through restoration at a ratio of 1:1 for temporary effects and 3:1 for permanent effects, either on-site through the enhancement or restoration of grasslands and woodlands that provide suitable upland habitat, or through the purchase of credits at an approved mitigation bank. Replanting of native erosion control species is anticipated to improve upland habitat. These and other measures are discussed in Section 2.4.4.3. As a result, impacts to California tiger salamander as a result of the

proposed project are anticipated to be minimal and would not result in incremental effects that would be cumulatively considerable.

California Red-Legged Frog

Potential project impacts to California red-legged frogs include 0.59 acre of permanent and 13.23 acres of temporary loss of upland dispersal, foraging, and refugia habitat. The resource study area for this resource is the same as the California tiger salamander, since it encompasses the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005) recommended 1-mile buffer. Section 2.3.5.2 provides information about the resource health for this species.

The following past, present, or reasonably foreseeable transportation and infrastructure projects in the area had or have the potential to affect California red-legged frog.

- The SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project is anticipated to result in 38.57 acres of permanent and 30.86 acres of temporary loss of upland dispersal, foraging, and refugia habitat, and habitat fragmentation. In addition, potential impacts include 0.03 acre of permanent and 0.10 acre of temporary impacts to aquatic nonbreeding dispersal and foraging habitat, and 0.15 acre of permanent and 0.08 acre of temporary impacts to suitable aquatic breeding habitat. Caltrans proposes to purchase a total of approximately 148 acres of habitat from Ohlone West Conservation Bank and Collier Creek Preserve to mitigate for permanent direct effects to California red-legged frog at a 3:1 ratio. If credits are not available, Caltrans will purchase credits at another nearby facility, or purchase and conserve habitat to address the species' requirements. To mitigate the 31.04 acres of temporary impacts (1:1 ratio), Caltrans proposes to restore the habitat on-site. If it becomes evident after construction that it is not physically possible or appropriate to restore all 31.04 acres on-site, Caltrans will investigate other options such as enhancing existing habitat or purchasing additional off-site mitigation.
- The I-680 Roadway Rehabilitation Project is estimated to have 0.14 acre (permanent) and 2.43 acres (temporary) of impact to California red-legged frog habitat. Caltrans proposes 0.42 acre of off-site compensation for permanent impacts (3:1 ratio) and on-site restoration of the 2.43 acres of temporarily impacts (1:1 ratio).
- The I-680 Sunol Express Lanes - Northbound Project resulted in permanent impacts to 6.82 acres and temporary impacts to 8.05 acres of California red-legged frog habitat. Compensatory mitigation will be provided through the purchase of 29.08 acres of multi-species habitat credits that include California red-legged frog at the Ohlone West Conservation Bank.
- The Sunol Fire Department Project was expected to permanently impact 2 to 3 acres of habitat. Effects were planned to be mitigated through land set aside with easements or mitigation bank credits.

The following projects did not or would not affect California red-legged frog, or no information on impacts or mitigation was available: I-680/Sunol Boulevard Interchange Improvements

Project, I-680 HOV Lane & Sunol Express Lanes-Southbound, and Arroyo de la Laguna Bridge Scour Project.

The past, present, and reasonably foreseeable projects with the potential to affect California red-legged frog include mitigations that would protect the health of the resource. The proposed project would require removal of some California red-legged frog upland dispersal, foraging, and refugia habitat. However, it is not anticipated that the project activities would impact the longevity and continued existence of the species. The amount and quality of habitat being affected would be mitigated through restoration at a ratio of 1:1 for temporary effects and 3:1 for permanent effects. Replanting of native erosion control species is anticipated to improve upland habitat. These and other measures are discussed in Section 2.4.4.3. As a result, impacts to California red-legged frog or its designated habitat as a result of the proposed project are anticipated to be minimal and would not result in incremental effects that would be cumulatively considerable.

Alameda Whipsnake

Potential impacts to Alameda whipsnake include 0.59 acre of permanent and 13.23 acres of temporary loss of upland dispersal and foraging habitat. No impacts to designated critical habitat Unit 3 are anticipated. The resource study area for the resource includes the BSA with a 2-mile buffer. This distance provides a reasonable study boundary that balances the typical species dispersal range of 1,640 feet from scrub habitat with the maximum dispersal range of 4 miles (USFWS 2011b). Section 2.3.5.2 provides information about the resource health for this species.

The following past, present, or reasonably foreseeable transportation and infrastructure projects in the area had or have the potential to affect Alameda whipsnake.

- The SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project is anticipated to have 16.67 acres of permanent and 18.42 acres of temporary impacts on potential dispersal and foraging habitat for Alameda whipsnake. Caltrans proposes to purchase 70 acres of habitat from Ohlone West Conservation Bank to mitigate for permanent direct effects to Alameda whipsnake at a 3:1 ratio. If credits are not available, Caltrans will purchase credits at another nearby facility, or purchase and conserve habitat to address the species' requirements. To mitigate the 18.42 acres of temporary impacts (1:1 ratio), Caltrans proposes to restore the habitat on-site.
- The I-680 Roadway Rehabilitation Project is estimated to have 0.14 acre of permanent and 2.43 acres of temporary impacts to Alameda whipsnake habitat. Caltrans proposes 0.42 acre of off-site compensation for permanent impacts (3:1 ratio) and on-site restoration of the 2.43 acres of temporary impacts (1:1 ratio).
- I-680 Sunol Express Lanes – Northbound Project would result in permanent impacts to 12.91 acres and temporary impacts to 12.06 acres of Alameda whipsnake habitat. Compensatory mitigation will be provided through the purchase of multispecies habitat credits that include Alameda whipsnake at the Ohlone West Conservation Bank.

The following projects did not or would not have an impact to Alameda whipsnake, or no impact or mitigation information was available: I-680/Sunol Boulevard Interchange Improvements

Project, I-680 HOV Lane & Sunol Express Lanes-Southbound, Arroyo de la Laguna Bridge Scour Project, and Sunol Fire Department Project.

The past, present, and reasonably foreseeable projects with the potential to affect Alameda whipsnake include mitigations that would protect the health of the resource. Impacts to low-quality Alameda whipsnake habitat are considered negligible. For the proposed project, in order to mitigate for permanent direct effects to Alameda whipsnake, Caltrans proposes to purchase habitat credits from an approved mitigation bank such as Ohlone West Conservation Bank. These and other measures are discussed in Section 2.4.4.3. As a result, impacts to Alameda whipsnake or its designated critical habitat as a result of the proposed project are anticipated to be minimal and would not result in incremental effects that would be cumulatively considerable.

Chapter 3 California Environmental Quality Act Evaluation

3.1 Determining Significance under CEQA

The proposed project is a joint project by Caltrans and the FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and the NEPA. FHWA's responsibility for environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016, and executed by FHWA and Caltrans. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of "mandatory findings of significance," which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

3.2 CEQA Environmental Checklist

This checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects will indicate that there are no impacts to a particular resource. A NO IMPACT answer in the last column reflects this determination. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project, and standardized measures that are applied to all or most Caltrans projects such as BMPs and measures included in the Standard Plans and Specifications or as Standard Special Provisions, are considered to be an integral part of the project and have been considered prior to any significance determinations documented below; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 in order to

provide the reader with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2. This checklist incorporates by reference the information contained in Chapters 1 and 2.

AESTHETICS

Except as provided in Public Resources Code Section 21099, would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	-	-	X	-
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	-	-	X	-
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	-	-	X	-
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	-	-	X	-

- a) Less Than Significant Impact. Scenic vistas in the project area include mountains, ridges, and rural landscapes along and visible from I-680, an Officially Designated State Scenic Highway. Scenic vistas include Mount Hamilton, Mission Peak, and the Maguire Peaks to the south and Mount Diablo to the north. The Pleasanton and Apperson ridges are also visible to the south of SR 84. Scenic vistas to the east and west are available to varying degrees depending on travel speed and congestion.

Views of scenic vistas would be altered to varying degrees by project features including the addition of HOV/express lane signs, trestle gantries, and lights in the median of I-680; the addition of pavement toward the median and outside edges for the additional HOV/express lanes; the removal of vegetation to accommodate highway widening; the widening of existing bridges; and the addition of retaining walls and sound walls. Other features would be added by the project that would not affect views of scenic vistas, such as equipment cabinets, grassy biofiltration areas, maintenance vehicle pullouts, CHP enforcement areas, and concrete barriers.

The majority of the overhead signs, trestle gantries, and lights would be in the median of I-680. During the day, these project elements would be visible in the foreground of motorists' views of mountains, ridges, and rural landscapes. Views of the project features would be short in duration for motorists moving at freeway speeds. Existing views of areas outside of the freeway corridor would not be substantially impaired or blocked for motorists. During the night, when views of the mountains, ridges, and

rural landscapes are less visible, the overhead signs, trestle gantries, and lights would not substantially conflict with or obstruct motorists' views.

I-680 in the project limits has existing overhead signs, trestle gantries, and lights. The proposed static and VTMS signs, trestle gantries, and lighting would be consistent with the visual context of the existing freeway setting and with existing signs along I-680 to the north and south of the project corridor. The project would not have a substantial adverse effect on a scenic vista, and the impact would be less than significant.

- b) **Less Than Significant Impact.** The project is anticipated to require removal of approximately 1,052 trees (510 natives and 542 nonnatives) in the ROW to accommodate roadway widening, biofiltration swales, and other project features. Trees and other vegetation would be replaced as discussed in Measures VIS-1 through VIS-3 in Section 2.1.8.4 and Measures BIO-3 and BIO-4 in Section 2.3.1.3. . As stated in Measure BIO-4, final tree replanting and mitigation ratios will be determined in consultation with CDFW; however, native species within riparian areas and coast live oaks and valley oaks in oak woodlands are typically replaced at a 3:1 ratio, and other tree species are typically replaced at a minimum 1:1 ratio. The project would not damage rock outcroppings or historic buildings.

The discussion of impacts to scenic vistas in Item a, above, would apply to scenic resources within a state scenic highway. The new HOV/express lane signs that the project would add to I-680 in the project limits are standard throughout the San Francisco Bay Area, with overhead roadway signs currently installed or under construction on I-680 to both the north and south of the project area and on I-580 to the east.

On I-680 from Paloma Way to Sunol Boulevard (Landscape Unit A; see Section 2.1.8.3) in particular, the proposed overhead signs would block or overlap portions of motorists' views of distant scenic resources. The section of I-680 south of Sunol Boulevard has curves and elevation changes that would shield long-duration views of project signs from motorists. Intrusion on views would be short in duration for motorists passing each sign, and the signs would not completely obstruct views of the surrounding and distant hills and landforms. For motorists, the repeated visual intrusion caused by the proposed HOV/express lane signs may affect but would not substantially damage views of distant scenic resources.

For residents and other highway neighbors, the proposed VTMS signs and other overhead signs, trestle gantries, sign lights, and toll readers could be visible in views of scenic resources. Viewer sensitivity and response would depend on the proximity, elevation, viewing angle, and screening from trees, sound walls, or intervening structures in relation to the project features. The overall look and feel of the VTMS signs and other project features would be in character with existing highway signage and unified with the I-680 corridor. Where project features are visible to residents and other highway neighbors, views of those features may affect but would not substantially damage views of scenic resources. As noted in Section 2.1.8.3, the

locations of the project features adjacent to Key Views 2, 4, and 6 would be adjusted to avoid or minimize impacts, and implementation of Measure VIS-7 would further reduce visual impacts to residents.

Views of the dark night sky are also considered a scenic resource. Project elements that could add nighttime light and glare are discussed in Section 2.1.8.3. Illuminated overhead signs and other highway lighting are present throughout the project limits, along with transient illumination from moving vehicles. From Sunol Boulevard to Alcosta Boulevard (Landscape Units B and C, described in Section 2.1.8.3), street lighting and illuminated signs are prevalent throughout the residential and commercial areas along I-680.

The project would add sources of potential light and glare in the form of overhead signs that would reflect oncoming vehicle headlights, sign lighting to illuminate the sign surfaces and freeway pavement below, and amber-colored changeable messages on the VTMS signs. Light and glare could be visible to neighboring properties depending on their proximity, elevation, viewing angle, and screening from trees, sound walls, or intervening structures in relation to the overhead signs and sign lights. As described in Section 1.4.1.1, the brightness of changeable messages on VTMS signs is adjusted based on ambient light levels to avoid excessive light and glare, and safety lighting will be shielded by visors to avoid light spillover and glare in locations where residential areas or other sensitive resources are adjacent to I-680. The reflection of vehicle headlights on sign surfaces would be primarily visible to motorists approaching the signs. Nighttime light and glare from the project is not anticipated to substantially damage views of the night sky outside of the I-680 corridor.

Replacement planting would be provided and retaining walls and other structures would be given aesthetic treatments to reduce visual impacts, as described in Measures VIS-1 through VIS-4 in Section 2.1.8.4.

- c) – d) Less Than Significant Impact. See Items a and b, above.

AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	-	-	-	X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	-	-	-	X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	-	-	-	X
d) Result in the loss of forest land or conversion of forest land to nonforest use?	-	-	-	X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use or conversion of forest land to nonforest use?	-	-	-	X

- a) No Impact. Land uses adjacent to the project area include nonprime agricultural land; however, the project would stay within the state ROW and therefore would not convert Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance to nonagricultural use.
- b) No Impact. Land uses adjacent to the project area include lands under Williamson Act contract; however, the project would stay within the state ROW and no lands would be converted from their existing land use designations.
- c) No Impact. No forest land or timberlands exist in or adjacent to the project area; therefore, the project would not conflict with existing zoning for forest land or timberland.
- d) No Impact. No forest lands exist in or adjacent to the project area; therefore, forest lands would not be affected by the project.

- e) No Impact. The project would stay within the state ROW and would not convert any farmland, or make other changes that could result in the conversion of farmland.

AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	-	-	X	-
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard?	-	-	X	-
c) Expose sensitive receptors to substantial pollutant concentrations?	-	-	-	X
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	-	-	-	X

- a) Less Than Significant Impact. The project is included in the current RTP, *Plan Bay Area 2040* (MTC and ABAG 2017a, amended 2020, RTP ID 17-10-0065). The project is also included in the MTC's financially constrained 2019 TIP (MTC 2018, TIP ID ALA170009). The project's design concept, scope, and open-to-traffic date assumptions are generally consistent with the RTP and TIP. The Build Alternative would not interfere with the timely implementation of the transportation plans.
- b) Less Than Significant Impact. The Build Alternative would not interfere with the control measures described in the 2017 Clean Air Plan to plan for and achieve compliance with the federal and state ozone standards, increase criteria pollutants or MSATs over existing conditions, or exceed the BAAQMD's recommended thresholds for construction emissions (Section 2.2.5.3). Therefore, the Build Alternative would not cause or contribute to any state or federal air quality violations for criteria air pollutants.
- c) No Impact. The Build Alternative would not exceed increase criteria pollutants or MSATs over existing conditions, or exceed the BAAQMD's recommended thresholds for construction emissions (Section 2.2.5.3); therefore, the Build Alternative would not expose sensitive receptors to substantial pollutant concentrations. Standard measures to minimize construction-related air quality effects are included in Section 2.2.5.3.
- d) No Impact. The project would not introduce odors that are not already associated with existing traffic.

BIOLOGICAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, or U.S. Fish and Wildlife Service, or NOAA Fisheries?	-	X	-	-
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	-	X	-	-
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	-	X	-	-
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	-	-	X	-
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	-	-	X	-
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	-	-	-	X

- a) **Less Than Significant Impact with Mitigation Incorporated.** The Build Alternative has the potential to result in direct and indirect impacts on special-status plant and animal species, including CESA- and FESA-listed species and their habitats. The species, impacts, and avoidance, minimization, and/or mitigation measures are summarized below and described in detail in Section 2.3.

Special-status plants (Congdon's tarplant, stinkbells, Diablo helianthella, and bristly leptosiphon) have a low potential to occur in the project area and were not observed during surveys; however, not all project areas with suitable habitat were revisited during each round of surveys, and surveys did not coincide with blooming periods for all four species. The proposed project would result in the permanent loss of grassland and woodland habitat that could support these plant species. The project would have permanent impacts to 0.13 acre of California annual grassland, 7.01 acres of ruderal grassland, and 0.45 acre of woodland (Table 2.3.1-1, Section 2.3.1.2).

Implementation of Measures BIO-1 (Section 2.3.1.3) and BIO-6 (Section 2.3.2.4)

would avoid potential indirect effects to special-status plants such as dust, spread of invasive species, or downstream changes in hydrology or sedimentation. Measure BIO-8 (Section 2.3.3.4) would further avoid or minimize potential impacts to the species, if present, by requiring surveys during each plant's blooming period and establishing buffers and other protective measures if the plants are found. Given the low potential for Congdon's tarplant, stinkbells, Diablo helianthella, and bristly leptosiphon to occur, impacts are considered less than significant.

Special-status animals (western pond turtle, western burrowing owl, San Francisco dusky-footed woodrat, American badger, nesting raptors, migratory birds, and special-status and "high priority" bat species) or potential habitat areas were observed during project surveys. The majority of permanent project impacts would be to disturbed vegetation (13.04 acres of 13.99 acres; see Table 2.3.1-1 in Section 2.3.1.2), and no aquatic areas would be permanently affected. Under the Caltrans Special Contract Provisions, tree removal would comply with the seasonal restrictions specified in the Migratory Bird Act, which would avoid significant impacts to nesting raptors, migratory birds, and many bats. Therefore, impacts to special-status animals are considered less than significant. Implementation of the measures described below would further reduce the potential for adverse impacts.

- No western pond turtles were observed during field visits, but Measures BIO-1 (Section 2.3.1.3), BIO-6 (Section 2.3.2.4), and BIO-9 (Section 2.3.4.4) would avoid temporary and permanent loss of upland dispersal and nesting habitat and aquatic basking habitat for the species.
- Western burrowing owl is not anticipated to be affected by the project due to lack of suitable habitat and signs of presence. Measure BIO-1 (Section 2.3.1.3), the Caltrans Migratory Bird Special Contract Provisions, and Measure BIO-11 (Section 2.3.4.4) would reduce the potential for impacts.
- San Francisco dusky-footed woodrat is likely to occur in the project area. Permanent impacts from tree removal in woodland habitat and temporary habitat loss during construction would be minimized through implementation of Measure BIO-12 (Section 2.3.4.4).
- American badger was not observed during field surveys, but potential habitat is present in less-disturbed grasslands in the southern portion of the project area. Measure BIO-13 (Section 2.3.4.4) would avoid or minimize permanent and temporary impacts to potential denning and foraging habitat for the species.
- Several raptors including Cooper's hawk, white-tailed kite, and American peregrine falcon may nest in the project area, and migratory birds including California yellow warbler, California horned lark, and loggerhead shrike may breed in the project area. Measure BIO-1 (Section 2.3.1.3), the Caltrans Migratory Bird Special Contract Provisions, and Measure BIO-10 would minimize impacts to raptors and migratory birds that have the potential to nest and forage in the project area.

- Measure BIO-14, in conjunction with Measure BIO-15 relating to nighttime work and construction noise and vibration impacts, would avoid or minimize potential effects to special-status and “high priority” bats.

Three **threatened and endangered species** have the potential to occur, or are known to occur, in the project area: California tiger salamander, California red-legged frog, and Alameda whipsnake. Potential impacts to California tiger salamander and California red-legged frog include 0.59 acre of permanent and 13.23 acres of temporary loss of upland dispersal, foraging, and refugia habitat, and habitat fragmentation. The project would also have 0.59 acre of permanent and 13.23 acres of temporary impacts to potential dispersal and foraging habitat for Alameda whipsnake.

All temporarily impacted areas would be restored on-site. A combination of general measures to avoid or minimize erosion, sedimentation, and pollution (Measures BIO-1 in Section 2.3.1.3 and BIO-6 in Section 2.3.2.4); Measure BIO-5 (Section 2.3.1.3) to maintain habitat connectivity between the east and west sides of I-680; and specific measures to reduce impacts to these species and their habitats (Measures BIO-16 and BIO-18 in Section 2.3.5.4) would be implemented. In addition, to mitigate for permanent direct effects to California tiger salamander, California red-legged frog, and Alameda whipsnake, Caltrans proposes to purchase habitat credits at a 3:1 ratio from an approved mitigation bank (Measure BIO-17 in Section 2.3.5.4). With implementation of Measure BIO-17, impacts to California tiger salamander, California red-legged frog, and Alameda whipsnake would be less than significant.

- b) Less Than Significant Impact with Mitigation Incorporated. The Build Alternative would permanently impact less than 0.5 acre of coast live oak woodland, valley oak woodland, and mixed oak woodland (Table 2.3.1-1 in Section 2.3.1.2). Up to 821 trees may be permanently impacted (removed or heavily pruned), and 231 trees may be temporarily impacted (compaction of root zone or minor pruning) by project activities. No impacts to riparian scrub and forest or aquatic habitat are anticipated.

Potential impacts would be reduced through implementation of general measures such as establishment of ESAs, erosion control measures, and restoration of temporarily disturbed areas (Measure BIO-1 in Section 2.3.1.3) and measures to minimize construction-related impacts to trees (Measure BIO-3 in Section 2.3.1.3). In addition, to mitigate for temporary effects to sensitive natural communities, Caltrans proposes on-site habitat restoration, and, if insufficient space is available in the ROW, preservation of off-site like-habitat through the purchase of mitigation bank credits (Measure BIO-2 in Section 2.3.1.3). Tree removal would be mitigated on-site in accordance with CDFW requirements as described in Measure BIO-4 (Section 2.3.1.3), with potential off-site mitigation if insufficient space is available in the ROW. With implementation of Measures BIO-2 and BIO-4, impacts to sensitive natural communities would be less than significant.

- c) Less Than Significant Impact with Mitigation Incorporated. The Build Alternative has the potential to temporarily impact less than 0.01 acre of potentially jurisdictional other waters of the United States. No impacts to wetlands and no permanent impacts to potentially jurisdictional other waters of the U.S. are anticipated (Section 2.3.2.3). Implementation of Measure BIO-6 (Section 2.3.2.4) would avoid or minimize

- potential construction-related impacts on wetlands and other waters by use of barriers to prevent sediment discharge, cleaning of construction equipment, and restoration of temporarily impacted areas. In addition, Caltrans would provide compensatory mitigation for impacts to wetlands and other aquatic resources, as described in Measure BIO-7 (Section 2.3.2.4). With implementation of Measure BIO-7, impacts to potentially jurisdictional other waters of the United States would be less than significant.
- d) **Less Than Significant Impact.** The project is not anticipated to negatively impact wildlife movement between the west and east sides of I-680. The project would not result in a substantial increase in impermeable surfaces or a decrease in the vegetated ROW adjacent to the roadway. Temporarily impacted vegetation communities would be restored. Nighttime construction activities have the potential to affect wildlife behavior (Section 2.3.1.2). Measures BIO-5 and BIO-15 would minimize potential construction-related impacts and support wildlife movement through the project area.
 - e) **Less Than Significant Impact.** Trees are protected under the Alameda County Tree Ordinance (Title 12, Chapter 12.11) and the Contra Costa County Tree Protection and Preservation Ordinance. Although local ordinances do not apply to the State ROW, Measures BIO-3 and BIO-4 (Section 2.3.1.3), which propose to protect or replant trees, are consistent with the goal of tree preservation.
 - f) **No Impact.** No habitat conservation plans or natural community conservation plans are currently in effect for the project area (Section 2.1.2.1).

CULTURAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	-	-	X	-
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	-	-	X	-
c) Disturb any human remains, including those interred outside of formal cemeteries?	-	-	X	-

- a) – c) **Less Than Significant Impact.** The APE contains a prehistoric archaeological site that has been determined eligible for listing in the NRHP. The site is also a historic resource for purposes of CEQA. The site will be designated as an Environmentally Sensitive Area (ESA) to ensure avoidance for the duration of the project (Measure CUL-3).

Implementation of Measures CUL-1 and CUL-2 would minimize potential disturbance to human remains and cultural materials if encountered during construction. No mitigation is necessary.

ENERGY

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	-	-	X	-
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	-	-	X	-

- a) Less Than Significant Impact. The direct energy consumption in the project region is expected to improve in 2025 and 2045 relative to existing conditions for both the No Build and Build alternatives due to expected improvements in vehicle fuel economy. Compared with the No Build Alternative, the Build Alternative would increase direct energy consumption by 0.15 percent in 2025 and 0.46 percent in 2045, and also increase annual indirect energy consumption by 0.3 percent in 2025 and by 0.5 percent in 2045. As noted in Section 2.2.7.3, these percentages are considered conservative because they do not reflect potential reductions in fuel consumption associated with high-occupancy travel modes, or the fact that electric vehicle fuel consumption was conservatively assumed to be the same for the years 2025 and 2045 as the year 2018. In addition, the Build Alternative would include additional TMS measures, energy-efficient lighting, and, where economically and logistically advantageous, recycling and reuse.

Energy use during project construction would be temporary and a necessary commitment or expenditure that is associated with any infrastructure improvement project. Energy use during construction would be minimized to the maximum extent practicable.

As such, the project would not result in an inefficient, wasteful, and unnecessary consumption of energy.

- b) Less Than Significant Impact. Conservative estimates of energy consumption indicated that the Build Alternative would slightly increase consumption relative to the No Build Alternative (less than 0.5 percent); however, as noted above and in Section 2.2.7.3, the Build Alternative may increase fuel economy by supporting high-occupancy travel modes and would include additional TMS measures, energy-efficient lighting, and, where economically and logistically advantageous, recycling

and reuse. The proposed project would contribute to the completion of the regional network of HOV/express lanes envisioned in the RTP and support RTP initiatives to increase carpools, vanpools, and public transit that would use HOV/express lanes. Operation of the proposed project would not conflict with a state or local plan for renewable energy or energy efficiency.

Energy consumption during project construction would be temporary and minimized to the maximum extent practicable. Project construction would not conflict with a state or local plan for renewable energy or energy efficiency.

GEOLOGY AND SOILS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	-	-	-	X
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	-	-	-	X
ii) Strong seismic ground shaking?	-	-	-	X
iii) Seismic-related ground failure, including liquefaction?	-	-	-	X
iv) Landslides?	-	-	-	X
b) Result in substantial soil erosion or the loss of topsoil?	-	-	-	X
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	-	-	-	X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	-	-	-	X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	-	-	-	X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	-	-	X	-

- a) No Impact. As stated at the beginning of Chapter 2, Caltrans' design and construction guidelines incorporate engineering standards that address seismic risks. Project elements will be designed and constructed to meet seismic design requirements for ground shaking and ground motions, as determined for the project vicinity and site conditions. Caltrans also requires additional geotechnical subsurface and design investigations to be performed during the final project design and engineering phase. These standards and requirements would avoid the potential for adverse impacts.
- b) – e) No Impact. Answered under criterion a, above.
- f) Less Than Significant Impact. Proposed project activities would encounter geologic units that are known to have high paleontological sensitivity. Caltrans Standard Specification 14-7.03 will be implemented to provide for stopping work, securing the area, and performing further investigation if paleontological resources are encountered during project construction. Implementation of Measure PAL-1 (Section 2.2.3.4) would minimize potential effects on paleontological resources, if present.

GREENHOUSE GAS EMISSIONS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	-	-	X	-
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	-	-	X	-

- a) Less than Significant Impact. Section 3.4.3 provides an analysis of operational and construction-related GHG emissions.

A quantitative analysis of operational daily CO₂ emissions was performed as described in Section 3.4.3.1 to compare the potential effects of the Build and No Build Alternatives (Table 3.4-2). Daily CO₂ emissions estimated for both the Build and No Build Alternatives in the opening year (2025), horizon year (2040), and design year (2045) would be lower than the existing year (2018), because federal and state fuel economy standards are expected to reduce GHG emissions over time. The estimated daily CO₂ emissions for the Build Alternative during the opening year, horizon year, and design year scenarios would be slightly higher (up to 0.3 percent) than the emissions for the No Build Alternative.

The model results do not fully account for a vehicle's modal events, such as acceleration and deceleration due to traffic congestion, that contribute to CO₂ emissions. The Build Alternative would reduce vehicle hours of delay in the traffic study area by 46 percent and 54 percent in 2025 and 2045, respectively, during the AM period; and by 34 percent and 23 percent in 2025 and 2045, respectively, during

the PM period (Fehr & Peers 2019). Therefore, the daily CO₂ emissions for the Build Alternative during the opening year, horizon year, and design year scenarios are likely lower than the No Build Alternative. In conclusion, the Build Alternative is not expected to result in an increase in CO₂ emissions compared to the existing year conditions or the future No Build Alternative. There is evidence of substantial progress in reducing emissions because there is a reduction in future emissions with the project compared to existing emissions.

Project construction CO₂e emissions were quantified as described in Section 3.4.3.2 and are estimated at a total value of 4,877 metric tons or an annual average of 1,829 metric tons (Table 3.4-3). The project would implement measures to reduce construction emissions, such as maintenance of construction equipment and vehicles, limiting of construction vehicle idling time, and scheduling and routing of construction traffic, as outlined in Section 2.2.5.3. As noted in Section 1.4.1.5, a TMP will be prepared during the design phase of the project to minimize traffic delays during construction, which will help reduce GHG emissions from idling vehicles.

- b) Less Than Significant Impact. Section 3.4.3.3 describes the various plans, policies and regulations adopted for the purpose of reducing the emissions of greenhouse gases that are applicable to the proposed project and describes how the project would be consistent. The proposed project would construct express lanes that would serve transit and other HOVs and would therefore be consistent with local Climate Action Plans (e.g., cities of Pleasanton, Dublin, and San Ramon) that encourage or prioritize transit ridership and alternatives to solo driving. The project would be consistent with SB 375 as it is included in the current RTP, *Plan Bay Area 2040* (as amended in 2020), and will incorporate applicable GHG reduction measures from the EIR prepared in support of the RTP. Because GHG emissions for the Build Alternative would be lower for Design Year 2045 compared to Existing Year (see Table 3.4-2), the proposed project would align with policies to keep the state on a trajectory for progress toward the EO S-3-05 2050 emission reduction target. The project would not conflict with transportation goals identified in the CARB Scoping Plan and would be consistent with GHG reduction strategies identified in the Scoping Plan. Therefore, the proposed project would not conflict with EO S-3-05. Similarly, since the proposed project would result in a reduction in GHG emissions for Opening Year 2025 compared to the Existing Year (as shown in Table 3.4-2), the project would align with policies to keep the state on a trajectory for progress toward the EO B-30-15 2030 emission reduction target and would not conflict with SB 32.

HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	-	-	X	-
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	-	-	X	-
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	-	-	X	-
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	-	-	X	-
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	-	-	-	X
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	-	-	X	-
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	-	-	X	-

- a) Less Than Significant Impact. As noted in Section 2.2.4.3, project construction and maintenance activities are expected to involve the routine transport, use, and disposal of hazardous materials (e.g., fuels, paints, and lubricants) that could pose a significant threat to human health or the environment if not properly managed. Adherence to federal and state regulations during project construction and maintenance reduces the risk of exposure to hazardous materials and accidental hazardous materials releases. Compliance with existing regulations is mandatory; therefore, construction of the Build Alternative is not expected to create a hazard to construction workers, the public, or the environment through the routine transport, use, disposal, or accidental release of hazardous materials.
- b) Less Than Significant Impact. Construction and maintenance of the Build Alternative could result in the potential disturbance of hazardous materials in soil, groundwater, and building materials in the project corridor. Implementation of Measure HAZ-1 described in Section 2.2.4.4 would ensure that potential hazardous materials in soil, groundwater, and building materials are investigated before construction and site-

specific control measures are incorporated into the final project design to address the potential adverse effects to human health and the environment that could result from the disturbance of hazardous materials. Further, compliance with existing regulations is expected to limit the risk of a reasonably foreseeable upset or accident and minimize the impact to the public and environment should an accident occur.

- c) Less Than Significant Impact. There are schools within 0.25 mile of the project area; however, compliance with existing regulations is expected to limit the risk of emitting or handling hazardous materials near the schools.
- d) Less Than Significant Impact. There are 83 hazardous materials sites within 1 mile of the project area. Thirteen active release sites were identified within, adjacent to, or hydraulically upgradient of the project area, and 15 closed release sites were identified adjacent to the project area. The other 55 release sites are not expected to pose a threat of affecting environmental conditions within the project area because a pathway for contaminant migration does not exist. The project area potentially contains soils and groundwater contaminated with petroleum hydrocarbons, chlorinated solvents, and metals. Implementation of Measure HAZ-1 described in Section 2.2.4.4 would minimize the potential to create a significant hazard to the environment or the public.
- e) No Impact. There are no airports within 2 miles of the project and the project area is not included in an airport land use plan.
- f) Less Than Significant Impact. The Build Alternative would not impair implementation of an emergency response or emergency evacuation plan. The purpose of the project is to optimize freeway systems management and traffic operations. The added infrastructure such as traffic monitoring could be leveraged by first responders in coordination with Caltrans during an evacuation to assist with the flow of emergency traffic and communications. During construction, the TMP will minimize construction-related delays and include coordination with CHP and local law enforcement agencies.
- g) Less Than Significant Impact. The Build Alternative would not change the alignment of I-680 or any adjacent land uses. Section 3.3.3 describes fire hazard conditions in the project area and the reasons why the Build Alternative is not anticipated to exacerbate wildfire risks. Project construction and operation would not expose people or structures to significant risks involving wildland fires.

HYDROLOGY AND WATER QUALITY

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	-	-	X	-
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	-	-	X	-
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	-	-	X	-
(i) result in substantial erosion or siltation on- or off-site;	-	-	X	-
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	-	-	X	-
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	-	-	X	-
(iv) impede or redirect flood flows?			X	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	-	-	X	-
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	-	-	X	-

- a) Less Than Significant Impact. The Build Alternative would have an estimated DSA of 75.42 acres. Temporary impacts to water quality may result from disturbance related to construction activities. Although the temporary impacts from soil disturbance and the operation of construction equipment have the potential to negatively impact water quality, construction site BMPs for erosion and sediment control and material management, as specified in the required SWPPP (described in Section 1.4.1.5) would be used during construction to avoid or reduce impacts. These measures are consistent with the practices required under the Construction General Permit and the Caltrans existing MS4 permit and are intended to achieve compliance with the requirements of the permits. With implementation of the short-term and long-term BMPs listed in Section 2.2.2.4, effects to surface and ground water quality would be less than significant.

- b) Less Than Significant Impact. The added impervious surface from the project has the potential to reduce the available unpaved area where runoff can infiltrate into native soils and recharge aquifers. The Sunol Valley and Livermore Valley groundwater basins total approximately 81,000 acres. The additional impervious area is minimal in comparison with the total area of the local aquifers and groundwater basins.
- c) Less Than Significant Impact. The project would not alter the course of a stream or river but would increase impervious surfaces (10.87 acres of net new impervious area and 35.47 acres of replaced impervious surface, for a total of 46.34 acres of new and reconstructed impervious area). The goal of the project drainage design would be to maintain existing drainage patterns. The project would be designed and implemented to reduce the potential for negative long-term impacts from polluted storm water runoff on receiving water bodies and to retain, detain, or infiltrate runoff and match post-project flows and durations to pre-project patterns. Hydromodification management measures would be included in the design of all storm water discharges to Waters of the State as required of all projects with the potential to result in hydromodification and require a 401 Water Quality Certification from the RWQCB. In addition, the project would be designed to meet trash capture requirements where feasible.

Implementation of standard Caltrans practices for erosion control (Section 1.4.1.5, under “Erosion Control and Construction Discharges”) and measures WQ-1 through WQ-4 (Section 2.2.2.4) would avoid or minimize the project’s potential to result in substantial erosion or siltation, increase runoff volumes in a way that would result in flooding, exceed drainage system capacity or provide substantial polluted runoff, or impede or redirect flood flows. These measures are incorporated into the project design as a matter of Caltrans practice and are not mitigation.

- d) Less Than Significant Impact. There are 11 FEMA Special Flood Hazard Areas near or within the project limits (see Section 2.2.1.2). The proposed improvements within the floodplain include outer widening of the roadway and the bridge over Amador Valley Boulevard and construction of retaining walls. However, the fill associated with retaining wall placement would not encroach on the channel or be within the inundation elevations; therefore, it is not anticipated to increase flooding. The inundations from the base flood are anticipated to be similar to those with existing conditions and are not anticipated to create additional traffic interruptions due to flooding. The Build Alternative would not affect the potential for a pollutant release from a flood, tsunami, or seiche event in the project area.
- e) Less Than Significant Impact. The project is required to adhere to the CWA, the Porter-Cologne Water Quality Control Act, the Caltrans MS4 Permit, and the other laws and regulations described in Section 2.2.2.1. As a result, the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

LAND USE AND PLANNING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	-	-	-	X
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	-	-	-	X

- a) No Impact. The project would be constructed within the state ROW and would not physically divide an established community.
- b) No Impact. As described in Section 2.1.2.2, the project would be generally consistent with all applicable land use plans, policies, and regulations. The project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted to avoid or mitigate an environmental effect.

MINERAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	-	-	-	X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	-	-	-	X

- a), b) No Impact. I-680 south of the SR 84 interchange crosses areas classified as mineral resource zones. Mineral resources reported in the vicinity of the project area include sand, gravel, stone, and manganese. The project would not require acquisition of lands classified as mineral resource zones; therefore, no impact would occur.

NOISE

Would the project result in:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	-	-	X	-
b) Generation of excessive groundborne vibration or groundborne noise levels?	-	-	X	-
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	-	-	-	X

- a) Less Than Significant. When in operation, the Build Alternative is anticipated to increase future (2045) noise levels at most receiver locations by 0 to 3 dBA over existing conditions and by 0 to 2 dBA over the No Build condition. Noise level increases of 1 to 2 dB are generally not perceptible, and increases of 3 dB are just detectable (Section 2.2.6.2, under “Human Response to Changes in Noise Levels”). Future noise level increases of 0 to 3 dBA over existing conditions do not represent a substantial permanent increase and would be less than significant. However, projected highway noise levels for 2045 are expected to approach or exceed the NAC at a number of receivers in the study area. Noise abatement in the form of new and replacement sound walls was considered in accordance with NEPA and 23 CFR 772 (Section 2.2.6.4). Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of barriers at three locations (Barriers 11, 13–Relocated, and 14A–Relocated; see Section 2.2.6.4, under “Noise Abatement Evaluation Summary”). The final decision on noise abatement will be made upon completion of the project design.

Construction noise would be short-term and intermittent in most locations. Typically, construction work taking place within the Caltrans right-of-way is not subject to local noise ordinances; however, Caltrans will work with the contractor to meet local requirements where feasible. As noted in Measure NOI-1 (Section 2.2.6.4, under “Short-Term [Construction] Noise”), standard Caltrans measures that are used for all projects include that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9 PM and 6 AM.

The City of Pleasanton Municipal Code limits construction noise to 83 dBA at 25 feet or 86 dBA outside of the property plane, which in this case is the right-of-way, between 8 AM and 8 PM on weekdays and Saturdays and between 10 AM and 6 PM on Sundays and holidays. Two locations are anticipated to experience short-term construction noise levels during the grubbing/clearing/grading phase that would

exceed the City of Pleasanton noise limit of 86 dBA outside of the ROW: R-7 (Centennial Trail), and R-12 (Elmwood Cir - 1), as shown in Section 2.2.6.4, Table 2.2.6-6. Construction would be limited to temporary short-term periods at any one location, and standard Caltrans measures that are used for all projects would limit construction noise.

High temporary daytime noise levels may occur at receptors near locations where pile driving and other construction activities are proposed (Section 2.2.6.4, Table 2.2.6-6). Some work, such as bridge widening and construction of retaining walls and sound walls, could require nighttime impact pile driving or installation of CIDH piles to minimize traffic disruption. Impact pile driving at any one location would be short term but would generate substantially higher hourly noise levels than existing nighttime levels (Section 2.2.6.4, Table 2.2.6-7). Measure NOI-1 (Section 2.2.6.4, under “Short-Term [Construction] Noise”) includes that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9 PM and 6 AM and limits pile driving activities to between 7 AM and 7 PM, where feasible. Implementation of Measure NOI-1 would reduce short-term (construction) noise impacts to less than significant.

In the area between Amador Valley Boulevard and Alcosta Boulevard, the project would require removing and reconstructing part of two sound walls on retaining walls. The existing sound walls may need to be removed before the replacement sound walls are reconstructed (see Section 2.2.6.3, under “Barrier Replacement Areas”). Without sound walls in place and without other construction noise, traffic noise is estimated to temporarily increase by up to 6 dBA. The duration of the temporary noise increase could be minimized by removing and reconstructing the new barriers in segments to reduce the number of receptors that would be exposed to freeway noise. If the new barriers were constructed in segments, the temporary noise increase could last approximately 3 months at each location. Measure NOI-1 includes that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9 PM and 6 AM and limits pile driving activities to between 7 AM and 7 PM, where feasible. Implementation of Measure NOI-1 would reduce short-term (construction) noise impacts to less than significant.

- b) Less Than Significant. As described in Section 2.2.6.3 (under “Construction Vibration”), impact pile driving is not proposed in the vicinity of the technology buildings in the business park on Arlington Drive, but vibratory rollers would be used for soil compaction. At a distance of 500 feet, vibratory roller use would not be perceptible and no structural damage would occur, but vibration sensitive equipment could be affected at 0.004 in/sec PPV and lower depending on the sensitivity of the equipment and whether vibration isolation tables are used. The project would not generate excessive vibration after construction or result in groundborne noise levels.
- c) No Impact. There are no airports within 2 miles of the project.

POPULATION AND HOUSING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	-	-	-	X
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	-	-	-	X

- a) No Impact. The additional capacity for HOVs and toll-paying SOVs and the travel time improvements from the project could make the communities along the project corridor more attractive locations for new housing and businesses. However, development and intensification of land uses are restricted by the land use plans and urban growth boundaries/city limit lines described in Section 2.1.2.1. The project would accommodate planned growth but would not affect land use decisions in a way that would encourage growth beyond reasonably foreseeable levels.
- b) No Impact. The project would not require residential or business relocation and therefore would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Fire protection?	-	-	X	-
Police protection?	-	-	X	-
Schools?	-	-	-	X
Parks?	-	-	-	X
Other public facilities?	-	-	-	X

- a) Less Than Significant Impact. Temporary lane closures on I-680 will be required to construct the project, which could affect emergency service providers. During final design, a TMP will be developed for the project to minimize construction-related delays. The TMP will include notification to emergency service providers and the public of lane closures and detours; coordination with CHP and local law enforcement on contingency plans; and using portable Changeable Message Signs, CHP's Construction Zone Enhanced Enforcement Program, and Freeway Service Patrol where possible to minimize delays. Therefore, no emergency services would be temporarily affected by construction of the project. Law enforcement, fire, and/or emergency services would be maintained during project construction and operation of the lanes. The project is not expected to result in decreased response times. Although parks and schools are within 0.25 mile of the project area, no schools or parks are in the project area.

RECREATION

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	-	-	-	X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	-	-	-	X

- a) No Impact. The project would accommodate planned growth but would not increase the use of existing parks or other recreational facilities such that physical deterioration of the facility would occur or be accelerated.
- b) No Impact. The project would not include recreational facilities or require the construction or expansion of recreational facilities.

TRANSPORTATION

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	-	-	X	-
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	-	-	X	-
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	-	-	-	X
d) Result in inadequate emergency access?	-	-	X	-

- a) Less Than Significant Impact. The Build Alternative would be generally consistent with applicable programs, plans, ordinances, and policies regarding the circulation system, which are described in Sections 2.1.2.1 and Sections 2.1.2.2.
- b) Less Than Significant Impact. SB 743 (2013) requires the Governor's Office of Planning and Research (OPR) to identify new metrics for identifying and mitigating transportation impacts within CEQA. Under SB 743, CEQA Guidelines Section

15064.3(b) was revised to identify Vehicle Miles Traveled (VMT) as the most appropriate measure of assessing transportation impacts. For transportation projects, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. Regulatory changes to the CEQA Guidelines that implement SB 743 were approved on December 28, 2018. July 1, 2020 is the statewide implementation date (Caltrans 2020).

As Caltrans had not issued final guidance on implementing SB 743 at the time this document was prepared, Level of Service (LOS) is used as the CEQA significance threshold. Projected VMT is also presented in Section 2.1.7.2 for informational purposes. The LOS standard adopted by the Alameda CTC for the Congestion Management Program and the Metropolitan Transportation System roadway segments (e.g., I-580, I-680, SR 84) is LOS E. The following is a summary of levels of service in the traffic study area, with and without the project. For more information, see Section 2.1.7.2.

2025 No Project: During the AM peak, southbound I-680 would operate at LOS F between the I-580 westbound off-ramp and the Sunol Boulevard on-ramp merge, and northbound I-680 would operate at LOS E or better. During the PM peak, the I-580 westbound off-ramp and the Sunol Boulevard on-ramp merge would operate at LOS F, and northbound I-680 would operate at LOS F between the Bernal Avenue off-ramp and the Stoneridge Drive loop on-ramp.

2025 Plus Project: During the AM peak, northbound and southbound I-680 would operate at LOS E or better. During the PM peak, two short areas (Stoneridge Drive off-ramp to the Stoneridge Drive loop on-ramp, and Stoneridge Drive diagonal on-ramp to southbound I-680) would operate at LOS F, which represents an overall improvement compared to No Project conditions.

2045 No Project: During the AM peak, southbound I-680 would operate at LOS F between the Bollinger Canyon Road diagonal on-ramp merge and the Sunol Boulevard on-ramp merge, northbound I-680 would operate at LOS F between the Stoneridge Drive diagonal on-ramp and the Alcosta Boulevard on-ramp merge, and all other northbound segments would operate at LOS E or better. During the PM peak, southbound I-680 would operate at LOS F between the Bollinger Canyon Road diagonal on-ramp merge and the Stoneridge Drive diagonal on-ramp merge, northbound I-680 would operate at LOS F between the Mission Boulevard (SR 238) off-ramp and the Stoneridge Drive loop on-ramp, and all other northbound segments would operate at LOS E or better.

2045 Plus Project: During the AM peak, southbound I-680 would operate at LOS E or better except between the Paloma Way (SR 84) off-ramp gore and the Paloma Way (SR 84) on-ramp gore, which would operate at LOS F, and the Sunol Boulevard on-ramp merge, which would operate near the cusp of LOS E/F. During the AM peak, northbound I-680 would operate at LOS E or better except between Dublin Boulevard and Alcosta Boulevard and the Alcosta Boulevard on-ramp merge, which would operate at LOS F. During the PM peak, southbound and northbound I-680 would operate at LOS E or better except for the following areas of LOS F conditions:

southbound I-680 from the Bollinger Canyon Road diagonal on-ramp merge as well as between the I-580 on-ramp and the Stoneridge Drive diagonal on-ramp; and northbound I-680 from the Mission Boulevard (SR 238) off-ramp to the Andrade Road on-ramp segment, and the Bernal Avenue on-ramp and the Stoneridge Drive loop on-ramp. These conditions represent an overall reduction in the number of segments operating at LOS F compared to Year 2045 No Project conditions.

With the Build Alternative, more of I-680 in the traffic study area would operate at LOS E or better during the AM and PM peak periods in both 2025 and 2045 than with the No Build Alternative. Therefore, it would be consistent with the LOS standard adopted by the Alameda CTC, and impacts would be less than significant.

- c) No Impact. The Build Alternative would not increase hazards due to a geometric design feature.
- d) Less Than Significant Impact. Temporary lane closures on I-680 will be required to construct the project, which could affect emergency access. During final design, a TMP will be developed for the project to minimize construction-related delays. The TMP will include notification to emergency service providers and the public of lane closures and detours; coordination with CHP and local law enforcement on contingency plans; and use of portable Changeable Message Signs, CHP's Construction Zone Enhanced Enforcement Program, and Freeway Service Patrol where possible to minimize delays. Law enforcement, fire, and/or emergency services would be maintained during project construction and operation of the lanes. The project is not expected to result in inadequate emergency access.

TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	-	-	-	X
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	-	-	-	X

a, b) No California Native American Tribe has identified a Tribal Cultural Resource (TCR) in the project area.

UTILITIES AND SERVICE SYSTEMS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	-	-	X	-
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	-	-	-	X
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	-	-	-	X
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	-	-	-	X
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	-	-	-	X

- a) Less Than Significant Impact. The Build Alternative would require relocation of some overhead and underground utilities, as discussed in Section 2.1.6.2. The relocations may result in short-term, temporary interruptions of service. No significant environmental effects would occur.
- b) No Impact. The Build Alternative would not require new or expanded water entitlements.
- c) No Impact. The Build Alternative would not affect public utilities for wastewater treatment.
- d) No Impact. The Build Alternative would not generate or require solid waste disposal in excess of state or local standards, or in excess of the capacity of local infrastructure. Construction waste would be disposed at a certified facility based on the waste type and would not affect landfill capacity.
- e) No Impact. The Build Alternative would comply with statutes and regulations related to solid waste management and reduction.

WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	-	-	X	-
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	-	-	X	-
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	-	-	X	-
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	-	-	X	-

- a) Less Than Significant Impact. The Build Alternative would not impair implementation of an emergency response or emergency evacuation plan. During project operation, the HOV/express lanes would provide additional capacity for emergency response and evacuation. The project would improve I-680 as a firebreak by increasing the overall freeway width, constructing biofiltration strips and swales, and removing some roadside vegetation. The added infrastructure such as traffic monitoring could be leveraged by first responders in coordination with Caltrans during an evacuation to assist with the flow of emergency traffic. Finally, the reduction in travel time with the project would support a decrease in emergency response time. During project construction, the TMP will minimize construction-related delays and include coordination with CHP and local law enforcement agencies.
- b) Less Than Significant Impact. The Build Alternative would not change the alignment of I-680 or any adjacent land uses. Project activities along the frontage of the property designated as a very high fire hazard severity zone would be limited to guardrail replacement, potential conduit work along the shoulder, and potential tree removal. The construction area would be separated from the property by an existing masonry wall of approximately 8 feet in height, which would remain in place. The presence of the masonry wall between the property and construction areas and use of standard measures such as watering active construction areas would avoid or minimize fire risk to the property.

In the State Responsibility Area south of Happy Valley Road, most project construction would take place in the median of I-680, and standard outside shoulder widths would be maintained. By 2045, traffic volume with the Build Alternative is anticipated to be approximately 2 percent higher than with the No Build Alternative;

however, the project components discussed above that would improve I-680 as a firebreak would offset any potential risk associated with the traffic volume increase. Therefore, the Build Alternative is not anticipated to exacerbate wildfire risks or expose project occupants to pollutants from a wildfire or the uncontrolled spread of a wildfire.

- c) Less Than Significant Impact. The Build Alternative would construct new safety lighting, signage, underground conduit, and associated electrical and communications infrastructure in the median and shoulder areas of I-680. Electrical equipment would be sited, installed, grounded, and protected by circuit breakers in compliance with Caltrans Standard Plans, local utility requirements, and applicable national fire protection standards. Cabinets would be rated to protect electrical equipment from damage and placed on raised concrete pads in unpaved areas in accordance with applicable standards. Therefore, installation or maintenance of associated infrastructure is not anticipated to increase the risk of wildland fires.
- d) Less Than Significant Impact. The Build Alternative would construct retaining walls in areas with cut slopes, remove approximately 61.5 acres of vegetation, and introduce 10.9 acres of new impervious surfaces. As noted in Section 1.4.1.5, the Build Alternative includes replacement planting in areas where planting is removed during construction and temporary and permanent BMPs to avoid the potential for project-related storm water discharges to substantially alter drainage patterns. Implementation of standard Caltrans practices for erosion control (Section 1.4.1.5) and measures WQ-1 through WQ-4 (Section 2.2.2.4) would avoid or minimize the project's potential to result in downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes. These measures are incorporated into the project design as a matter of Caltrans practice and are not mitigation.

MANDATORY FINDINGS OF SIGNIFICANCE

MANDATORY FINDINGS OF SIGNIFICANCE	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	-	-	X	-
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	-	-	X	-
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	-	-	X	-

- a) Less Than Significant Impact. The potential environmental impacts associated with project construction and operation, and the measures proposed to avoid or minimize those impacts, are disclosed in this IS and summarized in the checklist discussions above. Measures have been included to reduce impacts to resources such as special-status wildlife species and their habitats. With implementation of the proposed measures, the project would not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.
- b) Less Than Significant Impact. The project has been evaluated for cumulative impacts as described in Section 2.4. The project would not result in incremental effects to any resource that would be cumulatively considerable. The project would not contribute to cumulatively considerable impacts.
- c) Less Than Significant Impact. While human beings could be affected by a variety of the impacts described above, the project would not have substantial adverse effects on human beings, either directly or indirectly. With implementation of the proposed measures, the project would not have substantially adverse direct or indirect impacts on human beings.

3.3 Wildfire

3.3.1 Regulatory Setting

Senate Bill 1241 required the Office of Planning and Research, the Natural Resources Agency, and the California Department of Forestry and Fire Protection to develop amendments to the “CEQA Checklist” for the inclusion of questions related to fire hazard impacts for projects located on lands classified as very high fire hazard severity zones. The 2018 updates to the CEQA Guidelines expanded this to include projects “near” these very high fire hazard severity zones.

3.3.2 Affected Environment

Cal Fire has designated the freeway frontage of a single property on the west side of I-680 between Muirwood Drive and Foothill Knolls Drive as a very high fire hazard severity zone. The section of I-680 between Koopman Road and Happy Valley Road is designated as a high fire hazard severity zone, and section of I-680 between SR 84 and Koopman Road is designated as a moderate fire hazard severity zone. The remaining sections of I-680 within the project limits, including the small portion within Contra Costa County, are not designated as fire hazard severity zones (Cal Fire 2007a, 2007b, 2008, 2009).

The southern portion of the project area (south of Happy Valley Road) is designated as a California Office of Emergency Services State Responsibility Area, where the State of California is financially responsible for the prevention and suppression of wildfires.

3.3.3 Environmental Consequences

No Build Alternative

The No Build Alternative would not impair emergency response or evacuation or change fire hazard risk in the project area.

Build Alternative

The Build Alternative would not impair implementation of an emergency response or emergency evacuation plan. During project operation, the HOV/express lanes would provide additional capacity for emergency response and evacuation. The project would improve I-680 as a firebreak by increasing the overall freeway width, constructing biofiltration strips and swales (Section 1.4.1.5, under “Water Quality”), and removing some roadside vegetation (Section 2.3.1.2). The added infrastructure such as traffic monitoring could be leveraged by first responders in coordination with Caltrans during an evacuation to assist with the flow of emergency traffic. Finally, the reduction in travel time with the project (Section 2.1.7.2, under Measures of Effectiveness for 2025 and 2045) would support a decrease in emergency response time. During project construction, the TMP (Section 1.4.1.5) will minimize construction-related delays and include coordination with CHP and local law enforcement agencies.

The Build Alternative would not change the alignment of I-680 or any adjacent land uses. Project activities along the frontage of the property designated as a very high fire hazard severity zone would be limited to guardrail replacement, potential conduit work along the shoulder, and potential tree removal. The construction area would be separated from the property by an

existing masonry wall of approximately 8 feet in height, which would remain in place. The presence of the masonry wall between the property and construction areas and use of standard measures such as watering active construction areas (Section 2.2.5.3, under “Construction [Short-Term] Impacts”) would avoid or minimize fire risk to the property.

In the State Responsibility Area south of Happy Valley Road, most project construction would take place in the median of I-680, and standard outside shoulder widths would be maintained. By 2045, traffic volume with the Build Alternative is anticipated to be approximately 2 percent higher than with the No Build Alternative (Section 2.1.7.2, under Measures of Effectiveness for 2025 and 2045); however, the project components discussed above that would improve I-680 as a firebreak would offset any potential risk associated with the traffic volume increase. Therefore, the Build Alternative is not anticipated to exacerbate wildfire risks or expose project occupants to pollutants from a wildfire or the uncontrolled spread of a wildfire.

The Build Alternative would construct new safety lighting, signage, underground conduit, and associated electrical and communications infrastructure in the median and shoulder areas of I-680 (Section 1.4.1.5). Electrical equipment would be sited, installed, grounded, and protected by circuit breakers in compliance with Caltrans Standard Plans, local utility requirements, and applicable national fire protection standards. Cabinets would be rated to protect electrical equipment from damage and placed on raised concrete pads in unpaved areas in accordance with applicable standards. Therefore, installation or maintenance of associated infrastructure is not anticipated to increase the risk of wildland fires.

The Build Alternative would construct retaining walls in areas with cut slopes, remove approximately 61.5 acres of vegetation (Section 2.3.1.2), and introduce 10.9 acres of new impervious surfaces (Section 2.2.1.3). As noted in Section 1.4.1.5, the Build Alternative includes replacement planting in areas where planting is removed during construction and temporary and permanent BMPs to avoid the potential for project-related storm water discharges to substantially alter drainage patterns. Implementation of standard Caltrans practices for erosion control (Section 1.4.1.5, under “Erosion Control and Construction Discharges”) and measures WQ-1 through WQ-4 (Section 2.2.2.4) would avoid or minimize the project’s potential to result in downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes.

3.3.4 Avoidance, Minimization, and/or Mitigation Measures

No additional avoidance, minimization, or mitigation is required.

3.4 Climate Change

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 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 by the United Nations and World Meteorological Organization in 1988 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 (CO₂), methane, nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, and various hydrofluorocarbons (HFCs). CO₂ is the most abundant GHG; while it is a naturally occurring component of Earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated CO₂.

Two terms are typically used when discussing how to address the impacts of climate change: “greenhouse gas mitigation” and “adaptation.” Greenhouse gas mitigation covers the activities and policies aimed at reducing GHG emissions to limit or “mitigate” the impacts of climate change. Adaptation, on the other hand, is concerned with planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels). This analysis will include a discussion of both.

3.4.1 Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce GHG emissions from transportation sources.

3.4.1.1 Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

NEPA (42 USC Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

FHWA recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices (FHWA 2019). This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom line of sustainability” (FHWA n.d.). Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects. The most important of these was

the Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Economy (CAFE) Standards. This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the CAFE program based on each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

Energy Policy Act of 2005, 109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) the establishment of the Office of Indian Energy Policy and Programs within the Department of Energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

The USEPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) is responsible for setting GHG emission standards for new cars and light-duty vehicles to significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. Fuel efficiency standards directly influence GHG emissions.

3.4.1.2 State

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and executive orders (EOs) including, but not limited to the following:

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 year 1990 levels by 2050. This goal was further reinforced with the passage of AB 32 in 2006 and SB 32 in 2016.

AB 32, Chapter 488, 2006, Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals outlined in EO S-3-05, while further mandating that CARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

EO S-01-07 (January 18, 2007): This order sets 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 the year 2020. CARB re-adopted the low carbon fuel standard regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

SB 375, Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires CARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization for each region must then develop a "Sustainable Communities Strategy"

that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

SB 391, Chapter 585, 2009, California Transportation Plan: This bill requires the State's long-range transportation plan to identify strategies to address California's climate change goals under AB 32.

EO B-16-12 (March 2012) orders State entities under the direction of the Governor, including CARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

EO B-30-15 (April 2015) establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent (MMTCO_{2e}). Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, Safeguarding California, every 3 years, and to ensure that its provisions are fully implemented.

SB 32, Chapter 249, 2016, codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

SB 1386, Chapter 545, 2016, declared "it to be the policy of the state that the protection and management of natural and working lands ... is an important strategy in meeting the state's greenhouse gas reduction goals, and would require all state agencies, departments, boards, and commissions to consider this policy when revising, adopting, or establishing policies, regulations, expenditures, or grant criteria relating to the protection and management of natural and working lands."

AB 134, Chapter 254, 2017, allocates Greenhouse Gas Reduction Funds and other sources to various clean vehicle programs, demonstration/pilot projects, clean vehicle rebates and projects, and other emissions-reduction programs statewide.

SB 743, Chapter 386 (September 2013): This bill changes the metric of consideration for transportation impacts pursuant to CEQA from a focus on automobile delay to alternative methods focused on vehicle miles travelled, to promote the state's goals of reducing greenhouse gas emissions and traffic related air pollution and promoting multimodal transportation while balancing the needs of congestion management and safety.

SB 150, Chapter 150, 2017, Regional Transportation Plans: This bill requires ARB to prepare a report that assesses progress made by each metropolitan planning organization in meeting their established regional greenhouse gas emission reduction targets.

EO B-55-18 (September 2018) sets a new statewide goal to achieve and maintain carbon neutrality no later than 2045. This goal is in addition to existing statewide targets of reducing GHG emissions.

EO N-19-19 (September 2019) advances California's climate goals in part by directing the California State Transportation Agency to leverage annual transportation spending to reverse the trend of increased fuel consumption and reduce GHG emissions from the transportation sector. It orders a focus on transportation investments near housing, managing congestion, and encouraging alternatives to driving. This EO also directs ARB to encourage automakers to produce more clean vehicles, formulate ways to help Californians purchase them, and propose strategies to increase demand for zero-emission vehicles.

3.4.2 Environmental Setting

The project area is rural and semi-rural south of Sunol Boulevard and suburban north of Sunol Boulevard. Most of southbound I-680 in the project area operates at LOS E or F during the AM peak period, and northbound I-680 operates at LOS E or F between approximately I-580 and Stoneridge Drive during the AM peak period (Section 2.1.7.1). *Plan Bay Area 2040*, the region's RTP/SCS, guides transportation and housing development in the project area, and the Cities of Pleasanton, Dublin, and San Ramon and Alameda County have climate action plans that address GHGs in the project area.

A GHG emissions inventory estimates the amount of GHGs discharged into the atmosphere by specific sources over a period of time, such as a calendar year. Tracking annual GHG emissions allows countries, states, and smaller jurisdictions to understand how emissions are changing and what actions may be needed to attain emission reduction goals. U.S. EPA is responsible for documenting GHG emissions nationwide, and the ARB does so for the state, as required by H&SC Section 39607.4.

3.4.2.1 National GHG Inventory

The U.S. EPA prepares a national GHG inventory every year and submits it to the United Nations in accordance with the Framework Convention on Climate Change. The inventory provides a comprehensive accounting of all human-produced sources of GHGs in the United States, reporting emissions of CO₂, CH₄, N₂O, HFCs, perfluorocarbons, SF₆, and nitrogen trifluoride. It also accounts for emissions of CO₂ that are removed from the atmosphere by "sinks" such as forests, vegetation, and soils that uptake and store CO₂ (carbon sequestration). The 1990–2016 inventory found that of 6,511 MMTCO₂e GHG emissions in 2016, 81% consist of CO₂, 10% are CH₄, and 6% are N₂O; the balance consists of fluorinated gases (EPA 2018a). In 2016, GHG emissions from the transportation sector accounted for nearly 28.5% of U.S. GHG emissions.

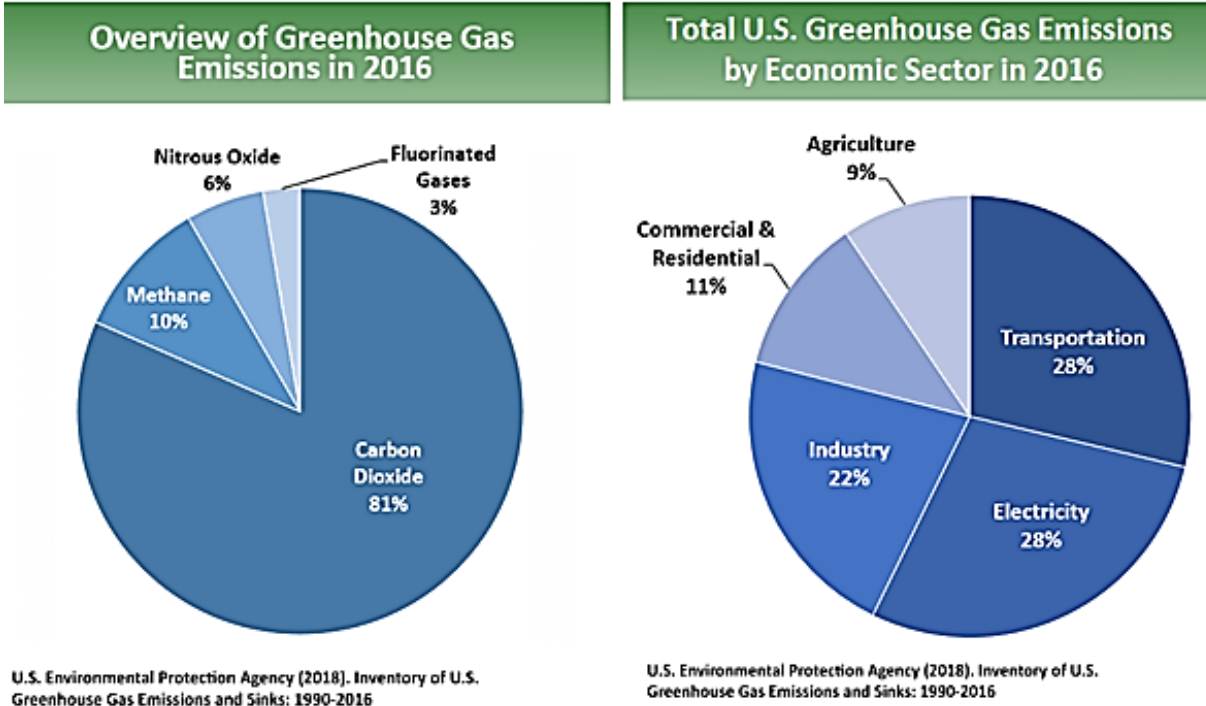


Figure 3.4-1: U.S. 2016 Greenhouse Gas Emissions

3.4.2.2 State GHG Inventory

ARB collects GHG emissions data for transportation, electricity, commercial/residential, industrial, agricultural, and waste management sectors each year. It then summarizes and highlights major annual changes and trends to demonstrate the state's progress in meeting its GHG reduction goals. The 2019 edition of the GHG emissions inventory found total California emissions of 424.1 MMTCO₂e for 2017, with the transportation sector responsible for 41% of total GHGs. It also found that overall statewide GHG emissions declined from 2000 to 2017 despite growth in population and state economic output (CARB 2019b).

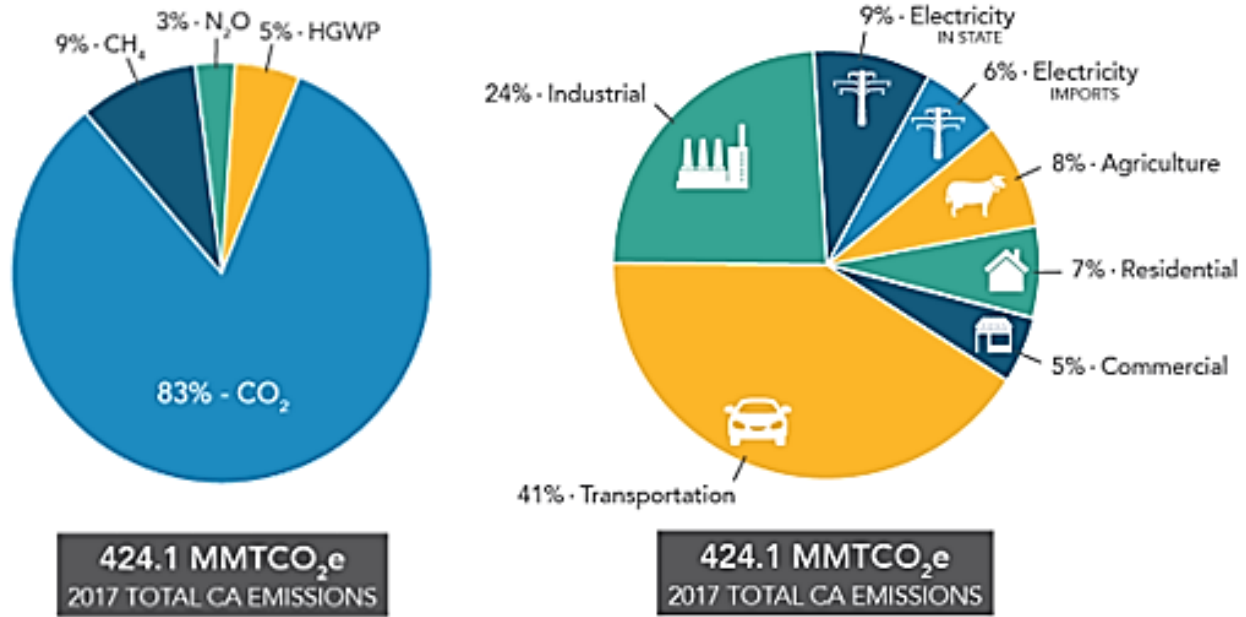


Figure 3.4-2: California 2017 Greenhouse Gas Emissions

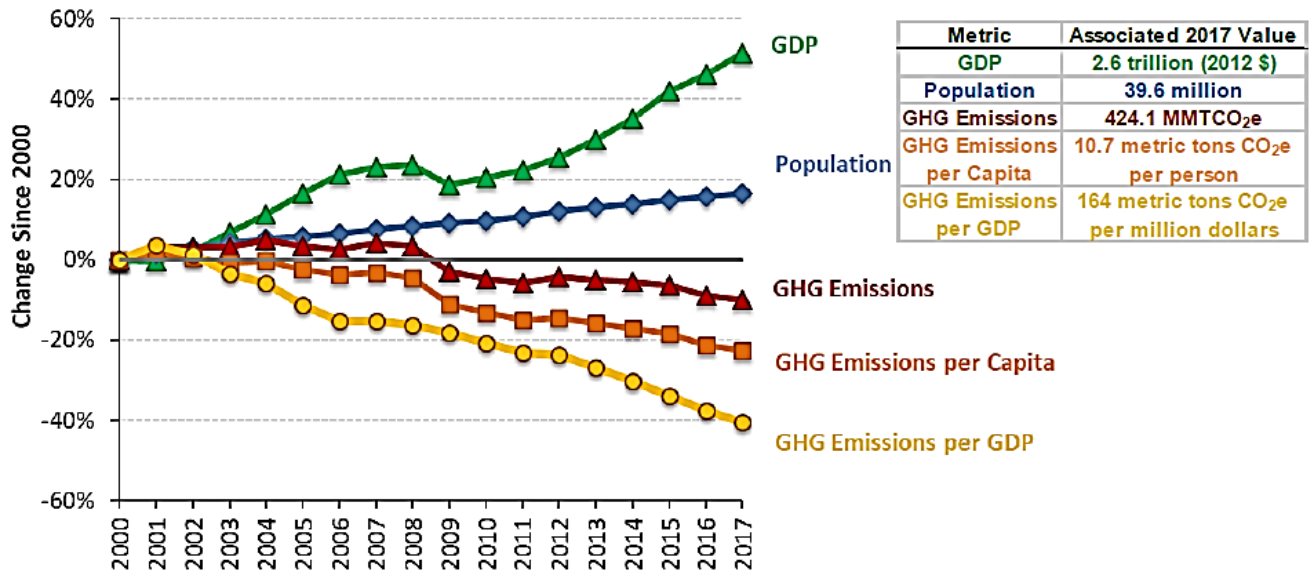


Figure 3.4-3. Change in California GDP, Population, and GHG Emissions since 2000 (Source: CARB 2019c)

AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020, and to update it every 5 years. ARB adopted the first scoping plan in 2008. The second updated plan, California's 2017 Climate Change Scoping Plan, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32. The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions.

3.4.2.3 Regional Plans

ARB sets regional targets for California's 18 MPOs to use in their Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) to plan future projects that will cumulatively achieve GHG reduction goals. Targets are set at a percent reduction of passenger vehicle GHG emissions per person from 2005 levels. The proposed project is included in *Plan Bay Area 2040*, the RTP/SCS for the nine-county Bay Area region. The regional reduction target for MTC/ABAG is 10 percent in 2020 and 19 percent in 2035 (CARB 2019d).

The proposed project is within the jurisdiction of *Plan Bay Area 2040*. Table 3.4-1 provides a summary of GHG reduction policies or strategies from the RTP/SCS and other Climate Action Plans for the project area.

Table 3.4-1. Regional and Local Greenhouse Gas Reduction Plans

Title	GHG Reduction Policies or Strategies
Plan Bay Area 2040	<p>TDM strategies, including bicycle and pedestrian networks, transit, targeted transportation alternatives, trip caps, car sharing, carpool and vanpool incentives, and commuter benefits ordinances.</p> <p>Incorporation of regional Climate Action Program, which includes:</p> <p>Commuter Benefits Program — use of tax incentives to encourage more commuters to walk, bike, take transit, carpool, and vanpool to and from work</p> <p>Smart Driving — conducted two pilot studies to evaluate the impacts of real-time driving in-vehicle devices, smartphone apps and educational outreach on driver behavior and fuel economy</p> <p>Vanpooling — provided online passenger and driver matching, employer outreach, \$500 start-up fee incentives, free bridge tolls and other incentives</p> <p>Car Sharing — expanding car sharing to more communities and exploring all service models, including round trip, one-way and peer-to-peer trips. MTC developed a Bay Area Carsharing Implementation Strategy to guide actions over the next few years</p> <p>Targeted Transportation Alternatives — using campaigns and encouragement programs to change individual travel behavior from driving alone to using sustainable modes, such as walking, biking, riding transit, carpooling, vanpooling and car sharing, for all types of trips</p>
City of Pleasanton Climate Action Plan (adopted February 2012)	<p>Improve and increase transit ridership with incentives, partnerships, and related investments</p> <p>Promote alternatives to work and school commutes</p> <p>Improve traffic flow to relieve congestion</p>
City of Dublin Climate Action Plan (adopted October 2010, updated July 2013)	<p>Work with LAVTA to improve transit</p> <p>Commute Alternative Program (incentives to City employees who use alternatives to solo driving, which include public transportation, biking, walking, or carpooling)</p>
City of San Ramon Climate Action Plan (adopted August 2011)	<p>Transportation Management Associations to implement TDM measures and reduce SOV use in large employment centers</p> <p>Work with other jurisdictions and agencies to coordinate the City's TDM programs with regional plans that are aimed at reducing traffic congestion and improving air quality</p> <p>Promote and encourage public transit, carpool, and vanpool opportunities into San Ramon's business areas including Bishop Ranch, Crow Canyon business area, and the San Ramon Valley Boulevard business area</p>

Title	GHG Reduction Policies or Strategies
	Encourage the use of parking facility designs and parking management to reduce vehicle trips
Alameda County (Unincorporated Areas) Community Climate Action Plan (adopted February 2014)	Conduct a public transit study and implement ridership enhancement programs Enhance rideshare infrastructure and services to increase community participation in this important travel mode

Sources: ABAG and MTC 2017a, MTC 2019, City of Pleasanton 2012b, City of Dublin 2013, City of San Ramon 2011, Alameda County 2014.

3.4.3 Project Analysis

GHG emissions from transportation projects can be divided into those produced during operation of the State Highway System and those produced during construction. The primary GHGs produced by the transportation sector are CO₂, CH₄, N₂O, and HFCs. CO₂ emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of CH₄ and N₂O are emitted during fuel combustion. In addition, a small amount of HFC emissions are included in the transportation sector.

The CEQA Guidelines generally address greenhouse gas emissions as a cumulative impact due to the global nature of climate change (Pub. Resources Code, § 21083(b)(2)). As the California Supreme Court explained, “because of the global scale of climate change, any one project’s contribution is unlikely to be significant by itself.” (Cleveland National Forest Foundation v. San Diego Assn. of Governments (2017) 3 Cal.5th 497, 512.) 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. Although climate change is ultimately a cumulative impact, not every individual project that emits greenhouse gases must necessarily be found to contribute to a significant cumulative impact on the environment.

3.4.3.1 Operational Emissions

CO₂ accounts for 95 percent of transportation GHG emissions in the U.S. The largest sources of transportation-related GHG emissions are passenger cars and light-duty trucks, including sport utility vehicles, pickup trucks, and minivans. These sources account for over half of the emissions from the sector. The remainder of GHG emissions comes from other modes of transportation, including freight trucks, commercial aircraft, ships, boats, and trains, as well as pipelines and lubricants. Because CO₂ emissions represent the greatest percentage of GHG emissions it has been selected as a proxy within the following analysis for potential climate change impacts generally expected to occur.

The highest levels of CO₂ 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 3.4-4). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO₂, may be reduced.

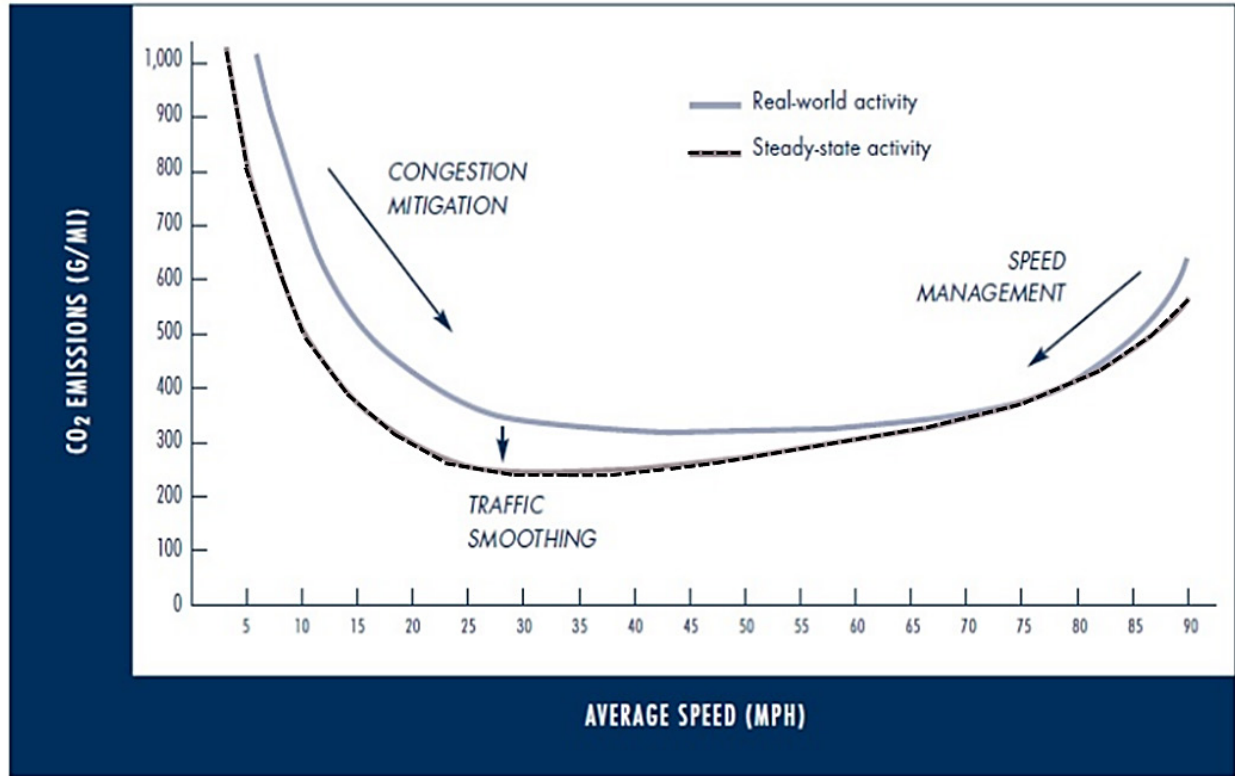


Figure 3.4-4. Possible Use of Traffic Operation Strategies in Reducing On-road CO₂ Emissions
(Source: Barth and Boriboonsomsin 2010)

Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued concurrently.

As described in Section 1.3.2.2, *Plan Bay Area*, the 2013 RTP for the nine-county Bay Area, called for a 550-mile regional network of express lanes to be completed by 2035. The plan included express lanes on I-680 in the project corridor (ABAG and MTC 2013, Map 8). The goals of the regional express lane network included using express lane toll revenue to close gaps within the HOV lane system and to increase travel-time savings for carpools and buses, and optimizing throughput on freeway corridors to better meet current and future traffic demands (ABAG and MTC 2013). In 2014, Alameda County voters passed the Measure BB sales tax, which allocated funding for HOV/express lanes on I-680 from SR 237 to Alcosta Boulevard

The project is included in the current RTP/SCS (*Plan Bay Area 2040*, as amended in 2020), which contains regional strategies for reducing GHG emissions from transportation sources on a regional scale. *Plan Bay Area 2040* outlines measures to reduce per capita VMT, including but not limited to Transportation Demand Management (TDM) strategies such as transit, targeted transportation alternatives, car sharing, carpool and vanpool incentives, and commuter benefits ordinances (ABAG and MTC 2017a). Specifically, *Plan Bay Area 2040* incorporated MTC's Climate Initiatives Program, which is designed to reduce GHG emissions from the transportation

sector with strategies that include financial tools such as tax incentives to encourage more commuters to take transit, carpool, and vanpool; vanpooling setup support; and campaigns and programs to promote using sustainable travel modes, such as riding transit, carpooling, vanpooling and car sharing. Other local jurisdictions in the project area—the Cities of Pleasanton, Dublin, and San Ramon, and Alameda County—have Climate Action Plans with similar policies and strategies aimed at increasing transit ridership, implementing TDM, and promoting alternatives to solo driving such as ridesharing (see Table 3.4-1).

HOV/express lanes are intended to facilitate transit and other alternatives to solo driving. With the Build Alternative, the HOV/express lanes would operate at or above 50 mph during the peak traffic hour in both 2025 and 2045 (Section 2.1.7.2). By providing lanes for transit and other eligible HOVs that would offer shorter travel times than the general-purpose lanes, the Build Alternative would support the regional TDM strategy of reducing vehicle trips and increasing vehicle occupancy through transit use and other alternatives to solo driving. The Build Alternative would also implement systems to increase the efficiency of I-680 including vehicle detection systems to monitor traffic speed and density; and enforcement, incident management, and other subsystems to maintain acceptable traffic flow in the HOV/express lanes.

By helping to provide a continuous HOV/express lane system, the proposed project, combined with other in-progress and proposed HOV/express lane projects, would provide reliable travel times for public transit and help encourage transit use in the corridor. As noted in Section 1.3.2.2, Alameda CTC is working with local and regional transit providers to develop a transit operations concept for potential future public express bus service on I-680, which HOV/express lanes would facilitate.

Quantitative Analysis

A quantitative analysis of daily CO₂ emissions was performed using the Caltrans CT-EMFAC2017 model to compare the potential effects of the project Build and No Build Alternatives. Traffic speed and VMT distributions for existing (2018), opening year (2025), and design year (2045) conditions in the project area were provided by the project traffic consultant (Fehr & Peers 2019). The default fleet mixes and 4 percent truck volumes were used for each model run. The daily emissions reported by the model were multiplied by 365 days to estimate annual emissions and converted from tons to metric tons as summarized in Table 3.4-2.

As shown in Table 3.4-2, the daily CO₂ emissions estimated for both the Build and No Build Alternatives would be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018), because federal and state fuel economy standards are expected to reduce GHG emissions over time. The estimated daily CO₂ emissions for the Build Alternative during the opening year, horizon year, and design year scenarios would be slightly higher (up to 0.3 percent) than the emissions for the No Build Alternative.

However, because the CT-EMFAC2017 model is insensitive to a vehicle's modal events, such as acceleration and deceleration due to traffic congestion, the CO₂ reductions associated with smoother traffic flow under the Build Alternative have not been adequately captured by the model. The Build Alternative would reduce vehicle hours of delay in the traffic study area by 46 percent and 54 percent in 2025 and 2045, respectively, during the AM period; and by 34 percent and 23 percent in 2025 and 2045, respectively, during the PM period (Fehr & Peers 2019). Therefore, the daily CO₂ emissions for the Build Alternative during the opening year, horizon

year, and design year scenarios are likely lower than the No Build Alternative. In conclusion, the Build Alternative is not expected to result in an increase in CO₂ emissions compared to the existing year conditions or the future No Build Alternative.

Table 3.4-2: Operational CO₂ Emissions (metric tons per year)

	2018 Existing	2025 No Build	2025 Build	2040 No Build^B	2040 Build^B	2045 No Build	2045 Build
Daily VMT	10,364,176	11,256,688	11,273,540	13,806,722	13,871,722	13,806,722	13,871,722
Peak VHD ^A	17,270	13,630	7,860	101,000	62,500	101,000	62,500
Carbon Dioxide	1,316,200	1,173,600	1,174,800	1,149,100	1,152,700	1,129,200	1,132,700

Source: Fehr & Peers 2019.

Notes: VMT = vehicle miles traveled; VHD = vehicle hours of delay

^A Delay is calculated relative to 65 mph on freeways. Peak Period represents 15 hours from 5:00 AM to 1:00 PM and 2:00 PM to 9:00 PM.

^B Traffic data for the design year (2045) was used to conservatively estimate emissions during the horizon year (2040).

While CT-EMFAC has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its GHG emission rates are based on tailpipe emission test data.¹⁷

Moreover, the model does not account for factors such as the rate of acceleration and vehicle aerodynamics, which influence the amount of emissions generated by a vehicle. GHG emissions quantified using CT-EMFAC are therefore estimates and may not reflect actual physical emissions. Though CT-EMFAC is currently the best available tool for calculating GHG emissions from mobile sources, it is important to note that the GHG results are only useful for a comparison among alternatives.

3.4.3.2 Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and 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.

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 offset to some degree by longer intervals between maintenance and rehabilitation activities.

¹⁷ This analysis does not currently account for the effects of the US National Highway Traffic Safety Administration and Environmental Protection Agency SAFE (Safer Affordable Fuel-Efficient) Vehicles Rule. Part One revoking California's authority to set its own greenhouse gas emissions standards was published on September 27, 2019 and effective November 26, 2019. The SAFE Vehicles Rule Part 2 would amend existing Corporate Average Fuel Economy (CAFE) and tailpipe carbon dioxide emissions standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026. The proposal would retain the model year 2020 standards for both programs through model year 2026. No adjustment factors have been developed for carbon dioxide. Modeling these estimates with EMFAC or CT-EMFAC remains the most precise means of estimating future greenhouse gas emissions.

Emissions of CO₂e during project construction were quantified for each build scenario using Road Construction Emissions Model Version 8.1.0 to support CEQA review of the project.

The total CO₂e emissions and annual average CO₂e emissions estimated for construction of the Build Alternative are summarized in Table 3.4-3. Project construction would result in GHG emissions that would be offset by the long-term improvement in operational GHG emissions compared with the No-Build Alternative (see Section 3.4.3.1).

Table 3.4-3: Construction CO₂e Emissions

	CO₂e (Total Metric Tons)	CO₂e (Annual Average Metric Tons)
Construction Emissions	4,877	1,829

The project would implement measures to reduce construction emissions, such as maintenance of construction equipment and vehicles, limiting of construction vehicle idling time, and scheduling and routing of construction traffic, as outlined in Section 2.2.5.3. These measures would also reduce construction-related GHG emissions.

3.4.3.3 CEQA Conclusion

CEQA Guidelines Section 15064.4 states that, among other factors, a lead agency should consider the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting when assessing the significance of impacts from GHG emissions on the environment. While the comparison of future Build to future No Build conditions may be useful in aiding the analysis of significance and in determining the extent of project-level measures to reduce GHG emissions due to the project, CEQA and the CEQA Guidelines remain focused on the comparison of future conditions with the project compared to existing conditions.

EO B-30-15 (April 2015) established an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 in order to ensure that California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050, as required by EO S-3-05. These goals have been taken into consideration in the determination of the potential impacts related to GHG emissions that may result from the implementation of the proposed project.

While individual projects are not required to meet the 2050 reduction targets, current professional CEQA practices and important court cases¹⁸ in 2014 and 2015 advocate for demonstrating continued progress toward assisting the State in achieving these goals.

The following criteria have been applied in consideration of whether this proposed project would result in significant impacts related to GHG emissions:

Would the project result in a net increase in direct and indirect GHG emissions by 2040 when compared to existing conditions?

¹⁸ Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming (2015) 224 Cal.App.4th 1105 (CBD vs. CDFW; also known as the "Newhall Ranch" case; Cleveland National Forest Foundation v. San Diego Association of Governments, 180 Cal.Rptr.3d 548 (Cal. Ct. App. 2014)

As shown in Table 3.4-2, the daily CO₂ emissions estimated for both the Build and No Build Alternatives would be lower in the opening year (2025), horizon year (2040), and design year (2045) compared to the existing year (2018). Future Build emissions are greater than future No Build emissions. There is still evidence of substantial progress in reducing emissions because there is a reduction in future emissions with the project compared to existing emissions. The impact is considered Less Than Significant.

Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The following analysis provides a basis for determining whether the proposed project would conflict with plans, policies, and regulations adopted for the purposes of reducing GHG emissions.

Locally Adopted Climate Action Plans. The new HOV/express lanes would pass through the cities of Pleasanton, Dublin, and San Ramon, and in the area south of Pleasanton, unincorporated Alameda County. Each of these jurisdictions have adopted Climate Action Plans (CAPs) (City of Pleasanton 2012b; City of Dublin 2013; City of San Ramon 2015; Alameda County 2010, 2014). The CAPs include a wide variety of strategies and measures to reduce GHG-related emissions from transportation sources, and all CAPs specifically encourage transit ridership and alternatives to solo driving (see Table 3.4-1). The proposed project would construct express lanes that would serve transit and other HOVs and would therefore be consistent with local CAPs that encourage or prioritize transit ridership and alternatives to solo driving. The proposed HOV/express lanes would also result in travel time savings for HOVs, as described in Section 2.1.7.2.

SB 375. To demonstrate consistency with SB 375, a project must be included in the current version of an RTP and must identify and implement any applicable GHG reduction measures listed in the EIR prepared in support of the current RTP.

As stated previously, the proposed project is included in the current RTP, *Plan Bay Area 2040*, and will incorporate the following measure identified in the EIR for that plan, which would support GHG reduction:

- TDM strategies shall be incorporated into individual land use and transportation projects and plans, as part of the planning process.

The Build Alternative would incorporate TDM strategies such as using roadway pricing and providing lanes that encourage bus and other eligible HOV use. In addition, the Build Alternative would require data collection to determine the effectiveness of TDM strategies over time. Specifically, the operator would collect data on lane usage to verify compliance with 23 USC 166, which requires HOV lanes to maintain a minimum average operating speed of 45 mph, as discussed in Section 1.3.2.2. These strategies are consistent with *Plan Bay Area 2040*.

EO S-3-05/AB 32. EO S-3-05 established a target of reducing GHG emissions to (1) 2000 levels by 2010, (2) 1990 levels by 2020 (codified by AB 32), and (3) 80 percent below 1990 levels by 2050. Strategies to achieve these statewide targets are outlined in the CARB Climate Change Scoping Plan (required by AB 32), a high-level statewide strategy approach not intended for application to individual projects independently. Although no single project is expected to

achieve the reduction targets alone, the projected GHG emissions results (as shown in Table 3.4-2) have been considered to determine whether the project will support continued progress toward these goals. According to CARB's First Update to the Scoping Plan, California is on track to meet the near-term 2020 GHG limit and is well positioned to maintain and continue reductions beyond 2020. Therefore, this discussion is limited to determining if the proposed project would conflict with the Scoping Plan and the 2050 emissions target.

Caltrans is an active partner along with other state agencies and sectors in implementing the goals and objectives of the Scoping Plan through Department-wide policies, strategic management plans, and goals and objectives related to GHG emissions reduction. Caltrans activities to reduce GHG emissions are described in Section 3.4.4.2. This project would not affect any of those activities. In addition, the project would use transportation pricing policies, which have been identified in the Scoping Plan as a methodology to reduce GHG emissions. The proposed project would not conflict with broad statewide transportation goals identified in the 2017 Scoping Plan required by AB 32.

Future GHG emissions with the Build Alternative would be lower for the Design Year 2045 compared to Existing Year (as shown in Table 3.4-2). Based on the above, the project would align with policies to keep the state on a trajectory for progress toward the 2050 emission reduction target. The project would not conflict with transportation goals identified in the CARB Scoping Plan and would be consistent with GHG reduction strategies identified in the Scoping Plan, as discussed above. Therefore, the proposed project would not conflict with EO S-3-05.

EO B-30-15/SB 32. Among other provisions, this EO established a midrange GHG emission reduction target of 40 percent below 1990 levels by 2030. Compared to the Existing Year, GHG emissions with both the Build and No Build Alternatives would be lower in Opening Year 2025. Since the proposed project would result in a reduction in GHG emissions for Opening Year 2025 compared to the Existing Year (as shown in Table 3.4-2), the project would align with policies to keep the state on a trajectory for progress toward the 2030 emission reduction target.

The project would not affect the state's consideration of climate change in planning and investment decisions and in the Five-Year Infrastructure Plan, establishment of a technical advisory group, or continuation of the state's climate change research program. Therefore, the project would not affect the state's ability to achieve the provisions of EO B-30-15, and would not conflict with EO B-30-15/SB 32.

This impact based on Significance Criterion 2 would be considered Less Than Significant.

3.4.4 Greenhouse Gas Reduction Strategies

3.4.4.1 Statewide Efforts

Major sectors of the California economy, including transportation, will need to reduce emissions to meet the 2030 and 2050 GHG emissions targets. Former Governor Edmund G. Brown promoted GHG reduction goals that involved (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farms and rangelands, forests, and

wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, Safeguarding California.

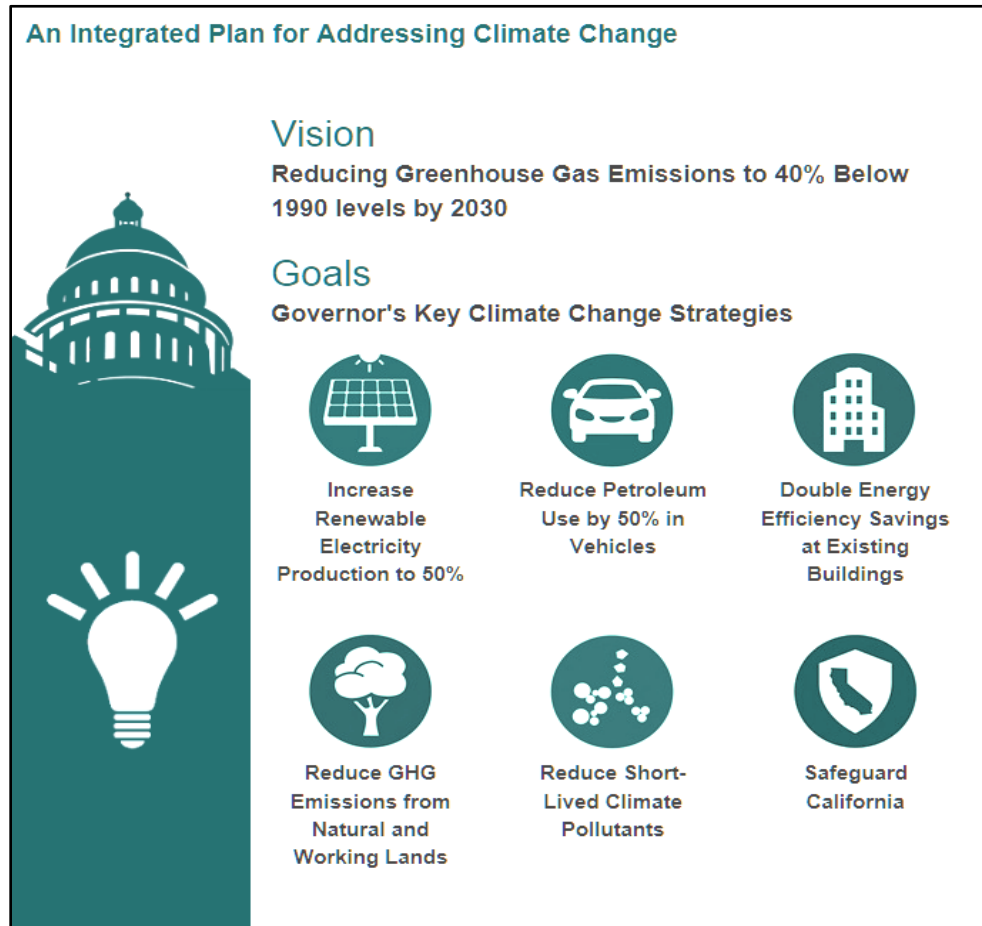


Figure 3.4-5: California Climate Strategy

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that the state build on past successes in reducing criteria and toxic air pollutants from transportation and goods movement. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled (VMT). A key state goal for reducing greenhouse gas emissions is to reduce today's petroleum use in cars and trucks by up to 50 percent by 2030 (State of California 2019).

In addition, SB 1386 (Wolk 2016) established as state policy the protection and management of natural and working lands and requires state agencies to consider that policy in their own decision making. Trees and vegetation on forests, rangelands, farms, and wetlands remove carbon dioxide from the atmosphere through biological processes and sequester the carbon in above- and below-ground matter.

3.4.4.2 Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the CARB works to implement Eos S-3-05 and S-01-07 and help achieve the targets set forth in AB 32.

EO B-30-15, issued in April 2015, and SB 32 (2016), set an interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. In 2016, Caltrans completed the California Transportation Plan 2040, which establishes a new model for developing ground transportation systems, consistent with CO₂ reduction goals. It serves as an umbrella document for all the other statewide transportation planning documents. Over the next 25 years, California will be working to improve transit and reduce long-run repair and maintenance costs of roadways and developing a comprehensive assessment of climate-related transportation demand management and new technologies rather than continuing to expand capacity on existing roadways. SB 391 (Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans' Strategic Management Plan

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of nonauto mode share
- Reducing VMT
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several sustainable transportation planning grants. These grants encourage local and regional multimodal transportation, housing, and land use planning that furthers the region's RTP/SCS; contribute to the State's GHG reduction targets and advance transportation-related GHG emission reduction project types/strategies; and support other climate adaptation goals (e.g., Safeguarding California).

Caltrans Policy Directives and Other Initiatives

Caltrans' Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of Caltrans' statewide activities to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies

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

I-680 in the project area is part of the regional HOV lane network, and MTC and other agencies actively encourage ridesharing (e.g., the "511.org" ridesharing information link provides resources for ride sharing and trip planning). The project's express lanes would encourage and support ridesharing, carpooling, and transit use, to reduce vehicle trips and their associated GHG emissions. In addition to the express lanes, the proposed project includes the following components that would serve to limit GHG emissions:

1. The project's intelligent transportation system features will help manage traffic by monitoring traffic speed and density. Enforcement, incident management, and other systems will be used to help manage and maintain traffic operations. Electronic detection systems will respond to changing speed and traffic conditions, and automated signage will keep drivers informed of dynamic toll rates.
2. Caltrans Standard Specifications such as Section 14-9.02, Air Pollution Control, require contractors to comply with all federal, state, and local air pollution control rules, regulations, and ordinances. Requirements such as idling restrictions and keeping engines properly tuned reduce emissions, including GHG emissions.
3. As noted in Section 1.4.1.5, a TMP will be prepared during the design phase of the project to minimize traffic disruptions from project construction. Minimizing traffic delays during construction will help reduce GHG emissions from idling vehicles.

Per Caltrans standards for energy efficient roadway lighting, the project will utilize energy efficient LED lighting fixtures.

3.4.5 Adaptation

Reducing GHG emissions is only one part of an approach to addressing climate change. Caltrans must 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 their intensity, and in the frequency and intensity of wildfires. Flooding and erosion can damage or wash out roads; longer periods of intense heat can buckle pavement and railroad tracks; storm surges combined with a rising sea level can inundate highways. Wildfire can directly burn facilities and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained.

3.4.5.1 Federal Efforts

Under NEPA assignment, Caltrans is obligated to comply with all applicable federal environmental laws and FHWA NEPA regulations, policies, and guidance.

The U.S. Global Change Research Program (USGCRP) delivers a report to Congress and the president every 4 years, in accordance with the Global Change Research Act of 1990 (15 U.S.C. ch. 56A § 2921 et seq). The Fourth National Climate Assessment, published in 2018, presents the foundational science and the “human welfare, societal, and environmental elements of climate change and variability for 10 regions and 18 national topics, with particular attention paid to observed and projected risks, impacts, consideration of risk reduction, and implications under different mitigation pathways.” Chapter 12, “Transportation,” presents a key discussion of vulnerability assessments. It notes that “asset owners and operators have increasingly conducted more focused studies of particular assets that consider multiple climate hazards and scenarios in the context of asset-specific information, such as design lifetime” (USGCRP 2018).

The U.S. DOT Policy Statement on Climate Adaptation in June 2011 committed the federal Department of Transportation to “integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely, and that transportation infrastructure, services and operations remain effective in current and future climate conditions” (U.S. DOT 2011).

FHWA order 5520 (Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events, December 15, 2014) established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. FHWA has developed guidance and tools for transportation planning that foster resilience to climate effects and sustainability at the federal, state, and local levels (FHWA 2019).

3.4.5.2 State Efforts

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. California’s Fourth Climate Change Assessment (2018) is the state’s effort to “translate the state of climate science into useful information for action” in a variety of sectors at both statewide and local scales. It adopts the following key terms used widely in climate change analysis and policy documents:

- *Adaptation* to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
- *Adaptive capacity* is the “combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities.”
- *Exposure* is the presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.

- *Resilience* is the “capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience”. Adaptation actions contribute to increasing resilience, which is a desired outcome or state of being.
- *Sensitivity* is the level to which a species, natural system, or community, government, etc., would be affected by changing climate conditions.
- *Vulnerability* is the “susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt.” Vulnerability can increase because of physical (built and environmental), social, political, and/or economic factor(s). These factors include, but are not limited to: ethnicity, class, sexual orientation and identification, national origin, and income inequality.² Vulnerability is often defined as the combination of sensitivity and adaptive capacity as affected by the level of exposure to changing climate.

Several key state policies have guided climate change adaptation efforts to date. Recent state publications produced in response to these policies draw on these definitions.

EO S-13-08, issued by then-governor Arnold Schwarzenegger in November 2008, focused on sea-level rise and resulted in the *California Climate Adaptation Strategy* (2009), updated in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan). The Safeguarding California Plan offers policy principles and recommendations and continues to be revised and augmented with sector-specific adaptation strategies, ongoing actions, and next steps for agencies.

EO S-13-08 also led to the publication of a series of sea-level rise assessment reports and associated guidance and policies. These reports formed the foundation of an interim *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance) in 2010, with instructions for how state agencies could incorporate “sea-level rise (SLR) projections into planning and decision making for projects in California” in a consistent way across agencies. The guidance was revised and augmented in 2013. *Rising Seas in California – An Update on Sea-Level Rise Science* was published in 2017 and its updated projections of sea-level rise and new understanding of processes and potential impacts in California were incorporated into the *State of California Sea-Level Rise Guidance Update* in 2018.

EO B-30-15, signed in April 2015, requires state agencies to factor climate change into all planning and investment decisions. This EO recognizes that effects of climate change other than sea-level rise also threaten California’s infrastructure. At the direction of EO B-30-15, the Office of Planning and Research published *Planning and Investing for a Resilient California: A Guidebook for State Agencies* in 2017, to encourage a uniform and systematic approach. Representatives of Caltrans participated in the multi-agency, multidisciplinary technical advisory group that developed this guidance on how to integrate climate change into planning and investment.

AB 2800 (Quirk 2016) created the multidisciplinary Climate-Safe Infrastructure Working Group, which in 2018 released its report, *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California*. The report provides guidance to agencies on how to address the challenges of assessing risk in the face of inherent uncertainties still posed by the best available

science on climate change. It also examines how state agencies can use infrastructure planning, design, and implementation processes to address the observed and anticipated climate change impacts.

3.4.5.3 Caltrans Adaptation Efforts

Caltrans Vulnerability Assessments

Caltrans is conducting climate change vulnerability assessments to identify segments of the State Highway System vulnerable to climate change effects including precipitation, temperature, wildfire, storm surge, and sea-level rise. The approach to the vulnerability assessments was tailored to the practices of a transportation agency, and involves the following concepts and actions:

- *Exposure* – Identify Caltrans assets exposed to damage or reduced service life from expected future conditions.
- *Consequence* – Determine what might occur to system assets in terms of loss of use or costs of repair.
- *Prioritization* – Develop a method for making capital programming decisions to address identified risks, including considerations of system use and/or timing of expected exposure.

The climate change data in the assessments were developed in coordination with climate change scientists and experts at federal, state, and regional organizations at the forefront of climate science. The findings of the vulnerability assessments will guide analysis of at-risk assets and development of adaptation plans to reduce the likelihood of damage to the State Highway System, allowing Caltrans to both reduce the costs of storm damage and to provide and maintain transportation that meets the needs of all Californians.

3.4.5.4 Project Adaptation Analysis

The January 2018 *Caltrans Climate Change Vulnerability Assessments* for the District 4 region (Caltrans 2018b), which covers the nine-county San Francisco Bay Area, was consulted regarding climate stressors in the project area. The report and accompanying Climate Change Vulnerability Assessment map tool (Caltrans 2017) identified the following climate change conditions for the project area for the analysis years 2025, 2055, and 2085.

Sea Level Rise

The proposed project is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected.

Floodplains

According to the Climate Change Vulnerability Assessment map tool, the 100-year precipitation depth for I-680 in the project limits is anticipated to increase by approximately 3.5 percent in 2025, 5 percent in 2055, and 4 percent in 2085 (Caltrans 2017). Eleven areas of the project are within FEMA-delineated floodplains, as described in Section 2.2.1.2. The Build Alternative proposes no work at bridges over waterway crossings that are within floodplains. Culverts in

serviceable condition would be extended to address the proposed widening and to maintain existing drainage patterns, while undersized culverts would be replaced with larger sizes (i.e., any culvert under 16 inches in diameter will be enlarged to at least 16 inches, and to over 24 inches where space allows; Measure BIO-5, Section 2.3.1.3).

Climate change risk analysis involves uncertainties about the timing and intensity of potential risks. Detailed engineering analyses would be required to determine if proposed culverts and other drainage facilities would accommodate climate change-related increases in rainfall intensity. Detailed drainage design is conducted during the PS&E phase. At that time, projected precipitation changes would be considered, and adaptive measures would be implemented if needed based on guidance from Caltrans Hydraulics.

The project is not anticipated to exacerbate the effects of climate change in terms of precipitation depth.

Wildfire

I-680 in the project limits is not identified as an area subject to increased wildfire risk for the analysis years 2025, 2055, or 2085 (Caltrans 2017, 2018).¹⁹ However, the southern portion of the project area (south of Happy Valley Road) is designated as a State Responsibility Area, where the State of California is financially responsible for the prevention and suppression of wildfires, and the project is adjacent to land classified as a very high fire hazard severity zone. Potential wildfire impacts from the project are described in Section 3.3.3. The project is not anticipated to exacerbate the effects of climate change in terms of wildfire.

¹⁹ The Cal Fire mapping discussed in Section 3.3 depicts fire hazard at the time of map approval. The *District 4 Climate Change Vulnerability Assessment* describes increased wildfire risk for the future analysis years of 2025, 2055, and 2085. Although Cal Fire mapping characterizes sections of the project area as very high or high fire hazard severity zones, the future year vulnerability assessment does not indicate an additional future increase in wildfire risk for any sections of the project area.

Chapter 4 Comments and Coordination

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization, and/or mitigation measures and related environmental requirements. Agency and tribal consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including interagency coordination meetings, public meetings, public notices, and PDT meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

4.1 Public Participation

Caltrans held three public information meetings at the outset of the environmental studies for the proposed project. The purpose of the meetings was to inform the public about the project and solicit community input on the issues to be addressed in the environmental document.

The meetings were noticed through newspaper advertisements that ran on October 3 and 10, 2018, in the *East Bay Times*, covering Alamo, Oakland, Hayward, Fremont, Walnut Creek, Brentwood, Martinez, Danville, Blackhawk, San Ramon, Dublin, Pleasanton, Livermore, and Sunol. Advertisements also ran in the online version of the *East Bay Times*. In addition, meeting notices were mailed to approximately 2,500 addresses within 0.25 mile of the project area, along with approximately 200 other agency and local stakeholders. Caltrans also mailed invitations to elected officials that represent the project area.

Locations, dates, and times of the meetings were as follows:

- Dublin Civic Center, Regional Room, Dublin, CA, on Tuesday, October 9, 2018, 6 to 8 PM
- Sunol Glen Elementary, Auditorium, Sunol, CA, on Tuesday, October 16, 2018, 6 to 8 PM
- Lydiksen Elementary School, Multi-Purpose Room, Pleasanton, CA, on Thursday, October 18, 2018, 6 to 8 PM

Approximately 10 members of the public in total attended the meetings.

The meetings were an open house format in which attendees could view informational exhibits and ask questions of the project team. Attendees were encouraged to submit comments in writing, either during the meeting, via postal mail or email, or via the Alameda CTC project web page, which has a link to an online comment form.

Meeting attendee questions and comments involved existing noise and traffic in the project area, potential traffic impacts during project construction, express lane enforcement and operation, and the existing express lanes to the north of the project area on I-680 in Contra Costa County. Comments about noise were considered in the development of measurement and modeling locations for the project's noise analysis (Section 2.2.6).

Additional public outreach will take place during the circulation period of the Draft IS/EA. During the public review period for the Draft IS/EA, the public will have a minimum of 30 days to comment on the document. Additional public meetings will be held approximately midway through the review period.

4.2 Consultation and Coordination with Public Agencies

4.2.1 Federal Agencies

Federal Highway Administration

After public circulation of this IS/EA, the project's air quality studies will be submitted to FHWA for a project-level conformity determination.

NOAA Fisheries

A NOAA Fisheries species list was created for the project and was mostly recently updated on January 13, 2020 (Appendix C). Consultation with NOAA Fisheries under Section 7 of FESA is not anticipated because the project will not affect any listed species that fall within NOAA Fisheries jurisdiction, as described in Section 2.3.5.2.

U.S. Army Corps of Engineers

The proposed project will affect waters of the U.S. as defined in Section 404 of the CWA, as described in Section 2.3.2.3. A preliminary jurisdictional wetland delineation has been prepared and was submitted to the USACE on November 18, 2019. USACE issued a preliminary jurisdictional delineation on April 7, 2020. A permit application will be submitted to the USACE during the detailed design phase.

U.S. Fish and Wildlife Service

A USFWS species list was created for the project on June 4, 2018, most recently updated on November 19, 2019 (Appendix C), and used to identify target species for reconnaissance-level surveys for terrestrial plants and animals. The project will require consultation with the USFWS under Section 7 of FESA. A Biological Assessment for the project was submitted to the USFWS on November 15, 2019, to initiate consultation under Section 7.

4.2.2 Tribal Entities

The NAHC was contacted on April 27, 2018, to request a search of the Sacred Lands File for cultural resources of significance to Native Americans within or near the APE. The NAHC replied on May 16, 2018, providing a list of tribes with traditional lands or cultural places located within Alameda County.

Native American consultation is described in further detail in Section 2.1.9.2.

4.2.3 State Agencies

California Department of Fish and Wildlife

The project has the potential to affect state-listed species, as described in Section 2.3.5.3. A request for a Consistency Determination or Incidental Take Permit for California tiger

salamander will be submitted to the CDFW under Section 2081(b) of the CESA during the detailed design phase.

A Section 1600 Lake or Streambed Alteration Agreement with CDFW is necessary when a project would alter the flow, bed, channel, or bank of a stream or lake. A 1600 permit application will be submitted to the CDFW during the detailed design phase.

4.2.4 Regional Agencies

Metropolitan Transportation Commission

The project team initiated consultation with the Bay Area Air Quality Conformity Task Force by submitting a Project Assessment Form for PM_{2.5} Interagency Consultation. On March 1, 2019, the Task Force determined that the project is not a project of air quality concern.

Public comment is requested regarding the Task Force's determination (see Appendix C). Following the close of the public review and comment period for the IS/EA, all comments received on the air quality conformity determination will be included in an air quality conformity report to be submitted to FHWA. The final determination on project-level conformity will be made by FHWA.

San Francisco Bay Regional Water Quality Control Board

Project construction could affect waters of the United States. Pursuant to Section 401 of the CWA, a Notice of Intent will be submitted to the RWQCB. The project would implement any general WDRs issued by the RWQCB.

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

Public input on the project will be solicited during the review period for this IS/EA, which will last a minimum of 30 days. The public will be notified of the availability of the IS/EA by a number of methods, including postings on the Caltrans and Alameda CTC websites and a mailed announcement to interested agencies and individuals. During the review period, Caltrans and Alameda CTC will hold a public meeting to share information about the project and collect comments on the IS/EA from interested parties. The review period and instructions for submitting comments are included on the first page of this document. All formal comments will be addressed and responses published in the Final IS/EA. If the Final IS/EA is approved, an MND and a Finding of No Significant Impact will be signed and included with the Final IS/EA.

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Chapter 6 Distribution List

The following agencies, organizations, and individuals received printed or electronic copies of this document. Agency names marked with an asterisk (*) received copies through the State Clearinghouse.

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Environmental Protection Agency,
Region IX
Federal Activities Office, CMD-2
75 Hawthorne Street
San Francisco, CA 94105-3901

Natural Resources Conservation Service
Area I
2 Sutter Street, Suite C
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National Marine Fisheries Service
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Federal Highway Administration
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Attn: Richard Corey
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California Department of Conservation*
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California Department of Fish & Wildlife*
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2825 Cordelia Road, Suite 100
Fairfield, CA 94534

California Highway Patrol*
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4999 Gleason Drive
Dublin, CA 94568

State Historic Preservation Officer*
Office of Historic Preservation
1725 23rd Street, Suite 100
Sacramento, CA 95816

California Public Utilities Commission*
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505 Van Ness Avenue
San Francisco, CA 94102

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P.O. Box 942896
Sacramento, CA 94296

California Department of Water Resources
Central Valley Flood Protection Board
3310 El Camino Avenue, Suite 170
Sacramento, CA 95821

California Department of Water Resources*
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California Resources Agency*
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California Department of General Services
Environmental Services Section
707 Third Street, Eighth Floor
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California Department of Resources
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1001 I Street
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Division of Water Quality
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Sacramento, CA 95812

California Department of Toxic Substances
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Director
1001 I Street
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California Energy Commission
1516 Ninth Street, MS-29
Sacramento, CA 95814

Native American Heritage Commission*
1550 Harbor Blvd., Suite 100 West
Sacramento, CA 95691

California State Lands Commission
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825

Regional Agencies

Association of Bay Area Governments
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Bay Area Metro Center
375 Beale Street, Suite 800
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Bay Area Air Quality Management District
Attn: Jack Broadbent
375 Beale Street, Suite 600
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Metropolitan Transportation Commission
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Regional Water Quality Control Board*
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Attn: Dale Bowyer
1515 Clay Street, Suite 1400
Oakland, CA 94612

East Bay Regional Park District
Attn: Robert Doyle
2950 Peralta Oaks Court
Oakland, CA 94605

San Francisco Public Utilities Commission
525 Golden Gate Avenue, 10th Floor
San Francisco, CA 94102

San Francisco Public Utilities Commission
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1657 Rollins Road
Burlingame, CA 94010

Pacific Locomotive Association
Attn: Donna Alexander
Niles Canyon Railway
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Sunol, CA 94586

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Oakland, CA 94612

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399 Elmhurst Street
Hayward, CA 94544

Alameda County Planning Commission
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Hayward, CA 94544

Alameda County Planning Commission
Attn: Alameda County Parks, Recreation,
and Historic Commission
224 West Winton, Room 111
Hayward, CA 94544

Alameda County Planning Commission
Attn: Sunol Citizens Advisory Committee
224 West Winton, Room 111
Hayward, CA 94544

Alameda County Water District
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Elected Officials

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Congressman, District 11
United States Congress

3100 Oak Road, Suite 110
Walnut Creek, CA 94597

The Honorable Eric Swalwell
Congressman, District 15
United States Congress
3615 Castro Valley Boulevard
Castro Valley, CA 94546

The Honorable Ro Khanna
Congressman, District 17
United States Congress
900 Lafayette Street, Suite 206
Santa Clara, CA 95050

The Honorable Kamala Harris
Senator
United States Senate
333 Bush Street, Suite 3225
San Francisco, CA 94104

The Honorable Dianne Feinstein
Senator
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The Honorable Catharine Baker
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The Honorable Kansen Chu
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Other Stakeholders

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Chapter 7 References

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- Zone 7 Water Agency. 2005. Groundwater Management Plan for Livermore-Amador Valley Groundwater Basin. URL: http://www.zone7water.com/images/pdf_docs/groundwater/gw-mgmt-plan_2005.pdf?sm_au=iVV25DZTrQFRZnRF. Accessed September 13, 2018.

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Appendix A. Resources Evaluated Relative to the Requirements of Section 4(f): No-Use Determination(s)

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 United States Code (USC) 303, declares that “it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

This section of the document discusses parks, recreational facilities, wildlife refuges, and historic properties found within or next to the project area that do not trigger Section 4(f) protection because: 1) they are not publicly owned, 2) they are not open to the public, 3) they are not eligible historic properties, or 4) the project does not permanently use the property and does not hinder the preservation of the property.

Parks and Recreation Areas

The following publicly owned parks and recreation areas are within the Section 4(f) study area, which is a 0.25-mile radius from the project:

- Boone Acres Park, San Ramon
- Kolb Park, Dublin
- Dublin Sports Grounds, Dublin
- Dublin Elementary School, Dublin
- Centennial Trail, Pleasanton
- Muirwood Community Park, Pleasanton
- Val Vista Park, Pleasanton
- Oak Hill Park, Pleasanton
- Del Prado Park, Pleasanton
- Meadowlark Park, Pleasanton
- Fawn Hills Park, Pleasanton
- Pleasanton Ridge Regional Park, Alameda County

These facilities are described further in Section 2.1.3.2, Table 2.1.3-1.

The project would not require the permanent use of any publicly owned park or recreational facility, as the project would not acquire any property outside of the state ROW. If visible following project construction, the HOV/express lanes, signage, and lighting would be visually consistent with the existing freeway infrastructure and would not affect park or trail use.

Construction activities would not require TCEs from, or closure, alteration, or other use of, the facilities listed above. Recreationists on the Centennial Trail could be exposed to short-term,

temporary noise and views of project construction, depending on the location and nature of construction activities (described further in Section 2.2.6.3 under “Short-Term Noise Changes” and Section 2.1.8.3 under “Temporary Construction Visual Impacts”). The trail is primarily used for transportation, there are no benches or other fixed amenities on the trail segment along I-680 that would encourage trail users to linger, and the trail is currently exposed to the sights and sounds of vehicular traffic on I-680 to the west. As Centennial Trail is primarily used for transportation, the requirements of Section 4(f) do not apply.

The remaining parks and recreation facilities adjacent to I-680 are separated by sound walls or vegetated berms, which would provide shielding from views, sounds, and smells of construction activities. Project construction is not expected to affect the use of any park or recreation facility.

These properties are Section 4(f) properties, but no “use” will occur. Therefore, the provisions of Section 4(f) do not apply.

Historic Properties

One historic property has been identified within the Area of Potential Effects (APE) as determined by Caltrans under the January 2014 *First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act* (Section 106 PA).

The property is an archaeological site that was determined eligible for the NRHP on December 27, 1999. The finding is anticipated to be a Finding of No Adverse Effect with Standard Conditions–ESA. The site, however, is not considered a Section 4(f) resource because it is an archaeological site eligible primarily under Criterion D, its potential to contain data important to the understanding of prehistory, and has minimal value for preservation in place.

Appendix B. Title VI Policy Statement

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY

Gavin Newsom, Governor

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE DIRECTOR
P.O. BOX 942873, MS-49
SACRAMENTO, CA 94273-0001
PHONE (916) 654-6130
FAX (916) 653-5776
TTY 711
www.dot.ca.gov



Making Conservation
a California Way of Life.

November 2019

NON-DISCRIMINATION POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964, ensures *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."*

Related federal statutes, remedies, and state law further those protections to include sex, disability, religion, sexual orientation, and age.

For information or guidance on how to file a complaint, or obtain more information regarding Title VI, please contact the Title VI Branch Manager at (916) 324-8379 or visit the following web page:
<https://dot.ca.gov/programs/business-and-economic-opportunity/title-vi>.

To obtain this information in an alternate format such as Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, at 1823 14th Street, MS-79, Sacramento, CA 95811; (916) 324-8379 (TTY 711); or at Title.VI@dot.ca.gov.

A blue ink signature of Toks Omishakin, consisting of a stylized 'T' followed by a series of loops and a horizontal line.

Toks Omishakin
Director

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

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Appendix C. Consultation and Coordination

This appendix includes the following consultation and correspondence regarding the proposed project.

- PM_{2.5} Interagency Consultation Summary and MTC Air Quality Conformity Task Force determination that the project is not a Project of Air Quality Concern.
- USFWS and NOAA Fisheries species list.

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**PM2.5 Interagency Consultation Summary and
MTC Air Quality Conformity Task Force Determination**

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Summary of Project Assessment for PM_{2.5} Interagency Consultation for I-680 Express Lanes from SR 84 to Alcosta Boulevard Project

The proposed project is located in the San Francisco Bay Area Air Basin, which does not attain the National Ambient Air Quality Standards for particulate matter of 2.5 micrometers and smaller (PM_{2.5}). Therefore, the proposed project and other federally funded projects are required to undergo a screening process set forth by the United States Environmental Protection Agency (USEPA) Final Conformity Rule EPA-420-F-10-011 (71 Federal Register 12468). This process was established to protect public health with a margin of safety. The process involves interagency consultation, facilitated through the Metropolitan Transportation Commission's (MTC's) Air Quality Conformity Task Force, regarding whether a project meets specific criteria defined in Title 40 Code of Federal Regulations (CFR) Part 93 for Projects of Air Quality Concern.

On March 1, 2019, the Air Quality Conformity Task Force determined that the proposed project is not a Project of Air Quality Concern (POAQC) as defined by 40 CFR 93.123(b)(1). Therefore, a detailed PM_{2.5} hot-spot analysis is not required for the project.

The proposed project is not a POAQC based on the following:

- The project would not expand/increase capacity for diesel vehicles; large trucks are restricted from using HOV/express lanes by California Vehicle Code Section 21655(b). The truck percentage would be 4 percent with and without project.
- The project would not increase the number of diesel vehicles in the project area or result in land use changes that would attract more diesel vehicles.
- The project would reduce peak-period vehicle hours of delay compared to the No Build Alternative.

Meeting notes from the February 28, 2019, Air Quality Conformity Task Force meeting follow.

McIntyre, Lynn

From: Fund Management System <fms@bayareametro.gov>
Sent: Friday, March 01, 2019 9:42 AM
To: vbhat@alamedactc.org
Cc: Fund Management System; Harold Brazil
Subject: FMS POAQC Project TIP ID ALA170009 (Widen I-680 NB Imprv SB for EL: SR-84 to Alcosta) update: Project is a not a POAQC

Dear Project Sponsor

Based on the recent interagency consultation with the Air Quality Conformity Task force, Project TIP ID ALA170009 (FMS ID:6322.00) does not fit the definition of a project of air quality concern as defined by 40 CFR 93.123(b)(1) or 40 CFR 93.128 and therefore is not subject to PM2.5 project level conformity requirement. Please save this email as documentation confirming the project has undergone and completed the interagency consultation requirement for PM2.5 project level conformity. Note project sponsors are required to undergo a proactive public involvement process which provides opportunity for public review as outlined by 40 CFR 93.105(e). For projects that are not of air quality concern, a comment period is only required for project level conformity determinations if such a comment period would have been required under NEPA. For more information, please see FHWA PM2.5 Project Level Conformity Frequently Asked Questions (FAQ): http://www.fhwa.dot.gov/environment/air_quality/conformity/reference/faqs/pm25faqs.cfm

If you have any questions, please direct them to Harold Brazil at hbrazil@bayareametro.gov or by phone at 415-778-6747

**Air Quality Conformity Task Force
Summary Meeting Notes
February 28, 2019**

Participants:

Lynn McIntyre – AECOM

Rodney Tavitas – Caltrans

Dominique Kraft – FTA

Ginger Vagenas – EPA

Panah Stauffer – EPA

Lucas Sanchez – Caltrans

Adam Crenshaw – MTC

Harold Brazil – MTC

1. Welcome and Self Introductions: Harold Brazil (MTC) called the meeting to order at 9:35 am.

2. PM_{2.5} Project Conformity Interagency Consultations

a. Consultation to Determine Project of Air Quality Concern Status

i. I-680 Express Lanes from SR 84 to Alcosta Boulevard Project

Lynn McIntyre (AECOM) started her presentation of the I-680 Express Lanes from SR 84 to Alcosta Boulevard project by stating that the project would construct new HOV/express lanes in median of northbound and southbound I-680 from SR 84 (Vallecitos Road) to north of Alcosta Boulevard. Ms. McIntyre also indicated that the project would:

- Install electronic tolling equipment and signage
- Widen median pavement and bridge structures, and
- Construct retaining walls and sound walls

Ms. McIntyre went on to describe the purpose and need of the I-680 Express Lanes from SR 84 to Alcosta Boulevard project by stating that the project would:

- Increase the efficiency of the transportation system
- Improve travel time reliability for all users
- Optimize freeway system management and traffic operations
- Maintain consistency with legislation to implement an HOV/express lanes system in Alameda County
- Close the 9-mile gap between existing or in-construction HOV/express lane segments to the south and north

Ms. McIntyre discussed that although the project would add an HOV/express lane to each direction to I-680 within the project limits, the majority of diesel trucks are restricted from using either HOV or express lanes and (subsequently) the project would not add capacity for diesel vehicles on I-680. In addition, Ms. McIntyre stated trucks would comprise 4 percent of annual average daily traffic with and without the project and, therefore, the project would not result in a significant increase in the number of diesel vehicles. By providing HOV/express lanes, the project would improve congestion and reduce idling in the general purpose lanes that the trucks use. The project would not be considered a Project of Air Quality Concern under this criterion.

Panah Stauffer (EPA) asked about the significant increases in year 2045 lane densities for segments on Vargas Road and Paloma Way between the no project and project alternatives of the I-680 Express Lanes from SR 84 to Alcosta Boulevard project. Ms. McIntyre explained that the no project alternative produces a 5 hour long bottle-neck situation north of the I-680/Sunol Boulevard exit ramp. In the project alternative, Ms. McIntyre stated that in the year 2045 analysis, the bottle-neck at Sunol Boulevard is removed, but a smaller (2 hour long) bottle-neck is created on I-680 at Paloma Way. Ms. McIntyre went on to say that the project alternative delivers high SB I-680 traffic volumes sooner to the Niles Canyon, thereby generating the bottle-neck at Paloma Way.

Final Determination: With input from FHWA, EPA, Caltrans (deferring their determination to FHWA) and FTA, the Task Force concluded that the I-680 Express Lanes from SR 84 to Alcosta Boulevard project was not of air quality concern.

b. Confirm Projects Are Exempt from PM_{2.5} Conformity

i. Arroyo de Laguna Bridge Scour project (Discussion)

Harold Brazil (MTC) followed up with the Task Force on the GL: Bridge Rehab and Reconstruction – SHOPP/Arroyo de Laguna Bridge Scour project, indicating that one of the project options includes a turn lane leading to a stop sign controlled intersection. Mr. Brazil asked the Task Force members if the Arroyo de Laguna Bridge Scour project should be considered an intersection channelization project and whether the project sponsor should be requested to come in for consultation.

Final Determination: With input from FHWA, EPA, Caltrans and FTA, the Task Force concluded that GL: Bridge Rehab and Reconstruction – SHOPP/Arroyo de Laguna Bridge Scour project was not of air quality concern.

ii. Confirmation of the list of exempt projects from PM_{2.5} conformity (2b_Exempt List 021419.pdf)

Dominique Kraft (FTA) asked if SFMTA's Woods Bus Facility Modernization project (TIPID# SF-190001) would be constructed on the footprint of the existing facility. Adam Crenshaw (MTC) followed up with SFMTA who indicated that all of the work for the Woods Bus Facility Modernization project will take place within the existing footprint of the facility.

Final Determination: With input from FTA, EPA, Caltrans and FHWA, the Task Force agreed that the project on the exempt list (2b_Exempt List 021419.pdf) was exempt from

3. Projects with Regional Air Quality Conformity Concerns

a. Review of the Regional Conformity Status for New and Revised Projects

Projects Staff Proposing to Include in the 2019 TIP

Adam Crenshaw (MTC) stated that MTC staff had received requests from sponsors to add one new individually listed project to the 2019 TIP. Panah Stauffer (EPA) asked for clarification on the action taking place with the Vallejo - Sacramento St Streetscape project being amended to the

2019 TIP and Mr. Crenshaw responded by indicating the information provided is for transparency purposes for MTC's TIP revision process. Lucas Sanchez (Caltrans) commended Mr. Crenshaw on his proactivity in presenting this agenda item to the group and also noted MTC for being the only MPO in the state who conducts this type of process.

4. Consent Calendar

a. February 28, 2019 Air Quality Conformity Task Force Meeting Summary

Final Determination: With input from all members, the Task Force concluded that the consent calendar was approved.

5. Other Items

- Harold Brazil (MTC) mentioned MTC will be generating a conformity determination for the new 2015 ozone NAAQS.
- Rodney Tavitas (Caltrans) stated that any California MPO needing to determine conformity under the 2015 ozone NAAQS, Caltrans recommends that the regional conformity analysis be done as soon as possible due to the proposed Safe Affordable Fuel-Efficient (SAFE) Vehicle rule revising the Corporate Average Fuel Economy (CAFE) and California mobile-source emissions standards and regulations.
- Mr. Tavitas also mentioned the NTI transportation conformity course hosted by Caltrans division 4 in Oakland, March 25-27 and asked if Harold Brazil (MTC) would be willing to participate in a round table discussion on the 27th. Mr. Brazil agreed to attend.

USFWS and NOAA Fisheries Species Lists



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713



In Reply Refer To:

February 27, 2020

Consultation Code: 08ESMF00-2019-SLI-0243

Event Code: 08ESMF00-2020-E-03789

Project Name: Interstate 680 Express Lanes From State Route 84 to Alcosta Boulevard Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building

2800 Cottage Way, Room W-2605

Sacramento, CA 95825-1846

(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0243

Event Code: 08ESMF00-2020-E-03789

Project Name: Interstate 680 Express Lanes From State Route 84 to Alcosta Boulevard Project

Project Type: TRANSPORTATION

Project Description: Road improvement

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.65881032600004N121.90443962171905W>



Counties: Alameda, CA | Contra Costa, CA

Endangered Species Act Species

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse <i>Reithrodontomys raviventris</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered
San Joaquin Kit Fox <i>Vulpes macrotis mutica</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) <i>Masticophis lateralis euryxanthus</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened

Amphibians

NAME	STATUS
<p>California Red-legged Frog <i>Rana draytonii</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/2891</p> <p>Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf</p>	Threatened
<p>California Tiger Salamander <i>Ambystoma californiense</i></p> <p>Population: U.S.A. (Central CA DPS)</p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/2076</p>	Threatened

Fishes

NAME	STATUS
<p>Delta Smelt <i>Hypomesus transpacificus</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/321</p>	Threatened

Insects

NAME	STATUS
<p>Bay Checkerspot Butterfly <i>Euphydryas editha bayensis</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/2320</p>	Threatened
<p>San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i></p> <p>There is proposed critical habitat for this species. The location of the critical habitat is not available.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/3394</p>	Endangered

Crustaceans

NAME	STATUS
<p>Conservancy Fairy Shrimp <i>Branchinecta conservatio</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/8246</p>	Endangered
<p>Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/498</p>	Threatened
<p>Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i></p> <p>There is final critical habitat for this species. Your location is outside the critical habitat.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/2246</p>	Endangered

Flowering Plants

NAME	STATUS
Contra Costa Goldfields <i>Lasthenia conjugens</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7058	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Alameda Whipsnake (=striped Racer) <i>Masticophis lateralis euryxanthus</i> https://ecos.fws.gov/ecp/species/5524#crithab	Final

I-680 Express Lanes From SR 84 to Alcosta Boulevard Project

NMFS Species List, 01/13/2020

Quad Name **Niles**

Quad Number **37121-E8**

ESA Anadromous Fish

CCC Steelhead DPS (T) - **X**

Essential Fish Habitat

Coho EFH - **X**

Chinook Salmon EFH - **X**

Quad Name **Dublin**

Quad Number **37121-F8**

ESA Anadromous Fish

CCC Steelhead DPS (T) - **X**

Essential Fish Habitat

Coho EFH - **X**

Chinook Salmon EFH - **X**

Quad Name **La Costa Valley**

Quad Number **37121-E7**

ESA Anadromous Fish

CCC Steelhead DPS (T) - **X**

Essential Fish Habitat

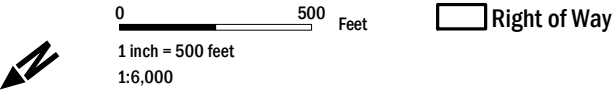
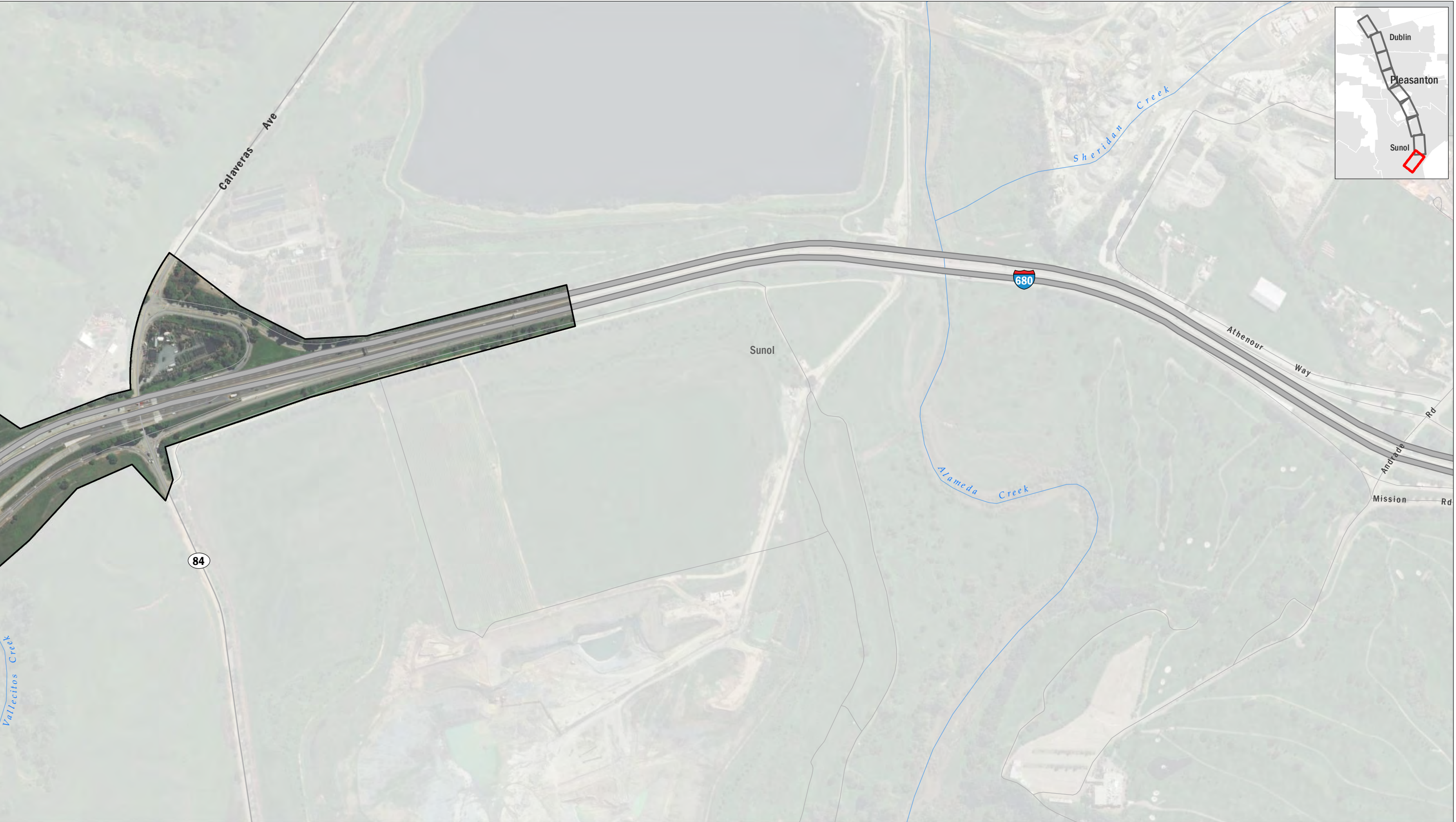
Coho EFH - **X**

Chinook Salmon EFH - **X**

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Appendix D. Noise Measurement and Modeled Receiver and Barrier Locations

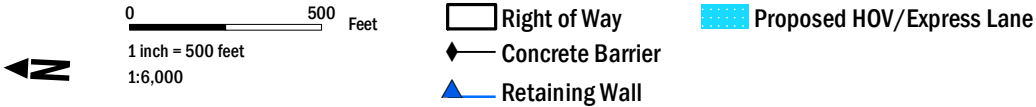
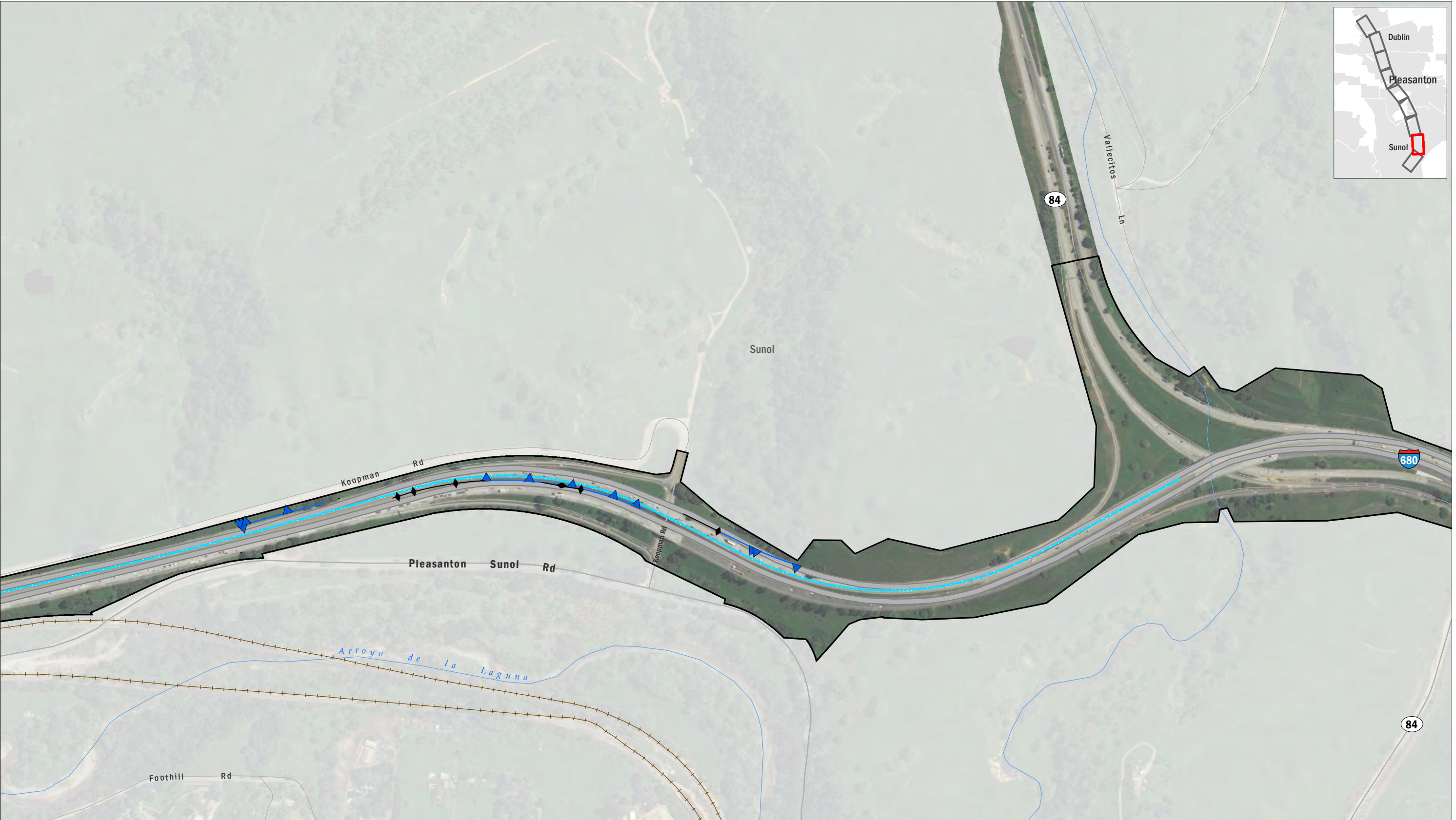
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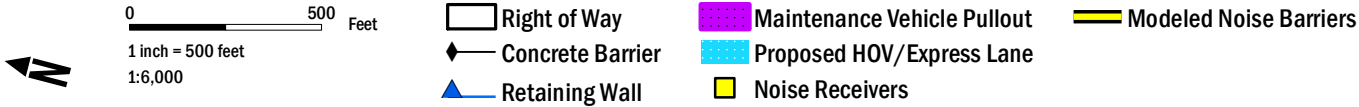
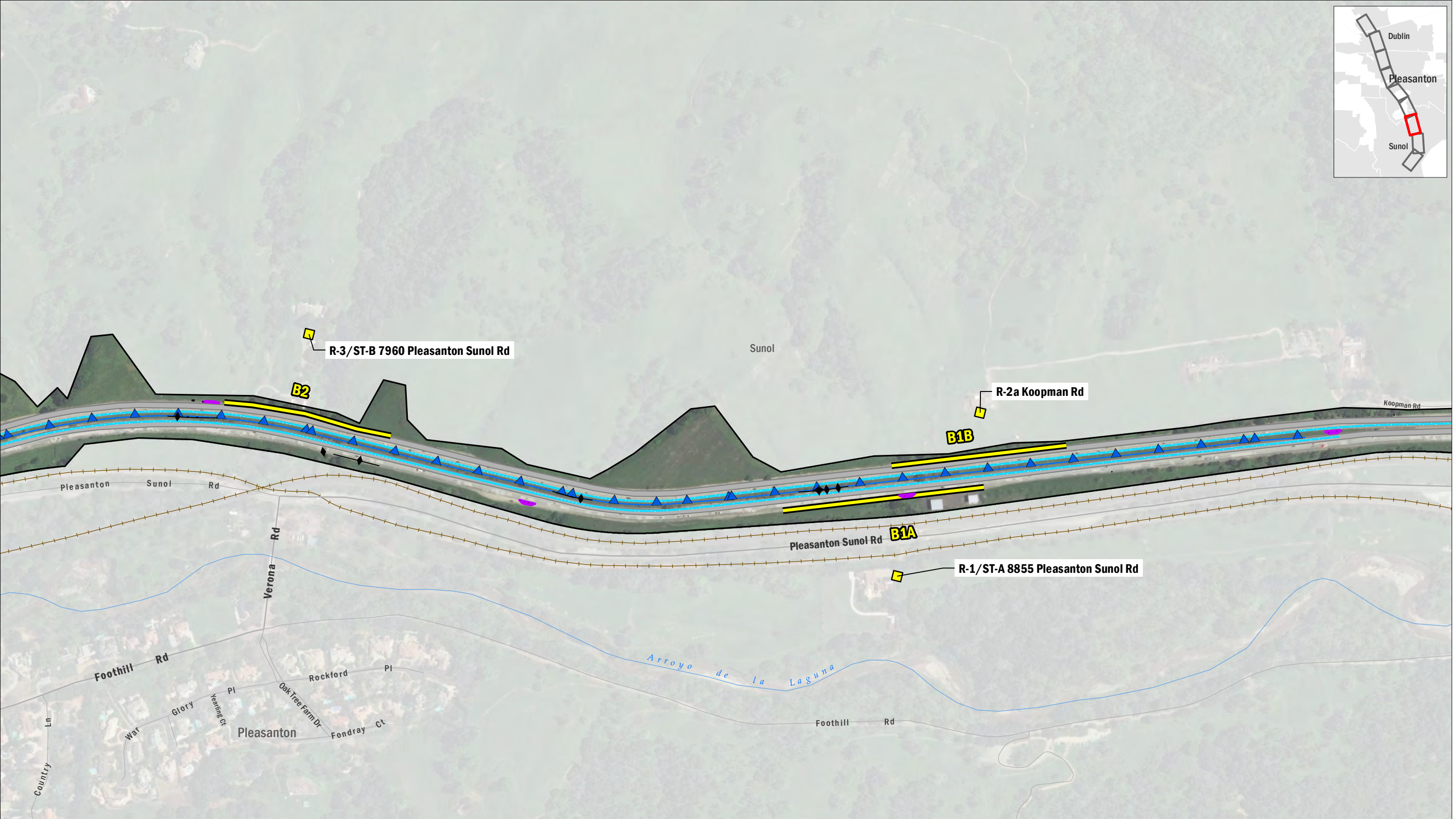
DATA SOURCE
ESRI, 2018
MAP PREPARED BY:
AECOM Otto Alvarez,
5/27/2020

I-680 Express Lanes from State Route 84 to Alcosta Boulevard
Alameda and Contra Costa Counties

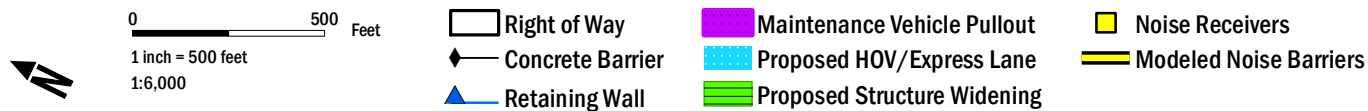
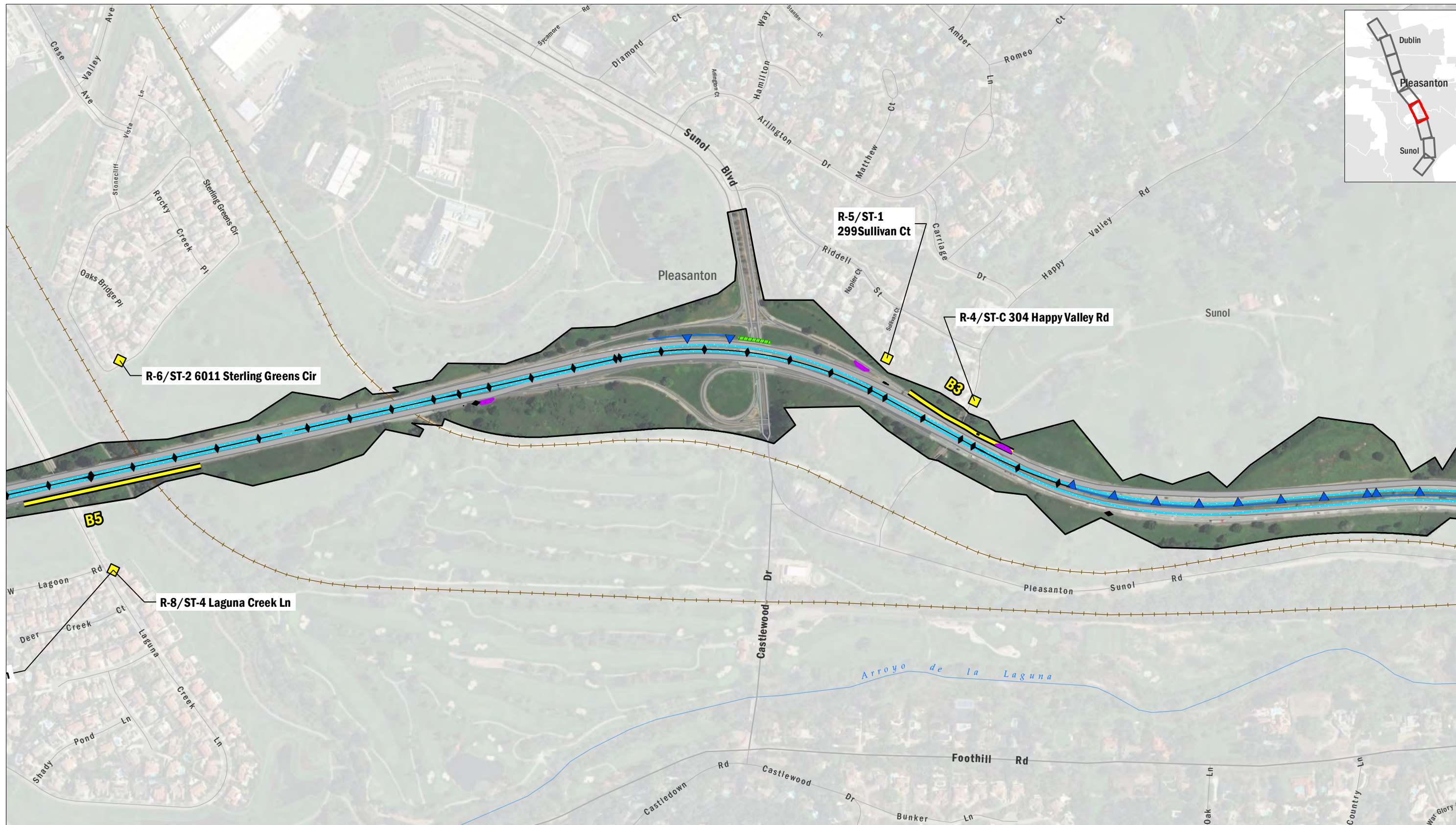
FIGURE D
Project Layout, Receptor Locations, and Modeled Barriers
Page 1 of 9



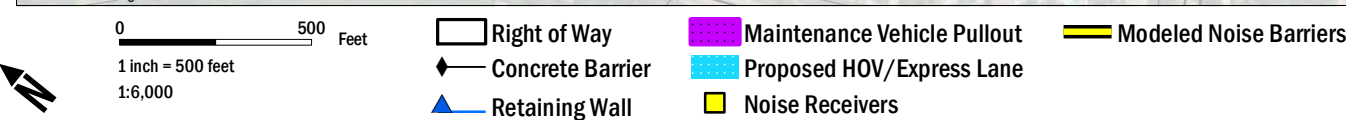
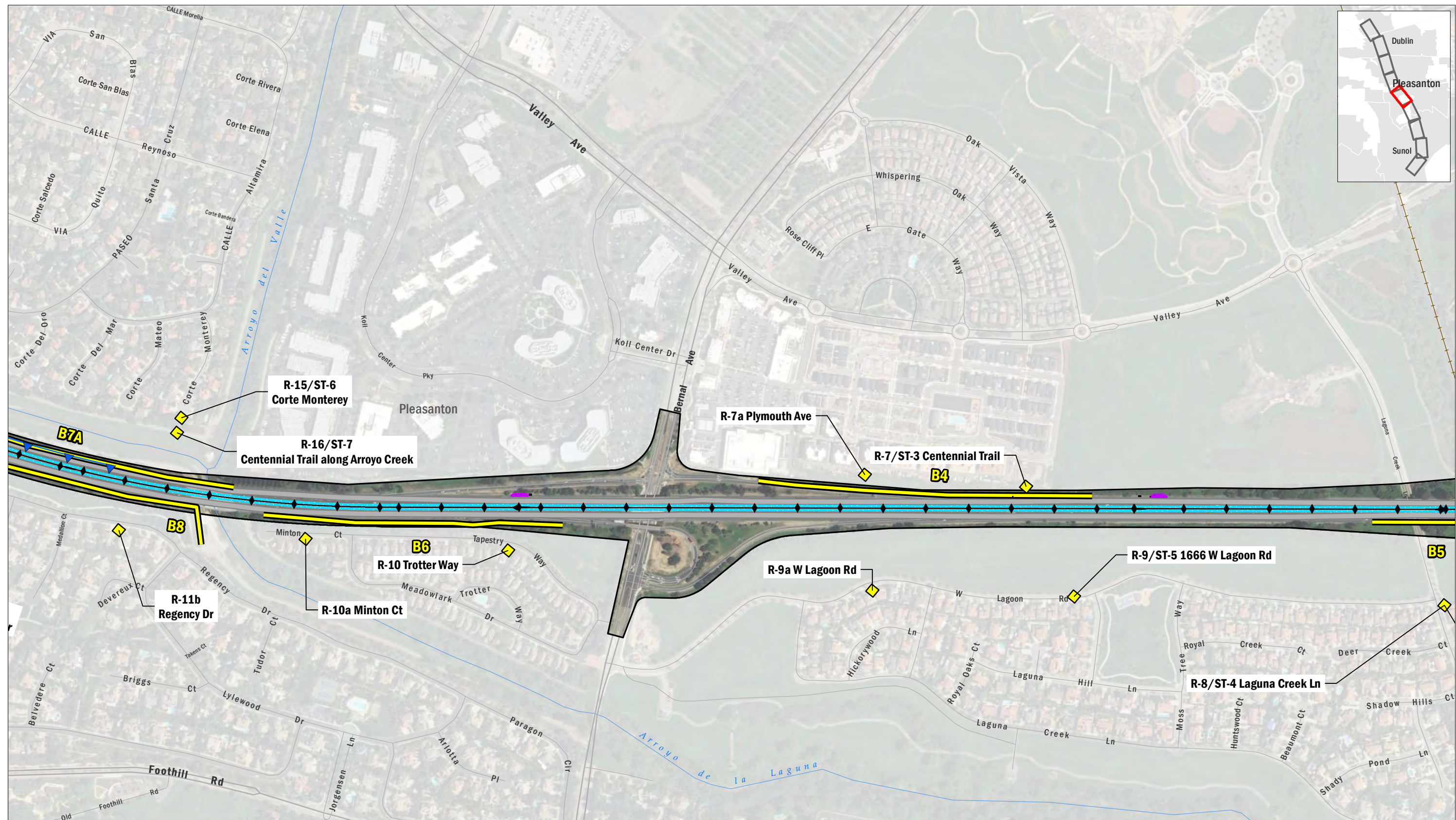
DATA SOURCE
ESRI, 2018
MAP PREPARED BY:
AECOM Otto Alvarez,
5/27/2020



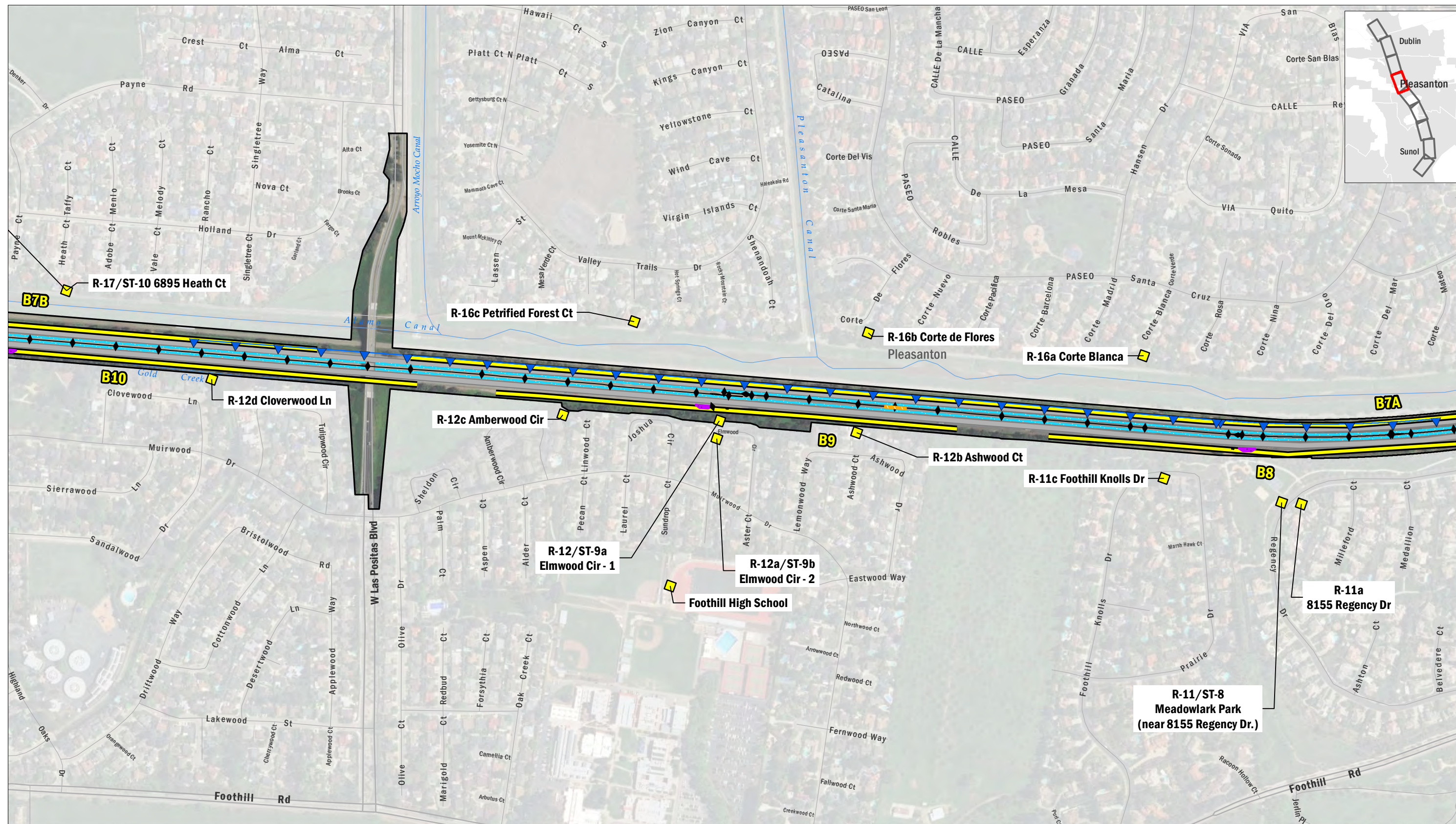
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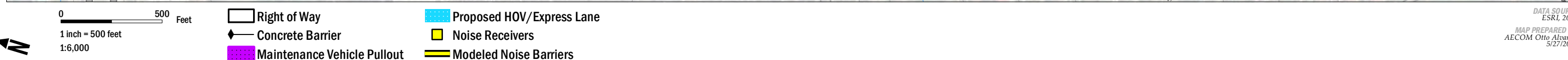
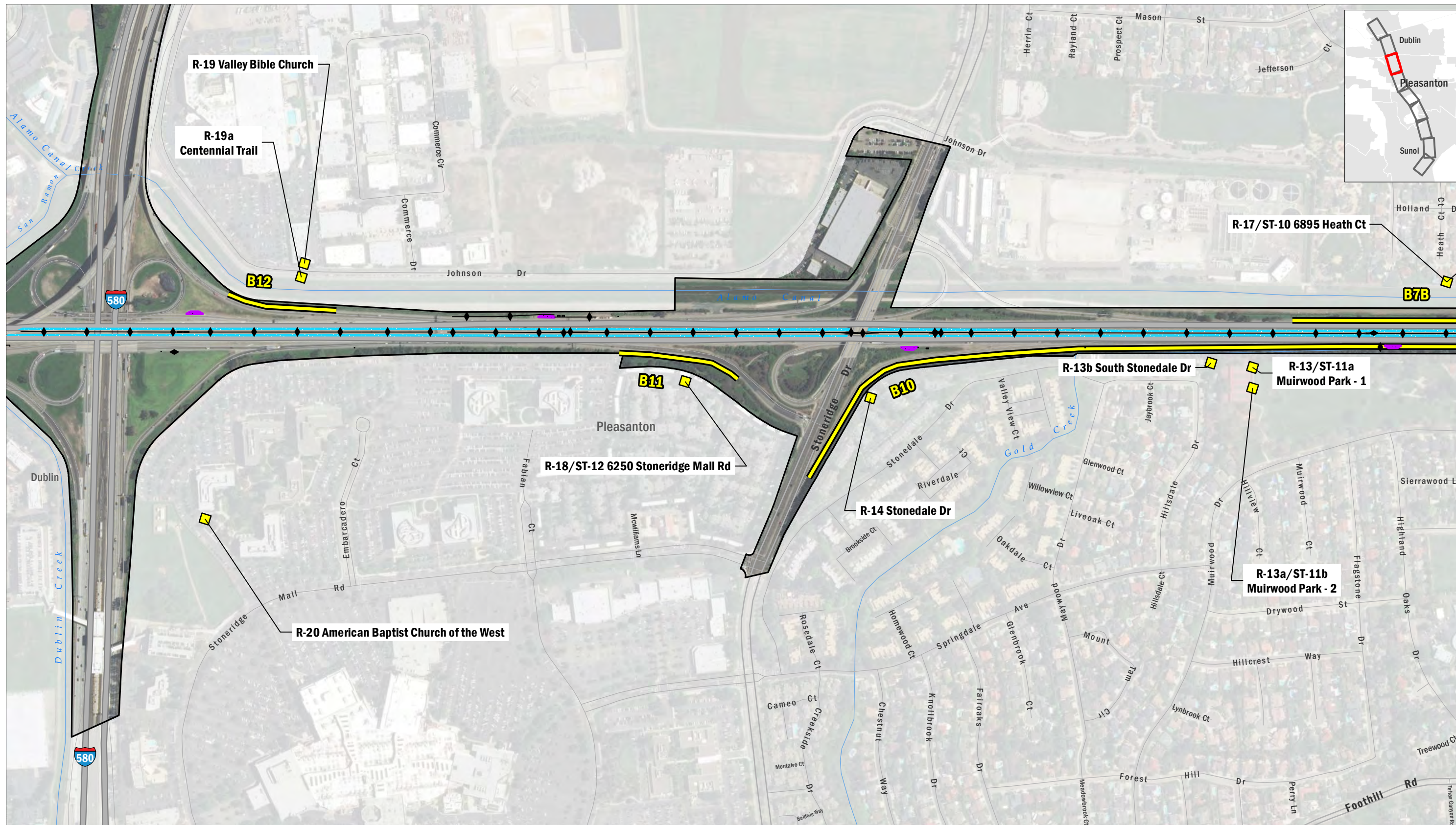
I-680 Express Lanes from State Route 84 to Alcosta Boulevard
Alameda and Contra Costa Counties

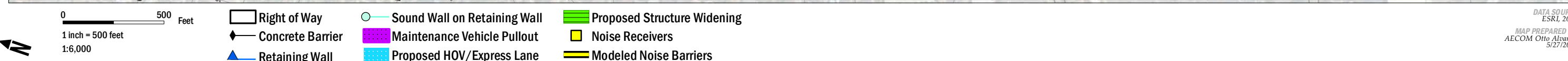
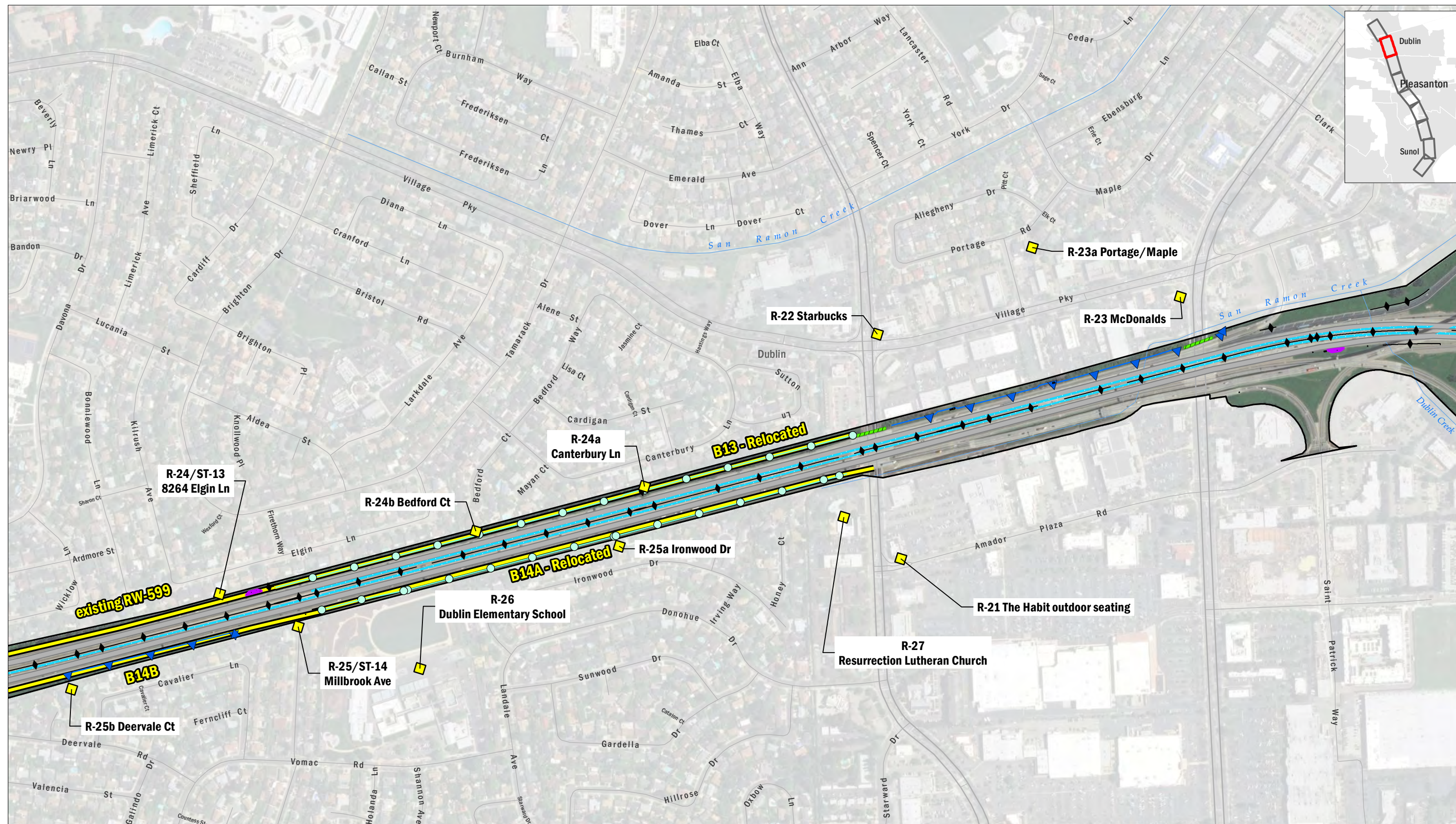
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FIGURE D

Project Layout, Receptor Locations, and Modeled Barriers

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I-680 Express Lanes from State Route 84 to Alcosta Boulevard
Alameda and Contra Costa Counties

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FIGURE D

Project Layout, Receptor Locations, and Modeled Barriers

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I-680 Express Lanes from State Route 84 to Alcosta Boulevard
Alameda and Contra Costa Counties

FIGURE D
Project Layout, Receptor Locations, and Modeled Barriers
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Appendix E. Avoidance, Minimization and/or Mitigation Summary

To be sure that all of the environmental measures identified in this document are executed at the appropriate times, the following mitigation program (as articulated in the proposed Environmental Commitments Record [ECR] that follows) will be implemented. During project design, the following avoidance, minimization, and/or mitigation measures will be incorporated into the project's final plans, specifications, and cost estimates, as appropriate. All permits will be obtained prior to implementation of the project. During construction, environmental and construction/engineering staff will ensure that the commitments contained in this ECR are fulfilled. Following construction and appropriate phases of project delivery, long-term mitigation maintenance and monitoring will take place, as applicable. Some measures may apply to more than one resource area. Duplicative or redundant measures have not been included in this ECR.

Table E-1: Environmental Commitments

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
Visual/Aesthetics			
VIS-1. Vegetation Removal Measures <ul style="list-style-type: none"> Minimize the removal of groundcover, shrubs and mature trees to the maximum extent possible, utilizing open areas for contractor staging/storage areas. Protect existing vegetation outside the clearing and grubbing limits from the contractor's operations, equipment and materials storage. Place high visibility temporary fencing around vegetation to be protected before roadway work begins. Provide truck watering of vegetation when automated irrigation is interrupted by construction. 	2.1.8.4	Caltrans, Alameda CTC	Construction
VIS-2. Highway Replacement Planting <ul style="list-style-type: none"> Replace removed shrubs and trees at a minimum 1:1 replacement ratio. Some native trees would have a replacement ratio of 3:1. Fund required planting through the parent roadway contract to be completed as a separate contract within 2 years of roadway completion, with a 3-year plant establishment period, unless estimated cost is below \$300,000 (which would have a 1-year plant establishment period). Where feasible, vines could be planted along sound walls to reduce visual impacts, potential for glare and reduce the incidence of graffiti. 	2.1.8.4	Caltrans, Alameda CTC	Construction
VIS-3. Revegetation Planting: Grasses. All disturbed areas shall receive hydroseeded treatment of erosion control grasses, and if appropriate, locally native grasses.	2.1.8.4	Caltrans, Alameda CTC	Construction
VIS-4. Aesthetic Treatments <ul style="list-style-type: none"> The design and color treatment for the new overhead sign structures, gantries, VTMS signs and light standards shall be similar to the existing adjacent structures and poles, so to be visually compatible and consistent with the existing installations along the corridor. New concrete safety barriers and retaining walls should match the aesthetics (color, pattern and/or texture) of the existing barriers/walls along corridor visual consistency. Treatments of color, pattern and/or texture are required in order to reduce visual impacts, glare and the possible incidence of graffiti. 	2.1.8.4	Caltrans, Alameda CTC	Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
VIS-5. Construction Impact Measures <ul style="list-style-type: none"> Place unsightly materials, equipment storage and staging so that they are not visible within the foreground of the highway corridor to the maximum extent feasible. Where such siting is unavoidable, material and equipment shall be visually screened to minimize visibility from the roadway and nearby sensitive off-road receptors. Revegetate all areas disturbed by construction, staging and storage per Measures VIS-1 through VIS-3. Limit all construction lighting to within the area of work and avoid light trespass through the use of directional lighting and shielding as needed. 	2.1.8.4	Caltrans, Alameda CTC	Final design
VIS-6. Additional Construction Impact Measures <ul style="list-style-type: none"> Any roadside vegetation and irrigation systems that are damaged or removed during project construction shall be replaced according to Caltrans policy and highway landscaping standards. When trenching for utilities, avoid trenching within drip lines of trees and screening shrubs. Directional drilling that would avoid damaging root systems of established plant material shall be used, when reasonable, as opposed to open trenching to install new conduit in places where work within the drip line would be required. Trees and screening shrubs shall be protected from damage during construction. Provide highway planting within Caltrans right-of-way where feasible to screen residential views of proposed express lane signs and lights. Caltrans safety-setback requirements would apply for all plantings within State right-of-way. Attach all electronic toll readers to sign gantries. Incorporate aesthetic features to lessen visual impacts. 	2.1.8.4	Caltrans, Alameda CTC	Construction
VIS-7. During the detailed design phase, consider topography, visual screening, and adjacent development in the placement of overhead signs, trestle gantries, and sign lighting to minimize visual impacts to residents along the project corridor. Adjust locations of project features where feasible given highway safety standards and other engineering and environmental considerations.	2.1.8.4	Caltrans, Alameda CTC	Final design
Cultural Resources			
CUL-1. 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.	2.1.9.4	Caltrans, Alameda CTC, Construction Contractor	Construction
CUL-2. If human remains are discovered, California Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains. The Caltrans Branch Chief of Archaeology shall be notified, and then the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the NAHC, who, pursuant to Public Resources Code (PRC) Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the Branch Chief of Cultural Resources, Archaeology 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.	2.1.9.4	Caltrans, Alameda CTC, Construction Contractor	Construction
CUL-3. To ensure avoidance of the previously determined eligible site, the site will be designated as an Environmentally Sensitive Area (ESA) for the duration of the project in accordance with the requirements set forth in the Environmentally Sensitive Area Action Plan. The requirements include delineating the ESA on all project plans, conducting a preconstruction meeting with construction personnel to ensure that the ESA is properly understood, and coordinating/monitoring ESA installation by the contractor. In addition, an archaeologist will conduct field reviews of the ESA to ensure that it remains intact and is not compromised.	2.1.9.4	Caltrans, Alameda CTC, Construction Contractor	Final design, construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
Water Quality and Storm Water Runoff			
<p>WQ-1. Implement temporary erosion control and water quality measures as required by the Construction General Permit.</p> <p>Earth-disturbing construction activities should be scheduled to not occur during anticipated rain events. To avoid and minimize any potential sediment laden or contaminated runoff or run-on within the project area, construction site (best management practices) BMPs should be installed before the start of construction or as early as feasibly possible during construction.</p> <p>Measures to be considered for this project would be detailed during the Plans, Specifications, and Estimates (PS&E) phase. The general construction site BMP strategy for this project consists of soil stabilization (including erosion control/revegetation), sediment control (including temporary fiber rolls, silt fencing, and drainage inlet protection), tracking control (temporary construction entrances/exits and street sweeping), non-stormwater management (including appropriate measures for activities such as dewatering, pile driving, and concrete curing), general construction site management, and stormwater sampling and analysis.</p>	2.2.2.4	Caltrans, Alameda CTC, Construction contractor	Final design, Construction
<p>WQ-2. During the PS&E phase, the Project Development Team (PDT) will consider biofiltration swales/strips, detention devices, and gross solid removal devices to promote infiltration and dispersion of runoff.</p>	2.2.2.4	Caltrans, Alameda CTC	Final design
<p>WQ-3. During the PS&E phase, design drainage that includes the use of culvert end devices such as flared end sections, tees, and rock slope protection to dissipate and disperse the energy of runoff as it flows out of the culverts onto open land, existing ditches, or treatment BMPs.</p>	2.2.2.4	Caltrans, Alameda CTC	Final design
<p>WQ-4. During the PS&E phase, design hydromodification management measures that are sized per the Alameda Countywide Clean Water Program's C.3 Technical Guidance (2016).</p>	2.2.2.4	Caltrans, Alameda CTC	Final design
Paleontology			
<p>PAL-1. Implementation of the following measures will avoid potential impacts to sensitive paleontological resources, if present.</p> <ul style="list-style-type: none"> • Update and finalize the Paleontological Mitigation Plan once project design is nearly complete. The final plan will be implemented during construction. • Include a specification in the construction contract stating that paleontological monitoring will occur in accordance with the Paleontological Mitigation Plan. 	2.2.3.4	Caltrans, Alameda CTC	Final design, Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
Hazardous Waste/Materials			
<p>HAZ-1. During the final project design phase, a Preliminary Site Investigation will be performed in accordance with current Caltrans guidance to investigate hazardous materials concerns related to soil, groundwater, and building materials within the project limits and will include required measures for managing hazardous materials encountered during project construction to protect human health and the environment. These measures shall be incorporated in the final project design. Anticipated measures include the following:</p> <ul style="list-style-type: none"> • ADL-contaminated soils exceeding California hazardous waste thresholds shall be reused in accordance with the Department of Substances Control's (DTSC) 2016 Soil Management Agreement for ADL-Contaminated Soils. • Lead compliance plans for ADL-contaminated soils and pavement markings containing lead shall be prepared in accordance with the Caltrans Standard Special Provisions and implemented by the project construction contractor(s) to ensure compliance with Occupational Safety and Health Act (OSHA) and Cal/OSHA worker safety regulations. • Groundwater from dewatering of excavations shall be stored in Baker tanks during construction activities and characterized to determine the appropriate treatment requirements for discharge and disposal. The extracted groundwater shall be collected and managed for disposal/treatment in compliance with local and state regulations. • All loose and peeling lead-based paint and asbestos-containing material shall be removed by a certified contractor(s) in accordance with local, state, and federal requirements. All other hazardous materials will be removed from structures in accordance with Cal/OSHA regulations. • Asphalt concrete and Portland cement concrete grindings shall be reused in accordance with the San Francisco Bay Regional Water Quality Board's (RWQCB) (2007) guidance to protect water quality or transported off-site for recycling or disposal. 	2.2.4.4	Caltrans, Alameda CTC	Final design, Construction
Noise and Vibration			
<p>NOI-1. Standard Caltrans measures that are used for all projects include that construction noise shall not exceed a maximum sound level of 86 dBA at 50 feet from job site activities between the hours of 9:00 PM and 6:00 AM. The following standard measures will also be implemented to minimize or reduce the potential for noise impacts from project construction:</p> <ul style="list-style-type: none"> • Limit pile driving activities to between 7:00 AM and 7:00 PM, where feasible. • Equip all internal combustion engine driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment. • Prohibit unnecessary idling (i.e., greater than 5 minutes in duration) 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 as practical from noise-sensitive receptors. • Utilize "quiet" air compressors and other "quiet" equipment where such technology exists. 	2.2.6.4	Caltrans, Alameda CTC, Construction contractor	Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
Natural Communities			
<p>Vegetation Communities - BIO-1. The measures listed below would be implemented as part of construction to minimize and/or avoid impacts to sensitive vegetation communities, species, and habitat as well as to common biological resources.</p> <ul style="list-style-type: none"> • Before initiation of the proposed action, the qualifications of the biological monitor(s) would be submitted to United States Fish and Wildlife Service (USFWS) and California Department of Wildlife (CDFW) for approval. Such approved biologists are hereafter referred to as the “approved biologist(s).” • The approved biologist(s) (knowledgeable about sensitive species and habitats in the action area) or designee(s) will conduct pre-construction surveys to examine the Biological Study Area (BSA) for occurrences of special-status wildlife species, including nesting birds. In the event that occupied nests or other habitats are found, the approved biologist(s) will adhere to the measures set forth by the USFWS. If the situation is otherwise unique, the approved biologist will discuss the situation with a Caltrans biologist who would contact the USFWS and CDFW to determine how to avoid or relocate the resident animal(s). • Construction Work, Access, and Staging Areas. All proposed construction will be limited to the existing and proposed ROW. ESAs will be identified on contract plans and discussed in the Special Provision. The ESAs will include areas designated in the environmental document and biological reports that support wetlands, waters, and/or habitats that potentially support listed species, and have been specifically identified to avoid during construction. ESA provisions may include, but are not limited to, the use of temporary orange fencing to delineate the proposed limit of work in areas adjacent to sensitive resources, or to delineate and exclude sensitive resources from potential construction impacts. Contractor encroachment into ESAs will not be allowed. This includes staging/operation of heavy equipment or casting of excavation materials. ESA provisions will be implemented as a first order of work and remain in place until all construction is completed. • Construction discharges. No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the State including waters of the United States or drainages. No discharges of excessively turbid water will be allowed, and all equipment will be well-maintained and free of leaks. • Onsite Worker Environmental Awareness Training. Before the onset of construction and within 3 days of any new worker arrival, an approved biologist(s) will conduct an education program for all construction personnel. At a minimum, the training will include a description of California tiger salamander, California red-legged frog, Alameda whipsnake, and other listed species and their habitats; the potential occurrence of these species within the project footprint; an explanation of the status of these species and protection under the Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), and all other federal, state, and local regulatory requirements; the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all construction crews and project personnel entering the project footprint. Upon completion of the program, personnel will sign a form stating that they attended the program and understand all of the avoidance and minimization measures and implications of the FESA, CESA, and all other federal, state, and local regulatory requirements. 	2.3.1.3	Caltrans, Alameda CTC	Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
<p>BIO-1 <i>continued</i></p> <ul style="list-style-type: none"> • Prevention of Wildlife Entrapment. To prevent inadvertent entrapment of listed species during construction excavated holes or trenches more than 1 foot deep with walls steeper than 30 degrees will be covered at the close of each working day by plywood or similar materials. Alternatively, an additional 4-foot-high vertical barrier, independent of exclusionary fences, will be used to further prevent the inadvertent entrapment of listed species. If it is not feasible to cover an excavation or provide an additional 4-foot-high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks will be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the on-site biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape or the USFWS will be contacted by telephone for guidance. The USFWS will be notified of the incident by telephone and electronic mail within 48 hours. • Inspection of Pipes and Culverts. All construction pipes, culverts, or similar structures that are stored at the project site for one or more overnight periods shall be securely capped before storage or inspected by the approved biologist before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a special-status species is discovered inside a pipe by the biologist or anyone else, the individual shall be allowed to leave its own accord, or if it can be safely captured, it shall be relocated by the biologist to a suitable location outside of the project area. The USFWS will be notified of the incident by telephone and electronic mail within 48 hours. • Erosion control. Temporary erosion control and slope stabilization BMPs will be installed before the start of the wet season (October 15 through April 15). Erosion control measures may include silt fencing, straw wattles, straw bales, coir blankets, sediment traps, and other protective measures to minimize the potential for erosion of sediment beyond the work area or degradation of water quality in adjacent aquatic habitats. • Restoration/revegetation. Upon project completion, all temporarily disturbed areas will be restored to pre-construction conditions. • Wildlife exclusion fencing. Wildlife exclusion fencing will be installed along the project perimeter to keep wildlife out of construction areas. 			
<p>Vegetation Communities - BIO-2. Compensatory mitigation for temporary impacts to vegetation communities or Natural Communities of Concern under CEQA, including valley oak woodland, will be provided through the restoration of habitat by planting native species that are typical to that habitat. The restored vegetation communities will be monitored for success. If enough space is not available for on-site mitigation, off-site like-habitat providing these species habitat requirements will be preserved through the purchase of mitigation bank credits.</p>	2.3.1.3	Caltrans, Alameda CTC, Sonoma County	Final design. Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
<p>Trees - BIO-3. Post-construction measures will include revegetation of temporarily impacted areas by the planting of trees where appropriate, selecting sites based on existing topography, hydrology, and surrounding habitat. No riparian trees will be removed as a result of project activities.</p> <p>Trees in permanent impact areas are likely to be removed during project activities. Some trees in temporary impact areas may be preserved depending on the specific activity occurring near them. Caltrans will reduce impacts to trees in temporary impact areas and along the edge of the project footprint to the greatest extent possible during construction by designating trees on plan sheets and marking protected areas (the Critical Root Zone [CRZ]) around trees with bright orange polypropylene ESA fencing. Most healthy trees can tolerate up to 25 percent of root cutting and recover from the loss. Trees that have roots cut on two sides usually suffer much more damage and are less stable. Trees that suffer root loss of greater than 25% or on three or more sides should be considered permanently impacted and removed.</p> <p>Only those trees requiring removal will be cut down. Whenever possible, trees will be trimmed rather than removed. To avoid potential damage to retained trees, trees will be safeguarded during construction through implementation of the following measures as applicable:</p> <ul style="list-style-type: none"> • No construction equipment, vehicles, or materials shall be stored, parked, or staged outside of the project footprint or within the CRZ of trees that are outside of the project footprint. Only the CRZ of trees shown in the plan sheets as permanently impacted can be used for storage, parking, or staging; and • Work will not be performed within the CRZ of trees to be retained without consultation with an ISA-certified arborist. If trees are damaged during construction and become unhealthy or die, the damaged tree(s) will be removed and replaced. <p>A Tree Protection Plan will be prepared and implemented to minimize damage to native trees during construction.</p>	2.3.1.3	Caltrans, Alameda CTC	Final design, Construction
<p>Trees - BIO-4. Final tree replanting and mitigation ratios will be determined in consultation with CDFW. Tree removal may be mitigated through planting at a 3:1 ratio on-site for native species within riparian areas, and for coast live oaks and valley oaks in oak woodlands. For other tree species, Caltrans may provide tree replacement on-site at a minimum 1:1 ratio in the space available. A 3:1 ratio is standard for replacement of impacted oak trees on Caltrans projects. These ratios may be adjusted in consultation with CDFW, and ratios may also be based on size of tree removed, with large-diameter trees requiring greater replacement numbers than small trees. The need for some off-site tree planting may be required. Replanted areas will be monitored for success for up to 10 years. The performance criteria for replacement tree plantings is 70 percent survival of all plantings at the end of the monitoring period (3 to 10 years). If survival drops below 70 percent during the monitoring period, the project sponsor will replace plantings to bring survival above this level.</p> <p>For any trees removed, pruned (i.e., cutting of branches that are greater than 1 inch in diameter), or planted within Alameda County ROW, a permit may be required under the Alameda County Tree Ordinance (Title 12, Chapter 12.11). The ordinance was adopted in 2003 and updated in December 2016 to preserve trees within County ROW by establishing standards and regulations for planting, maintaining, trimming, and removing. No designated species or diameters are outlined in the tree ordinance as requiring a specific replacement ratio. Impacted trees in Contra Costa County may be covered under the Contra Costa County Tree Protection and Preservation Ordinance.</p> <p>In addition, California Senate Resolution No. 17 (1989) directs all state agencies to preserve and protect native oak woodlands to the greatest extent feasible. This resolution may be interpreted as no additional loss of oak trees in areas that historically supported oak woodlands.</p> <p>Precise planting locations will be identified during the final design phase. Planting of trees will occur within the Caltrans ROW. Mitigation and restoration areas will be monitored for three years following the planting to ensure that the mortality rate does not exceed 30 percent of all trees planted. Details for off-site planting and riparian tree planting success criteria will be determined during the project permitting process with CDFW (1602 Streambed Alteration Agreement) and RWQCB (401 Certification).</p>	2.3.1.3	Caltrans, Alameda CTC	Final design, construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
Migratory Corridors - BIO-5. Culverts in serviceable condition would be extended to address the proposed widening and to maintain existing drainage patterns, while undersized culverts would be replaced with larger sizes (i.e., any culvert under 16 inches in diameter will be enlarged to at least 16 inches, and to over 24 inches where space allows). This will maintain connectivity from the east and west sides of Interstate 680 (I-680).	2.3.1.3	Caltrans, Alameda CTC	Final design, construction
Wetlands and Other Waters of the United States			
<p>BIO-6. Standard Caltrans measures that are used for all projects include that a SWPPP and erosion control BMPs will be developed and implemented to minimize any wind or water-related material discharges, in compliance with the requirements of the Regional Water Quality Control Board (RWQCB) as well as the 2018 Caltrans Standard Specifications, Section 13. The SWPPP must also comply with the goals and restrictions identified in the RWQCB's Basin Plan. Any additional measures included in the Water Quality Certification will be implemented. The contractor will also comply with the following standards/objectives (or BMPs) including but not limited to the following:</p> <ul style="list-style-type: none"> Where work areas encroach on wetlands, RWQCB-approved physical barriers adequate to prevent the flow or discharge of sediment into these systems will be constructed and maintained between working areas and streams, lakes, and wetlands. Discharge of sediment into culverts and storm drains will be held to a minimum during construction of the barriers. Discharge will be contained through the use of RWQCB-approved measures that will keep sediment from entering jurisdictional waters beyond the project limits. All off-road construction equipment should be cleaned of potential noxious weed sources (mud and vegetation) before entering the project footprint and after entering a potentially infested area before moving on to another area. The contractor will employ whatever cleaning methods (typically spraying with a high-pressure water hose) are necessary to ensure that equipment is free of noxious weeds. Equipment should be considered free of soil, seeds, and other such debris when a visual inspection does not disclose such material. Disassembly of equipment components or specialized inspection tools is not required. Equipment washing stations will be placed in areas that afford easy containment and monitoring (preferably outside of the project footprint) and that do not drain into sensitive (riparian, wetland, etc.) areas. <p>Upon completion of the project, all temporarily impacted areas will be restored to approximately original site conditions.</p>	2.3.2.4	Caltrans, Alameda CTC, Construction contractor	Final design, Construction
<p>BIO-7. Under Federal and State guidance and rules, adverse, unavoidable impacts to wetlands and other aquatic resources require compensatory mitigation to offset the loss of the functions and values of the feature. Temporary impacts will be mitigated at a minimum 1:1 ratio. A 3:1 ratio is standard for permanent impacts to wetlands and other aquatic resources based on a project's risk of failure to compensate for impacts to wetlands (mitigation project), and the temporal loss, or reduction of functions, during the time it takes a mitigation project to achieve the targeted level of performance for all of its functions. Impacted culverts will be replaced in kind on site. No other mitigation is required.</p>	2.3.2.4	Caltrans, Alameda CTC,	Final design

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
Plant Species			
<p>BIO-8. Before the commencement of construction activities, a qualified biologist shall conduct appropriately timed surveys for the listed plant species. To correspond with these species' blooming periods, the surveys shall include botanical inventories between March and June (to coincide with the blooming period of stinkbells, <i>Diablo helianthella</i>, and bristly leptosiphon) and May through October (the blooming period of Congdon's tarplant).</p> <p>If listed plant species are discovered within the construction area, protective measures will be established. These protective measures will include setting a temporary protective buffer around the plants; ensuring all such plants are numbered, mapped, and identified in the field with pin flags; and conducting appropriate agency coordination. Special-status plant occurrences shall be avoided to the maximum extent possible. If impacts are unavoidable, a relocation plan will be prepared, and the species shall be hand-excavated, removed from within the construction area, and replanted at a suitable location within the Caltrans ROW. The species may be replanted in the temporarily impacted areas during the restoration phase of the project.</p>	2.3.3.4	Caltrans, Alameda CTC	Construction
Animal Species			
<p>Western Pond Turtle - BIO-9. Before any construction activities begin, an approved biologist(s) shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the western pond turtle and its aquatic and upland nesting habitat, the general measures that are being implemented to conserve the western pond turtle as they relate to the project, and the boundaries within which the project may be accomplished.</p> <p>An approved biologist(s) shall survey the work site no more than 48 hours before the onset of activities for signs of western pond turtles and/or western pond turtle nesting activity (i.e. recently excavated nests, nest plugs) or nest depredation (partially to fully excavated nest chambers, nest plugs, scattered egg shell remains, egg shell fragments). Preconstruction surveys to detect western pond turtles should focus on suitable aerial and aquatic basking habitat such as logs, branches, rootwads, and rip-rap, as well as the shoreline and adjacent warm, shallow waters where pond turtles may be present below the water surface beneath algal mats or other surface vegetation. Preconstruction surveys to detect western pond turtle nesting activity should be concentrated within 402 meters (1,319 feet) of suitable aquatic habitat and should focus on areas along south- or west-facing slopes with bare hard-packed clay, silt soils, or a sparse vegetation of short grasses or forbs. If western pond turtles or their nesting sites are found, the biologist shall contact CDFW to determine whether relocation and/or exclusion buffers and nest enclosures are appropriate. If CDFW approves of moving the animal, the biologist shall be allowed sufficient time to move the western pond turtle(s) from the work site before work activities begin.</p>	2.3.4.4	Caltrans, Alameda CTC,	Construction
<p>Nesting Raptors and Migratory Birds - BIO-10. Preconstruction surveys for raptors will be conducted within 500 feet of the construction area, and surveys for other special-status birds and appropriate nesting habitat will be conducted within 50 feet of the construction area, no more than three days before ground disturbing activities. If passerine nests are found within or adjacent to the construction area, a 50-foot buffer will be established, which is typically done using bright orange polypropylene ESA fencing. Raptor nests will receive a 500-foot avoidance buffer. An approved biologist(s) will conduct weekly monitoring during construction, to evaluate the identified nest for potential disturbances associated with construction activities. Construction within the buffer is prohibited until the approved biologist(s) determines the nest is no longer active. If an active nest is found after construction begins, construction activities in the vicinity of the nest will stop until an approved biologist(s) has evaluated the nest and established the appropriate buffer around the nest. If establishment of the buffer is not feasible, CDFW will be contacted for further avoidance and minimization guidelines.</p>	2.3.4.4	Caltrans, Alameda CTC,	Construction
<p>Western Burrowing Owl - BIO-11. Appropriate avoidance, minimization, or protection measures shall be determined in consultation with the CDFW in the event an active burrow is in an area subject to disturbance, or within the typical setback (i.e., occupied burrows or nests within 150 feet of an area subject to disturbance during the nonbreeding season, or within 250 feet of an area subject to disturbance during the breeding season).</p>	2.3.4.4	Caltrans, Alameda CTC,	Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
<p>San Francisco Dusky-Footed Woodrat - BIO-12. To avoid or minimize potential impacts on San Francisco dusky-footed woodrat, Caltrans will implement the following measure as part of the proposed project:</p> <ul style="list-style-type: none"> • Preconstruction Surveys for San Francisco Dusky-Footed Woodrat. Before the start of construction, an approved biologist(s) will conduct a survey of the project footprint and a 30-foot buffer beyond the project footprint boundaries to determine the location of active and inactive woodrat dens. Any dens detected during the surveys will be recorded and mapped in relation to the construction disturbance footprint. In addition, the biologist will evaluate any signs of current woodrat activity, including the presence of fresh scat, freshly chewed vegetation, and the presence of cobwebs covering nest entrances. A 30-foot equipment exclusion buffer will be established around active and inactive dens that can be avoided; within such buffers, all vegetation will be retained and nests will remain undisturbed. • Potential Trapping and Relocation. A woodrat trapping and relocation plan will be developed and implemented before project construction for any nest site that will be directly affected by the proposed project. Specific methods for trapping woodrats and relocation of individuals and their nest sites, as well as identification of suitable sites for relocation, include: <ul style="list-style-type: none"> – Trapping at all woodrat middens mapped within the project's temporary and permanent impact areas, – Installing relocation midden structures, – Relocating trapped woodrats to the relocation midden structures, and – Dismantling existing woodrat middens in the project area to be cleared, to discourage woodrat reoccupation. <p>If suitable habitat is not available for relocation of the woodrats in the project vicinity, offsite locations will be identified. Trapping of the woodrats will be conducted by an approved biologist(s) with a current CDFW collection permit to trap and relocate the species. Ideally, the trapping will occur outside of the breeding period, between September and December.</p>	2.3.4.4	Caltrans, Alameda CTC,	Construction
<p>American Badger - BIO-13. The following measures will be implemented to avoid and minimize potential impacts to the American badger.</p> <ul style="list-style-type: none"> • Preconstruction surveys will be conducted within the project footprint in areas of suitable habitat to identify dens or signs of American badger. These surveys will be conducted no more than 30 days before the start of ground-disturbing activities and will be phased with project build-out. • If an American badger is detected on site at any time during these surveys, CDFW will be contacted to discuss ways to proceed with the project and to avoid take to the maximum extent practicable. 	2.3.4.4	Caltrans, Alameda CTC,	Construction
<p>Special-Status and "High Priority" Bats - BIO-14. No more than two weeks before tree removal, a qualified biologist will conduct a pre-construction survey for crevice and cavity roosting habitat for all areas that provide suitable bat roosting habitat, including human-made structures, snags, rotten stumps, mature trees with broken limbs, exfoliating bark, and dense foliage. Sensitive habitat areas and roost sites will be avoided to the maximum extent practicable. To avoid mortality and reproductive loss, Caltrans may limit tree removal to between September 1 and April 14, outside the breeding season, so as not to disturb maternal colonies or roosts. If potential roost sites (e.g., trees, snags) are to be removed or trimmed, limbs smaller than 3 inches in diameter will be cut and the tree will be left overnight to allow any bats using the tree/snap for roosting time to leave and find another roost. A biological monitor will be present during the trimming or removal of trees/snags. If occupied sites are observed in the BSA, Caltrans will contact CDFW to report occurrences for the agency's database. Caltrans will provide an appropriate buffer between any occupied roost and construction activities. In addition, nighttime construction will be limited. Measures relating to nighttime work include those outlined in Measure BIO-15, as well as the following:</p> <p>Bat Day and Night Roost Avoidance. If deemed necessary, specific day and night bat roost avoidance and minimization measure will be developed through technical assistance with CDFW and bat specialists.</p>	2.3.4.4	Caltrans, Alameda CTC,	Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
<p>General Measure - BIO-15. Potential light, glare, and construction noise and vibration impacts on wildlife will be addressed through the following measures:</p> <ul style="list-style-type: none"> • Use lighting in areas only where necessary for safety and signage. Eliminate all lighting in other areas. • All lighting should be downcast to minimize lighting of natural areas, particularly in riparian areas and adjacent to drainages. • Limit operation of vibration causing equipment such as pile drivers, dozers, and large excavators to daylight hours when working in areas adjacent to open space. • A biological monitor shall be present to observe activities of wildlife during nighttime construction adjacent to open spaces. If activities are noted to affect wildlife, the biological monitor shall stop construction activities as necessary. 	2.3.4.4	Caltrans, Alameda CTC,	Construction, postconstruction
Threatened and Endangered Species			
<p>California Tiger Salamander - BIO-16. The following avoidance and minimization measures are proposed to avoid impacts to California tiger salamander:</p> <ul style="list-style-type: none"> • Where feasible, project activities in dispersal habitat will be timed to occur during the dry season (nonbreeding season for the California tiger salamander) (April 15 through October 15) to minimize potential effects to salamander breeding and dispersal. • Portions of the project footprint that are suitable refuge habitats for the California tiger salamander (i.e., grasslands and other natural habitats within 1.24 miles of potential breeding sites) will be surveyed before initiating ground-disturbing activities to identify burrows or other potential sites (under materials that could provide cover such as boards, scrap metal, woody debris, or other materials) that might be occupied by this species. To the extent feasible, potentially occupied refugia burrows within the project footprint will be fenced and avoided for the duration of the activity at that location. • Within 24 hours before initial ground-disturbing activities, portions of the project footprint where potential California tiger salamander habitat has been identified will be surveyed by an approved biologist(s) to clear the site of salamanders moving above-ground, or taking refuge in burrow openings or under materials that could provide cover such as boards, scrap metal, woody debris, or other materials. • An approved biologist(s) will be present during initial ground-disturbing activities in suitable refugia habitats for the California tiger salamander to monitor the removal of the top 12 inches of topsoil at all project locations. If California tiger salamanders are discovered during the initial ground-disturbing activities, work will be stopped immediately and the biologist will contact CDFW and USFWS within one working day. The biologist in consultation with CDFW and USFWS will use adaptive management to modify as necessary project activities to avoid or minimize effects to listed species. • If individual animals are observed, work at that location will be temporarily halted while the approved biologist(s) excavates the occupied burrow by hand, and the individual salamander is moved to a natural burrow within 0.25 mile of the construction site. CDFW will be notified if California tiger salamanders are found and relocated. Any listed amphibian will be released at the mouth of a suitable burrow and then observed until it has safely entered the burrow. • All excavated, steep-walled holes or trenches more than 1 foot deep with walls steeper than 30 degrees should be covered with plywood or provided with an escape ramp of earth fill or wooden planks at the close of each working day. Before filling trenches or holes, the sites should be thoroughly inspected for listed species. • An erosion and sediment control plan will be implemented to prevent impacts of construction on breeding, dispersal, and foraging habitat outside the work areas. 	2.3.5.4	Caltrans, Alameda CTC	Construction

Minimization and/or Mitigation Measure	IS/EA Section Reference	Responsible Party	Timing
<p>BIO-17. Caltrans proposes mitigation for California tiger salamander through on-site restoration of all temporarily impacted areas. Although the project will result in the temporary loss of potential dispersal, foraging, and refugia habitat, replanting with native erosion control species will result in improvements to California tiger salamander upland habitat within the temporarily disturbed areas of the project footprint.</p> <p>Caltrans anticipates a need for off-site compensation for permanent impact areas. In order to mitigate for permanent direct effects to California tiger salamander under CESA, as well as for California red-legged frog and Alameda whipsnake, Caltrans proposes to purchase habitat credits at a 3:1 ratio from an approved mitigation bank such as Ohlone West Conservation Bank or Collier Canyon Mitigation and Conservation Bank (which is still in agency review). The purchase of multi-species bank credits may be used to satisfy the conditions of multiple agencies and jurisdictions including FESA, CESA, and the California Environmental Quality Act (CEQA) process. The final mitigation may be subject to change during the consultation and permitting processes.</p> <p>To mitigate temporary impacts, Caltrans proposes to restore the habitat on-site. If it becomes evident after construction that it is not physically possible or appropriate to restore all temporary impacts acres on-site, Caltrans will purchase additional off-site mitigation.</p>	2.3.5.4	Caltrans, Alameda CTC	Construction
<p>California Red-Legged Frog - BIO-18. Portions of the project footprint that are suitable refuge habitats for California red-legged frogs (i.e., grasslands and other natural habitats within 1 mile of potential breeding sites) will be surveyed before initiating ground-disturbing activities to identify burrows or other potential sites that might be occupied by this species. To the extent feasible, potentially occupied refugia within the project footprint will be fenced and avoided for the duration of the activity at that location.</p>	2.3.5.4	Caltrans, Alameda CTC	Final design, Construction
Invasive Species			
<p>BIO-19. In compliance with the EO on Invasive Species, EO 13112, and guidance from the Federal Highway Administration, the landscaping and erosion control included in the project will not use species listed as invasive. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.</p>	2.3.6.4	Caltrans, Alameda CTC	Final design, Construction

Appendix F. List of Acronyms

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACHP	Advisory Council on Historic Preservation
ADL	aerially deposited lead
Alameda CTC	Alameda County Transportation Commission
APE	Area of Potential Effects
BAAQMD	Bay Area Air Quality Management District
BAU	business-as-usual
bgs	below ground surface
BMP	Best Management Practice
BSA	Biological Study Area
BTU	British thermal unit
Caltrans	California Department of Transportation
Cal/OSHA	California Division of Occupational Safety and Health
CAP	Climate Action Plan
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CPUC	California Public Utilities Commission
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CIDH	cast-in-drilled-hole
CNDDDB	California Natural Diversity Data Base
CO	carbon monoxide

CRZ	Critical Root Zone
CTP	California Transportation Plan
CWA	Clean Water Act
dB	decibel(s)
dBA	A-Weighted decibel(s)
DSRSD	Dublin-San Ramon Services District
DLD	Dedicated Land Disposal
DSA	Disturbed Soil Area
DTSC	Department of Toxic Substances Control
EA	Environmental Assessment
EIR	Environmental Impact Report
EO	Executive Order
ESA	environmentally sensitive area
EV	electric vehicle
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GHG	greenhouse gas
HOV	High Occupancy Vehicle
I-	Interstate
in/sec PPV	inch(es) per second of peak particle velocity
IS	Initial Study
ISA	Initial Site Assessment
LED	light-emitting diode
LOS	Level of Service

MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
mph	mile(s) per hour
MS4	municipal separate storm sewer systems
MSAT	Mobile source air toxics
MTC	Metropolitan Transportation Commission
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
NHTSA	National Highway Traffic Safety Administration
NO ₂	nitrogen dioxide
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Service
NPDES	National Pollutant Discharge Elimination System
O ₃	ozone
OCF	organochlorine pesticides
OHWM	ordinary high water mark
OSHA	Occupational Safety and Health Act
PA	Programmatic Agreement
PA&ED	Project Approval and Environmental Document
pB	lead
PCE	Primary Constituent Element
PDA	priority development areas
PDT	Project Development Team
PG&E	Pacific Gas and Electric Company

PM	post mile
PM10	particulate matter 10 micrometers or smaller
PM2.5	particulate matter 2.5 micrometers or smaller
POAQC	Project of Air Quality Concern
PRC	Public Resources Code
PS&E	Plans, Specifications, and Estimates
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SFBAAB	San Francisco Bay Area Air Basin
SLR	sea-level rise
SFPUC	San Francisco Public Utilities Commission
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SOV	single-occupant vehicles
SR	State Route
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
Task Force	Bay Area Air Quality Conformity Task Force
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TMDL	Total Maximum Daily Load
TMP	Transportation Management Plan
TNAP	Caltrans Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects (2011)
TSM	Traffic Systems Management

UGB	urban growth boundary
USACE	United States Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VHD	Vehicle Hours of Delay
VIA	Visual Impact Assessment
VMT	vehicle mile(s) traveled
VTMS	variable toll message sign
vph	vehicle(s) per hour
WBWG	Western Bat Working Group
WDR	Waste Discharge Requirement

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