I-680 Northbound HOV/Express Lane Project

SANTA CLARA AND ALAMEDA COUNTIES, CALIFORNIA
DISTRICT 04 - SCL-680 (PM 6.5/9.9) – ALA-680 (PM 0.0/12.4)
EA 04-4G0500/0412000437

Draft Environmental Impact Report/ Environmental Assessment (EIR/EA)

Prepared by the State of California Department of Transportation

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

Caltrans

November 2014

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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 Environmental Impact Report/Environmental Assessment (EIR/EA), which examines the potential environmental impacts of the alternatives being considered for the proposed project located in Alameda and Santa Clara Counties, California. Caltrans is the lead agency for preparing the environmental document in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The document tells you why the project is being proposed, alternatives considered, how the existing environment could be affected by the alternatives, the potential impacts of each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

WHAT YOU SHOULD DO:

- Please read the document
- This document is available in electronic format at:
  http://www.dot.ca.gov/dist4/envdocs.htm
- Additional copies of this document are available for review at:
  - Caltrans District 4, 111 Grand Avenue, Oakland, CA
  - Alameda County Transportation Commission, 1111 Broadway, Suite 800, Oakland, CA
  - City of Fremont, Planning Division, 39550 Liberty St, Fremont, CA
  - City of Pleasanton, Planning Division, 200 Old Bernal Avenue, Pleasanton, CA
  - City of Milpitas, Planning Division, 455 East Calaveras Boulevard, Milpitas, CA
- Attend the public meetings scheduled for:

JANUARY 8, 2015 6:30-8:30 PM
Mission High School
41717 Palm Avenue
Fremont, CA 94539

JANUARY 13, 2015 6:30-8:30 PM
Hearst Elementary School
5301 Case Avenue
Pleasanton, CA 94566

- We would like to hear what you think. If you have any comments regarding the proposed project, please attend the public meeting and/or send your written comments to Caltrans by the deadline.
- Submit comments via postal mail to:

  California Department of Transportation, District 4
  Attn: Wahida I. Rashid
  111 Grand Avenue
  Office of Environmental Analysis, MS-8B
  Oakland, CA 94612

- Submit comments via email to: wahida.rashid@dot.ca.gov

Be sure to submit comments by the deadline: Friday, January 23, 2015

WHAT HAPPENS NEXT

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

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 California Department of Transportation, Attn: Wahida I. Rashid, 111 Grand Avenue, Office of Environmental Analysis MS-8B, Oakland, CA, 94612; (510) 286-5935, Voice, or use the California Relay Service TTY number, 711.

SCH No. 2012092028
DISTRICT 04-SCL-680 PM 6.5/9.9
04-ALA-680 PM 0.0/12.4
EA 04-4G0500/Project No. 0412000437

Construct an approximately 15-mile High Occupancy Vehicle/express lane (HOV/express lane) project on northbound Interstate 680 (I-680) from south of State Route (SR) 237 in Santa Clara County to north of SR 84 (Vallecitos Road) in Alameda County.

DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL ASSESSMENT

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

THE STATE OF CALIFORNIA
Department of Transportation

And

Cooperating Agency: Alameda County Transportation Commission

11-14-14
Date of Approval

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

The following persons may be contacted for additional information concerning this document:

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SUMMARY

INTRODUCTION

The California Department of Transportation (Caltrans), in cooperation with the Alameda County Transportation Commission (Alameda CTC) and Federal Highway Administration (FHWA), propose to construct an approximately 15-mile High Occupancy Vehicle/express lane (HOV/express lane) project on northbound Interstate 680 (I-680) from south of State Route (SR) 237 in Santa Clara County to north of SR 84 (Vallecitos Road) in Alameda County. The HOV/express lane would be a specially-designated freeway lane that is free for carpools and other eligible HOV users, but also gives single-occupancy-vehicles the option to pay tolls to use the HOV/express lane. **Figure S-1** shows the general location of the proposed improvements extending along I-680 from Post Mile 6.5 in Santa Clara County to 12.4 in Alameda County. The new HOV/express lane would pass in or near the cities of Milpitas, Fremont, and Pleasanton, and the community of Sunol. The I-680 Sunol Smart Carpool Lane Joint Powers Authority (SSCLJPA) would operate the express lane.[1]

Caltrans is the lead agency responsible for preparing this draft Environmental Impact Report/Environmental Assessment (EIR/EA) in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

OVERVIEW OF THE PROJECT LIMITS

The proposed improvements are located within a mixture of urban, suburban, and rural development patterns, with a diverse mixture of land uses through the cities of Milpitas, Fremont, and other communities in the East Bay hills. The southern portion of the study area, from SR 237 in Milpitas to the Alameda County line, is surrounded by residential, commercial, office, and public facility uses. Travelling north, through the City of Fremont, the I-680 corridor is surrounded by a mix of commercial, industrial, institutional, residential, parks and open space uses. From the northeastern Fremont hills through the community of Sunol, in unincorporated Alameda County, land uses are predominantly large agricultural properties and open space.

[1] In 2004, the State Legislature passed Assembly Bill (AB) 2032, authorizing two pilot express lanes in Northern California. The Streets and Highway Code Section 149.5, established the SSCLJPA, and further authorized the SSCLJPA and its members, consisting of Alameda CTC (formerly ACCMA and ACTIA), and Santa Clara Valley Transportation Authority (VTA) to conduct, administer, and operate a value pricing HOV program in the I-680 corridor in Alameda and Santa Clara counties.

Project Location Map

Figure S-1

Source: Circlepoint, 2014

PROJECTS IN THE STUDY AREA

There are 27 planned developments within the communities adjacent to the project limits, which are predominately residential development projects (refer to **Section 2.4.2, Cumulative Analysis**). Other planned development projects include several institutional, commercial, and mixed-use commercial/residential land uses. Construction is also underway for two new Bay Area Rapid Transit (BART) stations in the Warm Springs area of Fremont and in downtown Milpitas.

Planned and approved transportation improvements along local routes may be implemented by local agencies or under other projects (see **Section 2.4.2, Cumulative Analysis**, for a detailed discussion). Such projects include the following:

- I-680 Ramp Metering Project
- I-680 Pavement Rehabilitation Project
- I-680 Northbound Express Lane Extension (from SR 84 to south of Alcosta Boulevard)
- I-680 Express Lanes Project, Bay Area Infrastructure Financing Authority (BAIFA) (HOV conversion from Rudgear Road to Alcosta Boulevard in the southbound direction and from Alcosta Boulevard to Livorna Road in the northbound direction)
- SR 84 Expressway Widening Project (Ruby Hills Drive to Jack London Boulevard)
- SR 84 Expressway Widening Project (I-680 to Pigeon Pass)
- I-680/I-880 Cross Connector
- I-580 Express Lanes (east of I-680)
- Mission Boulevard Streetscape Improvements (between Verde Way and Mission Creek, Fremont)

PURPOSE AND NEED

PURPOSE

The Metropolitan Transportation Commission (MTC) Transportation 2035 Plan establishes the implementation of a regional express lanes network to effectively improve throughput and reduce delays on the major travel corridors within the San Francisco Bay Area, including northbound I-680. To address these issues, the proposed project would fulfill the following goals:

- Increase the efficiency of the transportation system on northbound I-680 between SR 237 and SR 84 to accommodate current and future traffic demand
- Improve travel time and travel reliability for all users, including HOV and transit users
- Optimize freeway system management and traffic operations
- Maintain consistency with the provisions defined in California State Assembly Bill (AB) 2032 and AB 574 to implement an HOV/express lanes system in Alameda County

NEED

- **Capacity and Transportation Demand**. The existing roadway features and freeway mainline capacity of northbound I-680 within the project limits are inadequate to accommodate the existing traffic demand.[2] The result is traffic congestion and delay during afternoon peak travel periods, when the corridor serves as a major commute route for people who work in Silicon Valley and live in eastern Alameda County, Contra Costa County, or the northern part of the San Joaquin Valley.[3] **Tables 2.1.7-1** and **2.1.7-2**, in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities,** of this EIR/EA summarize current and forecast mainline and ramp operations along I-680 within the traffic study area, respectively. A substantial number of drivers divert off of I-680 and use local roads. The additional traffic diverted from the freeway is resulting in traffic congestion on city streets during peak commute periods.

  Projections of future conditions on the I-680 corridor within the project limits indicate that the demand for travel is expected to far exceed the available capacity during peak periods, adversely affecting travel speeds and creating bottlenecks at constrained locations. It is projected that the number of vehicles using this segment of I-680 will increase by up to 28 percent, and the period of LOS F conditions will extend for more than six hours by the year 2040.[4]

- **Travel Time Delay for all Users.** Current data on corridor travel speeds indicate that travelers experience substantial delays during the peak period; the time required to traverse the corridor is twice as long as during off-peak periods, and each traveler experiences delays of 15 to 20 minutes when compared to free-flowing conditions. Forecasted conditions indicate a level of traffic congestion that is also expected to reduce transit service reliability.

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[2] The freeway "mainline" refers to the general mixed-flow travel lanes that are open to all drivers.
[3] According to 2011 traffic count data, the weekday three-hour peak commute period for the project corridor occurs from 3:45 to 6:45 PM, with the heaviest hour of traffic occurring from 5:15 to 6:15PM.
[4] Caltrans, 2014n. *I-680 Express Lane, Traffic Operations Analysis Report*.

- **Traffic Diversion and Unused Capacity.** Based on fall 2011 traffic counts at all of the ramps, there is a sharp increase in traffic using the Sheridan Road off-ramp and a very similar spike in traffic using the Andrade Road on-ramp on weekdays between the 5:00 and 7:00 PM time period. This indicates a substantial number of drivers (approximately 600 vehicles in the peak hour alone) are choosing to divert off of I-680 and use local roads to avoid congestion on the freeway. Similarly, a large amount of traffic diversion occurs on Mission Boulevard, between SR 262 and SR 238, and on Calaveras Road, between SR 237 and SR 84. In the case of Mission Boulevard, the additional traffic diverted from the freeway is resulting in traffic congestion (LOS F conditions) on city streets during peak commute periods. Traffic diversion is likely to further increase as freeway traffic conditions worsen with anticipated growth, creating even more congestion on city streets during peak commute periods.

  Because this corridor primarily serves commuters that tend to follow similar daily and weekly travel patterns, the experience with the southbound HOV/express lane indicates that there is a demand for this type of facility in the northbound direction. Based on future traffic forecasts, the HOV lane usage for the majority of the project limits would be in the range of 700 to 1,300 vehicles per hour during the peak commute periods in year 2020, while the capacity of an HOV lane is approximately 1,650 vehicles per hour. These numbers indicate that while there is substantial demand for an HOV lane, there would be unused capacity in the HOV lane, where the potential exists to "sell" the available capacity to toll-paying single-occupancy-vehicles.

- **Legislation**. On January 1, 2005, AB 2032 authorized the Alameda CTC and VTA to implement express lanes on 280 miles of freeway network. As part of a demonstration program, AB 2032 authorized both agencies to conduct, administer, and operate value pricing programs on two of their congested transportation corridors, including the I-680 corridor within the project limits. AB 2032 originally included a sunset provision that authorized the pilot program to operate for a period not to exceed four years after the agency first collects revenues. California State AB 574; approved October 11, 2007, eliminated the sunset provision in AB 2032, authorizing the program to operate indefinitely. The enabling legislation stipulates that revenue collected from the express lanes will be reinvested in projects and services that provide traffic congestion relief within the express lane corridor.

AB 2032 also includes provisions that require HOV/express lanes to operate at level of service (LOS) C conditions.[5,6] This LOS C requirement generally corresponds to a minimum average operating speed of 45 miles per hour (mph) for HOV/express lanes with a speed limit of 50 mph or higher.[7] The minimum LOS C requirement is intended to provide HOV/express lane users with reliable travel times.

PROPOSED ACTION

This section describes the proposed action and the design alternatives that were developed to meet the previously identified project purpose and need, while avoiding or minimizing environmental impacts. The alternatives are the "Build Alternative" and the "No-Build Alternative".

Other alternatives were considered but eliminated as none were deemed viable because of physical constraints and feasibility, or because they did not meet the project's purpose and need. See **Section 1.3.3, Alternatives Considered but Eliminated from Further Discussion**. Caltrans and ACTC are continuing to evaluate additional design refinements that may reduce the project footprint and minimize environmental effects.

BUILD ALTERNATIVE

The Build Alternative proposes to construct a new HOV/express lane facility on northbound I-680 from SR 237 (Calaveras Road) in Santa Clara County to SR 84 (Vallecitos Road) in Alameda County, a distance of approximately 15 miles. The Build Alternative is anticipated to be constructed in multiple phases and represents the long-term vision for build out of the HOV/express lane facility on northbound I-680 from SR 237 to SR 84. The Build Alternative would consist of the following primary improvements, discussed in detail further below:

- addition of a new HOV/express lane in the northbound direction on I-680 extending from SR 237 in Santa Clara County to SR 84 (Vallecitos Road) in Alameda County
- installation of electronic tolling equipment and signage
- widening of existing paved surfaces in the median and to the outside of the mainline

[5] California Streets and Highways Code Section 149.5(b); LOS D operating conditions in the HOV lane are only allowed with written approval of Caltrans.
[6] Level of Service (LOS) is a measure of traffic conditions and the perception of such conditions by motorists. There are six LOS ratings, ranging from LOS A (free traffic flow with low volumes and high speeds, resulting in low vehicle densities) to LOS F (traffic volumes exceeding the capacity of the infrastructure, resulting in forced flow operations, slow speeds, and high vehicle densities). LOS E or F is typically considered unacceptable by Caltrans, and indicates a need for improvement. Refer to **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, for a detailed discussion of LOS criteria.
[7] USC Title 23, Section 166(d)(2)

- construction of auxiliary lanes at various locations on northbound I-680 to improve weaving operations at both ramp locations and express lane access points
- widening or modification of overcrossing and undercrossing structures to accommodate freeway widening
- demolition and replacement of the Sheridan Road overcrossing
- widening the east side of Alameda Creek Bridge
- construction of retaining walls at various locations to accommodate the northbound widening
- new and replacement sound walls, as required
- modification of existing ramp metering and Traffic Operations System (TOS) facilities
- pavement rehabilitation on northbound I-680 between Auto Mall Parkway and Koopman Road

Appendix G includes detailed exhibits of the improvements that would be constructed under the Build Alternative.

Phase 1 – Initial Construction Phase

The Build Alternative is anticipated to be constructed in multiple phases and represents the long-term vision for build out of the HOV/express lane facility on northbound I-680 from SR 237 to SR 84. A first phase of the Build Alternative (Phase 1) would include the construction of a new HOV/express lane facility on northbound I-680 from Auto Mall Parkway to SR 84 (Vallecitos Road), a distance of approximately 8 miles, and an auxiliary lane between the Washington Boulevard on-ramp and SR 238 (Mission Road) off-ramp. **Figure S-1** shows the general location of the proposed improvements within Phase 1, extending along I-680 from Post Mile 3.4 to Post Mile 12.4, in Alameda County.[8]

Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures, of this environmental document evaluates the potential effects of the full Build Alternative, including the initial phase of construction (Phase 1). Where appropriate, the environmental consequences and avoidance, minimization, and/or mitigation measures specific to the Phase 1 segment are identified.

[8] The Phase 1 limits start at South Grimmer Boulevard (PM 3.4) to include an approximately 1-mile-long auxiliary lane leading up to the start of the HOV/express lane construction at Auto Mall Parkway.

CONSTRUCTION COST

The estimated construction cost of the proposed improvements, in 2014 dollars, for the Build Alternative and Phase 1 is $299,374,000 and $205,789,000, respectively.
The breakdown of the cost is provided in **Table S-1**.

Table S-1 Construction Cost Estimate Summary

	Build Alternative	Phase 1
Roadway	$162,650,000	$97,319,000
Structures	$45,399,000	$38,853,000
Pavement Rehab	$ 14,068,000	$ 14,068,000
Time Related Overhead	$2,063,000	$1,375,000
Contingency (20%)	$44,840,000	$30,320,000
Right-of-way	$264,000	$264,000
Utility Relocation	$7,290,000	$7,290,000
Environmental Mitigation	$7,800,000	$6,300,000
Tolling System Integration (design, installation, and maintenance)	$15,000,000	$10,000,000
Total Cost	**$299,374,000**	**$205,789,000**

Source: WMH Corporation, 2014

NO-BUILD (NO ACTION) ALTERNATIVE

Under the No-Build Alternative, none of the project features described above would be constructed. The freeway travel lanes along the I-680 corridor would remain as they currently exist. No bridge structures would be widened or replaced. Under the No-Build Alternative, the planned and approved transportation improvements described below may be implemented by local agencies or under other projects (see **Section 2.4.2, Cumulative Analysis**, for a detailed discussion).

The No-Build Alternative includes the potential for these improvements to be implemented through design year 2040. The No-Build Alternative is the baseline for comparing environmental impacts under the National Environmental Policy Act (NEPA).[9]

[9] Under the California Environmental Quality Act (CEQA), the baseline for environmental impact analysis consists of the existing conditions at the time the Notice of Preparation (NOP) or at the time the environmental studies began. Near-term impacts (2020) and long-term impacts (2040) are also considered under CEQA; similar to the No-Build baseline used for NEPA.

- I-680 Ramp Metering Project
- I-680 Pavement Rehabilitation Project[10]
- I-680 Northbound Express Lane Extension (from SR 84 to south of Alcosta Boulevard)
- I-680 Express Lanes Project, Bay Area Infrastructure Financing Authority (BAIFA) (HOV conversion from Rudgear Road to Alcosta Boulevard in the southbound direction and from Alcosta Boulevard to Livorna Road in the northbound direction)
- SR 84 Expressway Widening Project (Ruby Hills Drive to Jack London Boulevard)
- SR 84 Expressway Widening Project (I-680 to Pigeon Pass)
- I-680/I-880 Cross Connector
- I-580 Express Lanes (east of I-680)

Traffic volumes within the project corridor would increase under the No-Build Alternative. The No-Build Alternative would not achieve the project purpose of increasing the efficiency of the transportation system by adding capacity on northbound I-680 between SR 237 and SR 84 to accommodate current and future traffic demand. In addition, the increased traffic volumes without capacity improvements would worsen the traffic congestion and slow traffic flow on the highway and local roadway network, resulting in increased potential for traffic congestion-related collisions.

JOINT CEQA/NEPA DOCUMENT

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA), and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the CEQA and the NEPA. Caltrans is the lead agency under NEPA and CEQA. In addition, FHWA's responsibility for environmental review, consultation, and any other action required in accordance with applicable federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, quite often a "lower level" document is prepared for NEPA. One of the most common joint document types is an EIR/EA. After receiving comments from the public and reviewing agencies, a final EIR/EA will be prepared. Caltrans may prepare additional environmental and/or engineering studies to address comments. The Final EIR/EA will include responses to comments received on the draft EIR/EA and will identify the preferred alternative. If the

[10] Excluding the segment between Auto Mall Parkway (PM M4.0) to Koopman Road (PM R12.4) that would be rehabilitated under Phase 1of the Build Alternative.

decision is made to approve the project, a Notice of Determination (NOD) will be published for compliance with CEQA, and Caltrans will decide whether to issue a Finding of No Significant Impact (FONSI) or require an Environmental Impact Statement (EIS) for compliance with NEPA. A Notice of Availability (NOA) of the FONSI will be sent to the affected units of federal, state, and local government, and to the State Clearinghouse in compliance with Executive Order 12372.

PROJECT IMPACTS

Table S-2 summarizes the adverse 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 full Build Alternative, including the initial phase of construction. Where appropriate, the environmental consequences and avoidance, minimization and/or mitigation measures specific to the Phase 1 segment are identified. For a complete description of potential adverse effects and recommended measures, please refer to the specific sections within **Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures**.

Table S-2 Project Impacts

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Land Use				
Division of and established community	None expected	None expected	None expected	None
Consistency with State, Regional, and Local Plans and Programs	Low	High consistency	High consistency	None
Compatibility with habitat conservation plan	No Conflict	No Conflict	No Conflict	None
Located in a Coastal Zone	No	No	No	None
Located near Wild and Scenic Rivers	No	No	No	None
Parks and Recreation Facilities				
No Effect				
Growth				
Growth-inducing	No	Indirectly, but within planned and forecasted growth	Same as Build Alternative	None
Farmlands				
Farmland acquisition	None expected	Low (1.21 acres of Unique Farmland)	Same as Build Alternative	None
Williamson Act Property Acquisition	None expected	Low (0.07 acres of land under a Williamson Act contract)	Same as Build Alternative	**Measure FRM-1:** Comply with Government Code Section 51293(d); land surface disturbed for the relocation of utilities would be restored to its original conditions

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Community Impacts				
Community Character and Cohesion	None expected	None expected	None expected	None
Relocations and Real Property Acquisition	None expected	No relocations; Acquisition of portions (or slivers) of 13 parcels	Same as Build Alternative	**Measure CMN-1:** Implement community outreach program with affected property owners **Measure TRA-1**: a Transportation Management Plan (TMP) will be given one to two weeks in advance to emergency response services to address detours and roadway/street closures
Environmental Justice	None expected	None expected	Same as Build Alternative	None
Utilities/Emergency Services				
Utilities	None expected	Some relocations of existing gas and electric transmission lines	Same as Build Alternative	**Measure UTL-1:** Coordination and verification with the affected utility service providers
Emergency Services	None expected	Short-term operational effects to police, fire, and emergency service during construction	Same as Build Alternative	**Measure TRA-1:** Implement TMP with notifications of delays and/or detours during construction
Traffic and Transportation/Pedestrian and Bicycle Facilities				
Conflict with applicable plans, ordinances, policies, or programs	Yes	None	None	None
Increase traffic congestion	Yes	Will reduce traffic congestion	Same as Build Alternative	**Measure TRA-1**: Implement TMP with notifications of delays and/or detours during construction

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Increase hazards as a result of a design feature	None expected	None	None	None
Visual/Aesthetics				
Adverse effect on scenic views/damage scenic resources	None expected	None	None	None
Degradation of existing visual character or quality	None expected	Potential visual quality lost	Same as Build Alternative	**Measures VIS-1 through VIS-5:** Roadway design would adhere to Caltrans final design requirements in cooperation with the Caltrans District Landscape Architect
Create a new source of light or glare	None expected	New nighttime lighting; temporary construction lighting	Same as Build Alternative	**Measure VIS-6:** Lighting would adhere to Caltrans Standard Specifications Implement construction light and glare screening measures
Cultural Resources				
Create an adverse change in the significance of a historical resource	None expected	No effect	No effect	None
Create an adverse change in the significance of an archaeological resource	None expected	Potential due to excavation and construction activities	Same as Build Alternative	**Measure CUL-2:** If unidentified cultural materials are unearthed during construction work shall be halted in that area. **Measure CUL-3:** An ESA and AMA Action Plan has been prepared to specify avoidance areas and areas requiring monitoring during construction to avoid all impacts to known archaeological resources

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Disturbance to human remains	None expected	None expected	Same as Build Alternative	**Measure CUL-1:** If human remains discovered, activity will stop (State Health and Safety Code Section 7050.5). If the remains are thought to be Native American, the Native American Heritage Commission will be contacted (Public Resources Code Section 5097.98)
Hydrology and Floodplain				
Within a 100-year floodplain	Yes	Yes	Yes	**Measure HYDR-1:** Implement re-vegetation, storm water treatment, or other requirements as designated by the relevant permits
Expose people/structures to a significant risk of loss	None expected	Low risk; minimal increases in storm water runoff (less than 0.6-percent) and changes in the 100-year water surface elevations (approximately 0.1 foot)	Similar to Build Alternative; minimal increases in storm water runoff (less than 0.1 percent) and changes in the 100-year water surface elevations (approximately 0.1 foot)	None
Water Quality and Storm Water Runoff				
Result in substantial drainage pattern alteration	None expected	Modification/removal of existing drainage structures	Same as Build Alternative	**Measure WQ-1:** Comply with Caltrans National Pollutant Discharge Elimination System permit and Storm Water Management Plan
Violation of water quality standards	None expected	Potential due to excavation and construction activities	Same as Build Alternative	**Measure WQ-1:** Implement Storm Water Pollution Prevention Plan

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Change to groundwater supply or groundwater recharge	None expected	None Expected	Same as Build Alternative	None
Substantially degrade water quality	None expected	Potential construction and operational effects	Same as Build Alternative	**Measure WQ-2 and WQ-3:** Implement Design Pollution Prevention and Treatment Best Management Practices
Geology/Soils/Seismic/Topography				
Expected likelihood of seismic related issues, including ground shaking and liquefaction	Same as Build Alternative	High potential for ground shaking, liquefaction potential varies	Same as Build Alternative	**Measure GEO-1:** Implement Caltrans' seismic design standards, and preparation of geotechnical design reports
Expose people or structures to potential adverse effects	None expected	Worker safety	Same as Build Alternative	**Measure GEO-2:** Comply with Occupational Safety and Health Act Section 5(a)(1)
Mineral Resources	None expected	None expected	None expected	None
Paleontology				
Destruction of paleontological resources (i.e., fossil remains and sites) as a result of ground disturbance	None expected	Potential due to excavation and construction activities in previously undisturbed fossiliferous geologic formations	Same as Build Alternative	**Mitigation Measure PAL-A:** Preparation and implementation of a Caltrans-approved paleontological monitoring and mitigation program.
Hazardous Waste/Materials				
Create a hazard to the environment	None expected	Potential due to excavation and construction activities	Same as Build Alternative	**Measures HAZ-1** through **HAZ-5**: Additional subsurface sampling and proper management of soil/groundwater contaminants; Site Safety Plan; Lead Compliance Plan Follow regulations requiring abatement of asbestos-containing materials and lead-based paint.

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Create a hazard to the public	None expected	None expected	Same as Build Alternative	**Measures HAZ-1** through **HAZ-5**: Additional subsurface sampling and proper management of soil/groundwater contaminants; Site Safety Plan; Lead Compliance Plan Follow regulations requiring abatement of asbestos-containing materials and lead-based paint
Be located on a site which is included on a list of hazardous materials sites, and, as a result, would create a hazard to the public or environment	Same as Build Alternative	Varies throughout project limits, sites on several lists	Same as Build Alternative	**Measures HAZ-1** through **HAZ-5**: Additional subsurface sampling and proper management of soil/groundwater contaminants; Site Safety Plan; Lead Compliance Plan Follow regulations requiring abatement of asbestos-containing materials and lead-based paint
Air Quality				
Operational Emissions	Greater than Build Alternative	Regional and project-level conformity achieved, No considerable net increase of any criteria pollutant (no localized carbon monoxide violations, 3 percent increase in diesel particulate matter, and no substantial increase in emissions for all other Mobile Source Air Toxics)	4 percent increase in diesel particulate matter; no substantial increase in emissions for Mobile Source Air Toxics	None

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Emissions from construction equipment	Unknown	Temporary increases in daily maximum construction emissions (reactive organic gases = 8.1 pounds (lbs)/day; nitrogen oxides = 39.3 lbs/day; exhaust particulate matter (10 microns) = 2.3 lbs/day; exhaust particulate matter (2.5 microns) = 2.0 lbs/day)	Same as Build Alternative	**Measures AIR-1 though AIR-3:** Implement Caltrans Standard Specifications and control measures for construction emissions from the BAAQMD CEQA Guidelines
Noise				
A substantial increase in permanent noise levels	None expected	Potential permanent noise level increases ranging from 0 to 15 dBA (varies throughout project limits)	Same as Build Alternative	**Mitigation Measure NOI-A:** Potential noise abatement measures
A substantial increase in temporary noise levels	None	Potential due to construction activities	Same as Build Alternative	**Measure NOI-1:** Compliance with Caltrans Standard Specifications for construction equipment; restricted construction hours
Energy				
No Effect				
Biological Resources				
Effects to habitat or sensitive natural communities	None	Potential affects to oak woodland habitat (1.22 acres) during and post construction activities	Same as Build Alternative	**Measure BIO-33**: Avoid/minimize impacts to Oak Woodland; **Mitigation Measure BIO-E**: Compensatory mitigation for oak woodlands

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Effects to wetlands and other waters	None	Potential direct impacts (0.26 acres) and indirect water quality effects to wetlands and other waters. A total of 0.14 acres of impacts, all located within Phase 1, are likely to be subject to a Lake and Streambed Alteration Agreement (1602)	Potential direct impacts (0.14 acres) and indirect water quality effects to wetlands and other waters. A total of 0.14 acre of impacts, all located within Phase 1, are likely to be subject to a Lake and Streambed Alteration Agreement (1602)	**Measures WQ-1 through WQ-3:**Temporary and permanent best management practices to protect water quality **Mitigation Measure BIO-A**: Compensatory Mitigation for Jurisdictional Water Features
Effects to sensitive or special status species	None	Direct impacts to habitat types (90.27 acres of temporarily and permanently disturbed habitat, 64.01 acres of which is urbanized/landscaped; 1,074 trees trimmed or removed) with the potential to support Western burrowing owl, Western pond turtle, American badger, dusky-footed woodrat, migratory birds, and bat species See **Table 2.3.1-1**	Similar to Build Alternative (60.31 acres of temporarily and permanently disturbed habitat, 40.28 acres of which is urbanized/landscaped; 920 trees trimmed or removed) See **Table 2.3.1-1**	**Measures WQ-1 through WQ-3:**See above **Measures BIO-1 through BIO-23, BIO-29, and BIO-32:** Requirements for qualified biological monitor(s) during construction, worker environmental awareness training, preventing inadvertent entrapment of animals during construction, implementing seasonal restrictions and work windows for certain construction activities, conducting pre-construction species surveys, minimization of bat and bird disturbance, proper vehicle use near sensitive natural communities, limiting nighttime construction and artificial nighttime lighting, maintaining good housekeeping practices regarding food-related trash items and pets, restricting firearms, implementing local tree

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
				preservation policies, and implementing colonial bird nesting deterrence plan **Measure BIO-28:** complying with the Executive Order on Invasive Species (EO 13112). **Measures WQ-1 through WQ-3**: See above **Measures BIO-1 through BIO-23, BIO-29 and BIO-32:** see above
		Potential effects to the California tiger salamander (24.76 acres), California red-legged frog (26.26 acres) and Alameda whipsnake (26.09 acres)	Similar to Build Alternative; Potential effects to the California tiger salamander (19.81 acres), California red-legged frog (20.03 acres) and Alameda whipsnake (19.92 acres)	**Measures BIO-24 through BIO-27**: adherence to the conservation measures and terms of the biological opinion, suspend construction activities if special-status species observed in construction areas, implementing seasonal restrictions and work windows for certain construction activities, and restrict the use of plastic monofilament netting (erosion control matting)
Effects to sensitive or special status species *(Continued)*		Potential effects to central California coast DPS steelhead habitat, if downstream anadromous fish passage in Alameda Creek is restored prior to completion of the Build Alternative.	Potential effects to central California coast DPS steelhead habitat, if downstream anadromous fish passage in Alameda Creek is restored prior to completion of the Build Alternative.	**Mitigation Measures BIO-B, BIO-C, and BIO-D:** Compensatory mitigation for impacts to California tiger salamander, California red-legged frog, and Alameda whipsnake

Environmental Topic	No-Build Alternative	Build Alternative	Phase 1	Avoidance, Minimization, and/or Mitigation Measures
Effects to sensitive or special status species *(Continued)*				**Mitigation Measure BIO-F:** potential compensatory mitigation for impacts to central California coast DPS steelhead habitat
Conflict with local policies/plans	None	None	None	None

COORDINATION WITH PUBLIC AND OTHER AGENCIES

NOTICE OF PREPARATION AND SCOPING

"Scoping" is the process of determining the scope, focus, and content of an environmental document. The scoping process allows agencies and other interested parties to provide input on the proposed project, range of alternatives, topics being evaluated, environmental effects, methods of assessment, and mitigation measures being considered.

Scoping for this project included the use of several channels of communication, including the Notice of Preparation (NOP), mailers, internet, and newspaper ads. In addition, two public scoping meetings were held to solicit comments from agencies and the community. All efforts were conducted to meet Caltrans Title VI goals to prevent discrimination. The scoping meetings were held on Wednesday, October 3, 2012 at Hearst Elementary School in Pleasanton between 6:30 PM and 8:30 PM and on Thursday, October 4, 2012 at Chadbourne Elementary School in Fremont from 6:30 PM to 8:30 PM.

A Public Attendee Observation Tally Sheet was completed by Caltrans staff for each scoping meeting. The tally sheet is used to obtain statistical data on the people attending the meetings. Observation on gender, ethnicity, disabilities, and age were made and documented. Based on personal observation and the information recorded on the tally sheets, a total of 22 people attended both meetings; 5 females and 17 males, of which, all were non-Hispanic ethnicity. No attendees had a physical disability. All attendees were over the age of 40 except for one individual.

The scoping meetings were organized in open house format, with informational stations displaying exhibit boards staffed by representatives from Caltrans, Alameda CTC and its consultant staff. The exhibit boards portrayed the following subjects: project map, description of proposed project, how express lanes work, express lane access options being studied, the environmental process, environmental studies to be performed, project timeline, and proposed improvements throughout the I-680 corridor. The public was encouraged to ask questions and to fill out and submit comment sheets at the meeting, or by mail or e-mail before the close of the scoping period (October 16, 2012).

A total of 20 comments were submitted at the meetings, by mail, or by email. Meeting attendees also provided verbal comments to the project team. Additionally, two letters were received from local agencies, including the Alameda County Water District and the City of Pleasanton. Common issues raised during the scoping process included aesthetics, air and water quality, the environmental document, the auxiliary lanes, noise, funding, timeline, safety, and traffic. Relevant CEQA and NEPA-related comments are addressed in **Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures** and **Chapter 3.0, California Environmental Quality Act (CEQA) Evaluation** of this draft EIR/EA.

The concern of downstream traffic, air quality, and noise, impacts, as well as traffic congestion along and through Pleasanton was raised by the City of Pleasanton during the scoping process. The evaluation of downstream impacts and effects on the local circulation system within Pleasanton has been evaluated and is presented in **Chapter 4.0, Comments and Coordination**.

NECESSARY PERMITS AND APPROVALS

Table S-3 identifies the permits/approvals that would be required for project construction.

Table S-3 Permits and Approvals

Agency	Permit/Approval	Status
United States Army Corps of Engineers	Section 404 Permit – Nationwide	Issued during the final design phase
United States Fish and Wildlife Service	Biological Opinion	Issued prior to project approval
California Department of Fish and Wildlife	1602 Streambed Alteration Agreement	Issued during the final design phase
	Incidental Take Permit	Issued during final design phase
Regional Water Quality Control Board	Section 401 Certification	Issued during the final design phase
State Historic Preservation Officer (SHPO)	Concurrence on Eligibility Determinations/Finding of No Adverse Effect with Standard Conditions – Environmentally Sensitive Area (ESA)	Concurrence issued January 13, 2014
Metropolitan Transportation Commission (MTC) Air Quality Conformity Task Force/ Federal Highway Administration (FHWA)	Regional Air Quality Conformity	MTC Determination July 18, 2013 FHWA Determination August 12, 2013
	Project-Level Air Quality Conformity	MTC Determination October 25, 2012 FHWA Determination Pending
Department of Conservation	Notification of Public Acquisition of Williamson Act Land	Notification Letter Sent October 30, 2014

Source: Circlepoint, 2014

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List of Acronyms

AB	Assembly Bill
AADT	annual average daily traffic
ABAG	Association of Bay Area Governments
Alameda CTC	Alameda County Transportation Commission
ALA	Alameda County
AMA	Archaeological Monitoring Action Plan
APE	area of potential effect
ARB	California Air Resources Board
ASR	Archaeological Survey Report
AT&T	American Telephone and Telegraph
BA	Biological Assessment
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BATA	Bay Area Toll Authority
BSA	Biological Study Area
BMPs	Best Management Practices
BO	Biological Opinion
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife (formerly California Department of Fish and Game)
CEC	California Energy Commission
CalEPA	California Environmental Protection Agency
CESA	California Endangered Species Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
CGS	California Geologic Survey
CHP	California Highway Patrol
CIA	Community Impact Assessment
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CPA	Conservation Program Application
CWA	Clean Water Act

CO	carbon monoxide
CO_2	carbon dioxide
CTC	California Transportation Commission
dB	decibel
dBA	A-weighted decibel
DSA	Disturbed Soil Area
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Environmentally Sensitive Area
ETS	Electronic Tolling System
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRM	Flood Insurance Rate Maps
FMMP	Federal Mapping and Monitoring Program
FONSI	Finding of No Significant Impact
FPI	Freeway Performance Initiative
FPPA	Farmland Protection Policy Act
FSTIP	Federal Statewide Transportation Improvement Program
FTA	Federal Transit Administration
GHGs	Greenhouse gases
H_2S	Hydrogen Sulfide
HCP	Habitat Conservation Plan
HOV	high occupancy vehicle
HPSR	Historic Property Survey Report
HRER	Historic Resources Evaluation Report
I-80	Interstate 80
LCFS	Low Carbon Fuel Standard
Leq	The average A-weighted noise level during the measurement period
L_{max}	The maximum A-weighted noise level during the measurement period
LEDPA	least environmentally damaging practicable alternative
LOS	Levels of Service
LPR	License Plate Recognition
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendent
MMI	Modified Mercalli Intensity

MTBE	Methyl Tertiary Butyl Ether
MOEs	Measure of Effectiveness
MPO	Metropolitan Planning Organization
MS4s	Municipal Separate Storm Sewer Systems
MSAT	Mobile Source Air Toxics
MTC	Metropolitan Transportation Commission
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NADR	Noise Abatement Decision Report
NAHC	Native American Historic Commission
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic Atmospheric Administration
NOAA Fisheries Service	National Marine Fisheries Service
NOD	Notice of Determination
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Act
PA	Programmatic Agreement
Pb	lead
PCA	Project construction area
PG&E	Pacific Gas & Electric
PM	particulate matter
PMT	Person Miles of Travel
POAQC	projects of air quality concern
PQS	Professionally Qualified Staff
PRC	Public Resources Code
PSR	Project Study Report
RAP	Relocation Assistance Program
RCSC	Regional Customer Service Center
ROW	Right of Way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board

RCRA	Resource Conservation and Recovery Act of 1976
SCL	Santa Clara
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water District
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	State Route
SSCLJPA	Smart Carpool Lane Joint Powers Authority
ST	short-term
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TASAS	Traffic Accident Surveillance and Analysis
TBA	Targeted Brownfields Assessments
TDC	Toll Data Center
TIP	Transportation Improvement Plan
TMDL	Total Maximum Daily Loads
TMP	Traffic Management Plan
TOAR	Traffic Operation Analysis Report
TOS	Traffic Operating System
TSCA	Toxic Substances Control Act
TSM	Transportation Systems Management Measures
US	United States
USC	United States Code
USD	Union Sanitary District
UST	Underground Storage Tank
U.S. EPA	United States Environmental Protection Agency
USACE	Unites States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	Unites States Geological Survey
VMT	vehicle miles traveled
VOCs	volatile organic compounds
VTA	Santa Clara Valley Transportation Authority
VTMS	Variable Toll Message Signs
WDRs	Waste Discharge Requirements
WPCP	Water Pollution Control Plan

1.0 PROPOSED PROJECT

1.1 INTRODUCTION

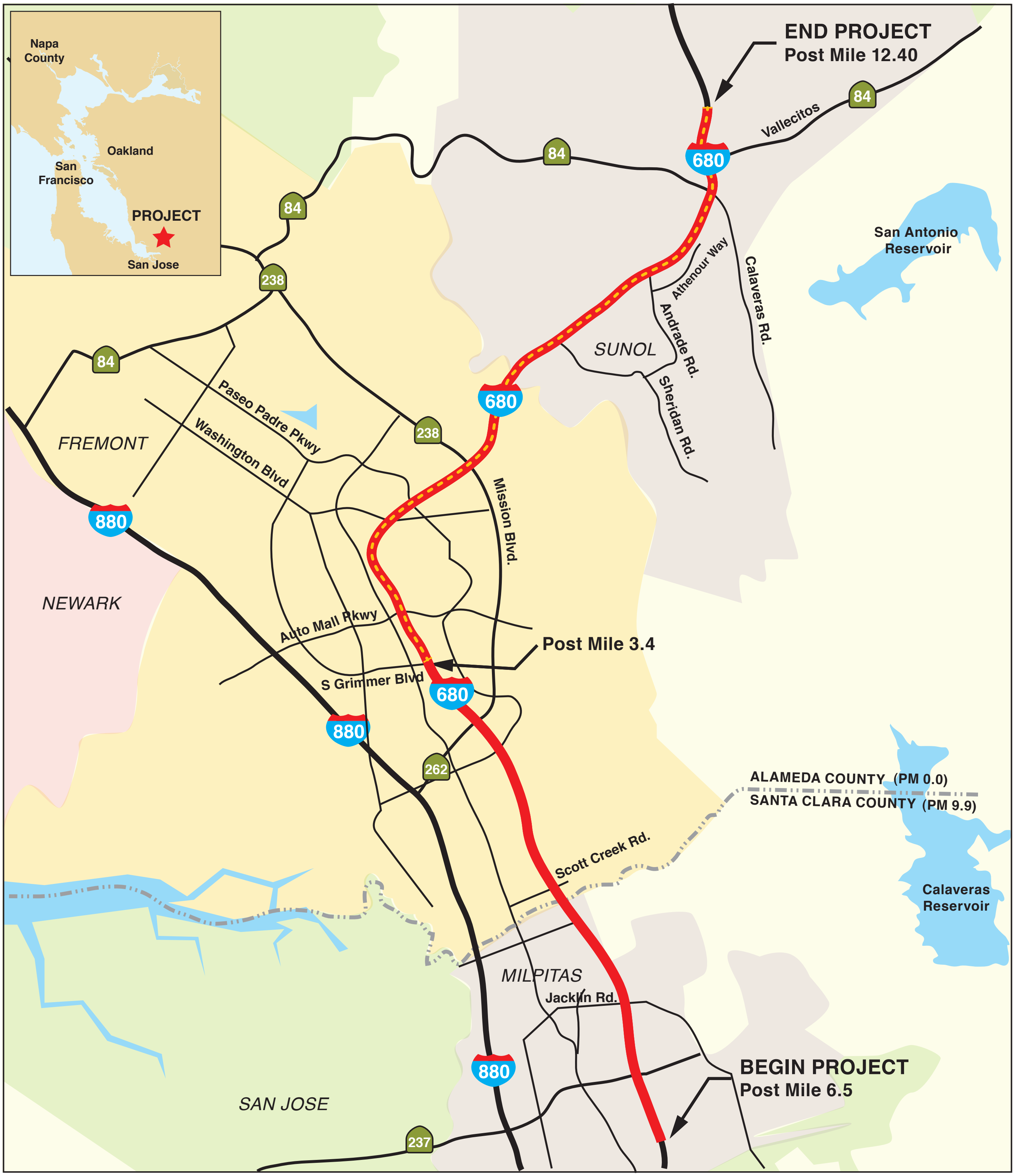
The California Department of Transportation (Caltrans), in cooperation with the Alameda County Transportation Commission (Alameda CTC) and Federal Highway Administration (FHWA), propose to construct an approximately 15-mile High Occupancy Vehicle/express lane (HOV/express lane) project on northbound Interstate 680 (I-680) from south of State Route (SR) 237 in Santa Clara County to north of SR 84 (Vallecitos Road) in Alameda County. The HOV/express lane would be a specially-designated freeway lane that is free for carpools and other eligible HOV users, but also gives single-occupancy-vehicles the option to pay tolls to use the HOV/express lane. **Figure 1-1** shows the general location of the proposed improvements extending along I-680 from Post Mile 6.5 to 9.9 in Santa Clara County, and Post Mile 0.0 to 12.4 in Alameda County. The new HOV/express lane would pass in or near the cities of Milpitas, Fremont, and Pleasanton, and the community of Sunol. The I-680 Sunol Smart Carpool Lane Joint Powers Authority (SSCLJPA) would operate the express lane.[1]

Caltrans is the lead agency for preparing the environmental document in compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA).

PROJECT HISTORY

The I-680 corridor is a major north-south transportation corridor between Santa Clara and Alameda Counties serving commuter, commercial, and recreation traffic. Beginning in 1994, traffic volumes over the Sunol Grade segment of I-680 began increasing steadily and by the spring of 1995, it was considered the second most congested corridor in the Bay Area. Traffic volumes increased dramatically due to strong job growth in Silicon Valley and the surrounding South Bay and limited affordable housing in the immediate area. The nearest available affordable housing was in the Tri-Valley (Dublin, Livermore, Pleasanton), East Contra Costa County, and the San Joaquin Valley areas. Consequently, I-680 became the commuting route of choice since few other options were available. Despite the recent

[1] In 2004, the State Legislature passed Assembly Bill (AB) 2032, authorizing two pilot express lanes in Northern California. The Streets and Highway Code Section 149.5, established the SSCLJPA, and further authorized the SSCLJPA and its members, consisting of Alameda CTC (formerly ACCMA and ACTIA), and Santa Clara Valley Transportation Authority (VTA) to conduct, administer, and operate a value pricing HOV program in the I-680 corridor in Alameda and Santa Clara counties.



Legend

Project Study Limits

Phase 1 Project Study Limit

Project Location Map

Figure 1-1

Source: Circlepoint, 2014

economic downturn, employment remains strong in Silicon Valley and the surrounding South Bay, and travel demand, in general, is expected to increase and compound existing traffic congestion in this corridor.

An interim southbound I-680 HOV lane was completed in November 2002 between SR 237 and SR 84. Improvements for a 'demonstration project' under Assembly Bill (AB) 2032 to convert the southbound HOV lane to an HOV/express lane within the project limits were completed in September, 2010. Under the demonstration project, the southbound I-680 HOV/express lane provided single-occupancy-vehicles the choice to pay a toll electronically to use the underutilized HOV lane capacity while regular carpoolers (2+ persons per vehicle) continued to use the HOV lane for free.

The southbound HOV lane was converted to an HOV/express lane with new striping, three designated entry and exit points, overhead electronic signs (dynamic message signs or DMS) and an electronic toll collection system, utilizing FasTrak® transponders.

1.1.2 STATE/REGIONAL/LOCAL PLANNING

In early 2006, the Metropolitan Transportation Commission (MTC) began study efforts to determine the feasibility of a regional express lane network in the San Francisco Bay Area. The study examined the institutional, financial, and technical merits of implementing an express lane network, including cost and revenue estimates, as well as design approaches. The corridor analyses found that express lanes over the majority of the identified network were feasible if some flexibility was provided in the design approach for areas with significant physical, environmental, or financial challenges.

On January 1, 2005, Assembly Bill 2032 (AB 2032) authorized the Alameda CTC and Santa Clara Valley Transportation Authority (VTA) to implement express lanes on 280 miles of freeway network. As part of a demonstration program, AB 2032 authorized both agencies to conduct, administer, and operate value pricing programs on two of their congested transportation corridors, including the I-680 corridor within the project limits. AB 2032 originally included a sunset provision that authorized the pilot program to operate for a period not to exceed four years after the agency first collects revenues. California State AB 574; approved October 11, 2007, eliminated the sunset provision in AB 2032 (California Streets and Highways Code Section 149.5), authorizing the program to operate indefinitely.

In 2009, the MTC adopted the Regional Transportation Plan (RTP), *Transportation 2035 - Change in Motion* for the San Francisco Bay Area. The RTP sets forth the agency's vision of "an integrated, market-based pricing system for the region's carpool lanes (via a regional express lane network)" to help manage the demand on mature transportation systems and, as a source of revenue, to fund infrastructure improvements. The MTC 2009 RTP identifies I-680 as a priority corridor and includes the project under Reference Nos. 230681 and

230682. The *Plan Bay Area* succeeded the MTC 2009 RTP on June 18, 2013, and includes an updated list of RTP projects through the year 2040. The proposed project is listed in the *Plan Bay Area* MTC 2013 RTP under Reference No. 22042.

The MTC completed the program-level Project Study Report (PSR) *To Support the Bay Area Express Lane Backbone Network* in September 2011. As part of that study, express lanes on the I-680 corridor were evaluated; the study concludes that implementation of express lanes along the corridor is feasible.

The project is therefore consistent with the MTC Transportation 2035 Plan for the San Francisco Bay Area, and is an element of MTC's "backbone" network for express lanes in the San Francisco Bay Area, as described in MTC's Express Lane Backbone Network PSR. In October 2011, the California Transportation Commission (CTC) authorized MTC to develop and operate 270 additional miles of express lanes. In total, the “backbone” network includes express lane implementation in the following transportation corridors:

- Solano County I-80
- Contra Costa/Alameda County I-80
- Alameda/Santa Clara County I-880
- Santa Clara County SR85/SR237
- Santa Clara/San Mateo County SR101
- Solano/Contra Costa/Alameda County I-680
- Alameda County I-580

Alameda CTC has been implementing express lanes in the I-580 and I-680 corridors.

The project is included in the MTC’s 2013 Transportation Improvement Program (TIP) as project number ALA130034.[2] MTC approved the financially constrained TIP on July 18, 2013. The Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) are expected to approve and incorporate the TIP in to the Federal Statewide Transportation Improvement Program (FSTIP) in 2014.

[2] MTC’s 2013 TIP originally listed the project under TIP ID No. ALA010014, and was revised to ALA130034 as part of Revision 2013-16 (dated May 26, 2014).

1.2 PURPOSE AND NEED

1.2.1 PURPOSE

The MTC Transportation 2035 Plan establishes the implementation of a regional express lanes network to effectively improve throughput and reduce delays on the major travel corridors within the San Francisco Bay Area, including northbound I-680. To address these issues, the proposed project would fulfill the following goals:

- Increase the efficiency of the transportation system on northbound I-680 between SR 237 and SR 84 to accommodate current and future traffic demand
- Improve travel time and travel reliability for all users, including HOV and transit users
- Optimize freeway system management and traffic operations
- Maintain consistency with the provisions defined in AB 2032 and AB 574 to implement an HOV/express lanes system in Alameda County

1.2.2 NEED

CAPACITY AND TRANSPORTATION DEMAND

Current and Future Traffic Demand

Level of Service (LOS) is a measure of traffic conditions and the perception of such conditions by motorists. There are six LOS ratings, ranging from LOS A (free traffic flow with low volumes and high speeds, resulting in low vehicle densities) to LOS F (traffic volumes exceeding the capacity of the infrastructure, resulting in forced flow operations, slow speeds, and high vehicle densities). LOS E or F is typically considered unacceptable by Caltrans, and indicates traffic demand is exceeding available capacity resulting in substantial traffic congestion and a need for improvement. Refer to **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities** and **Figure 2.1-7,** for a detailed discussion of LOS criteria.

The existing roadway features and freeway mainline capacity of northbound I-680 within the project limits are inadequate to accommodate the existing traffic demand.[3] The result is traffic congestion and delay during afternoon peak travel periods, when the corridor serves as a major commute route for people who work in Silicon Valley and live in eastern Alameda County, Contra Costa County, or the northern part of the San Joaquin Valley.[4] **Tables 2.1.7-1**

[3] The freeway "mainline" refers to the general mixed-flow travel lanes that are available to all drivers.
[4] According to 2011 traffic count data, the weekday three-hour peak commute period for the project corridor occurs from 3:45 to 6:45 PM, with the heaviest hour of traffic occurring from 5:15 to 6:15PM.

and **2.1.7-2**, in **Section 2.1.7**, **Traffic and Transportation/Pedestrian and Bicycle Facilities**, of this EIR/EA summarize current and forecast mainline and ramp operations along I-680 within the traffic study area, respectively. For multiple hours in the afternoon peak travel period, substantial traffic congestion occurs between Mission Boulevard (SR 262) and Washington Boulevard, and between Sheridan Road and Calaveras Road (average travel speeds between 24 and 55 miles per hour; LOS E/F conditions).

Projections of future conditions on the I-680 corridor within the project limits indicate that the demand for travel is expected to far exceed the available capacity during peak periods, adversely affecting travel speeds and creating bottlenecks at constrained locations. By year 2020, the bottleneck at Washington Boulevard is expected to cause substantial queuing during much of the evening peak commute period, with the queue extending beyond SR 237. Peak hour operations are expected to be at LOS F from SR 237 up to Washington Boulevard, with average travel speeds between 11 and 21 mph. Slow speeds between 21 and 41 mph (LOS F conditions) are also anticipated between Sheridan Road and SR 84 (Calaveras Road) due to the secondary bottleneck at that location. By 2040 it is projected that the number of vehicles using this segment of I-680 will increase by up to 28 percent. With no improvements, the two bottlenecks effectively merge resulting in a substantial queue that exists for longer than the six-hour peak period and is estimated to extend for about 13 miles south of SR 237.

Travel Time Delay for all Users

Current data on corridor travel speeds indicate that travelers experience substantial delays during the peak period; the time required to traverse the corridor is twice as long as during off-peak periods, and each traveler experiences delays of 15 to 20 minutes when compared to free-flowing conditions. Cumulatively, all of the vehicles during the six-hour evening peak commute period experience a total of approximately 6620 vehicle-hours of delay with an average travel speed of 46 mph (see **Table 2.1.7-3**). These forecasted conditions indicate a level of traffic congestion that is also expected to reduce transit service reliability.

Traffic Diversion and Unused Capacity

Based on fall 2011 traffic counts at all of the ramps, there is a sharp increase in traffic using the Sheridan Road off-ramp and a very similar spike in traffic using the Andrade Road on-ramp on weekdays between the 5:00 and 7:00 PM time period. This indicates a substantial number of drivers (approximately 600 vehicles in the peak hour alone) are choosing to divert off of I-680 and use local roads to avoid congestion on the freeway. Similarly, a large amount of traffic diversion occurs on Mission Boulevard, between SR 262 and SR 238, and on Calaveras Road, between SR 237 and SR 84. In the case of Mission Boulevard, the additional traffic diverted from the freeway is resulting in traffic congestion (LOS F conditions) on city streets during peak commute periods. Traffic diversion is likely to further increase as freeway traffic conditions worsen with anticipated growth, creating even more congestion on city streets during peak commute periods.

Because this corridor primarily serves commuters that tend to follow similar daily and weekly travel patterns, the experience with the southbound HOV/express lane indicates that there is a demand for this type of facility in the northbound direction. Based on future traffic forecasts, the HOV lane usage for the majority of the project limits would be in the range of 700 to 1,300 vehicles per hour during the peak commute periods in year 2020, while the capacity of an HOV lane is approximately 1,650 vehicles per hour. These numbers indicate that while there is substantial demand for an HOV lane, there would be unused capacity in the HOV lane, where the potential exists to "sell" the available capacity to toll-paying single-occupancy-vehicles.

Legislation

On January 1, 2005, AB 2032 authorized the Alameda CTC and VTA to implement express lanes on 280 miles of freeway network. As part of a demonstration program, AB 2032 authorized both agencies to conduct, administer, and operate value pricing programs on two of their congested transportation corridors, including the I-680 corridor within the project limits. AB 2032 originally included a sunset provision that authorized the pilot program to operate for a period not to exceed four years after the agency first collects revenues. California State AB 574; approved October 11, 2007, eliminated the sunset provision in AB 2032, authorizing the program to operate indefinitely. The enabling legislation stipulates that revenue collected from the express lanes will be reinvested in projects and services that provide traffic congestion relief within the express lane corridor.

AB 2032 also includes provisions that require HOV/express lanes to operate at LOS C conditions.[5] This LOS C requirement generally corresponds to a minimum average operating speed of 45 miles per hour (mph) for HOV/express lanes with a speed limit of 50 mph or higher.[6] The minimum LOS C requirement is intended to provide HOV/express lane users with reliable travel times.

1.2.3 INDEPENDENT UTILITY AND LOGICAL TERMINI

Logical termini for a project are defined as rational end points for transportation improvements. These rational end points should facilitate a thorough review of the environmental impacts. A project with independent utility is defined as improvements that are usable and provide a reasonable expenditure even if no additional transportation improvements are made in the area.

[5] California Streets and Highways Code Section 149.5(b); LOS D operating conditions in the HOV lane are only allowed with written approval of Caltrans.
[6] USC Title 23, Section 166(d)(2)

As part of the traffic operations analysis conducted for this project, several configurations of the HOV/express lane beginning and end points were evaluated in order to determine the project configuration that most effectively addressed the identified project needs.[7] In addition to identifying beginning and end points for the new HOV/express lane, the evaluation also considered the identification of an initial construction phase that would provide benefit to the travel corridor at a lower cost than the full project given limited project funding.

Based on the findings of the evaluation, the start and end points for the Build Alternative were defined, as well as the parameters for an initial construction phase as described below.

BUILD ALTERNATIVE

Based on observations from the traffic analysis and the discussions at team workshops, it was determined that the current project limits, extending from SR 237 to north of SR 84 (Vallecitos Road), showed the most substantial benefits in future traffic operations along northbound I-680 through the design year 2040. The selection of these end points will allow for a thorough review of environmental impacts as a result of construction and operation of the Build Alternative as demonstrated throughout this EIR/EA. The current project limits therefore reflect the most logical termini for the northbound I-680 corridor.

The project would result in improvements to the current traffic conditions without any additional improvements being made within or adjacent to the project study area. As such, the project is considered to have independent utility. Furthermore, the project would not restrict considerations of alternatives for other reasonably foreseeable transportation improvements in the area.

PHASE 1 – INITIAL CONSTRUCTION PHASE

The project may be constructed under a single construction contract or in multiple phases. Identification of an initial construction phase that would provide benefit to the travel corridor was evaluated during the traffic operations analysis. Based on the findings of the traffic operations evaluation, an initial construction phase of the project (Phase 1) was defined as the addition of a continuous access HOV/express lane from Auto Mall Parkway to SR 84 (Vallecitos Road) in Alameda County. Phase 1 also includes the construction of an auxiliary lane[8] between Washington Boulevard and Mission Boulevard (SR 238), and an approximately 1-mile-long approach lane from South Grimmer Boulevard to the beginning of the HOV/express lane at Auto Mall Parkway. This first phase of the project would be

[7] Caltrans, 2014n

[8] An auxiliary lane is an extra lane on the entire length of highway between interchanges, giving drivers more time to merge in or out. The lane is created when an entrance ramp meets the highway, and drops out (with an "exit only" sign) to become the ramp at the next exit.

operational by 2020. The parameters for Phase 1 allow for a thorough analysis of environmental impacts associated with the construction and operation of the Phase 1 portion of the project as demonstrated throughout this EIR/EA.

Phase 1 improvements are forecast to result in substantial travel time savings, increasing overall travel speeds by almost 50 percent when compared to the No-Build condition, while also providing LOS C conditions or better in the new HOV/express lane. This indicates that Phase 1 has logical termini and independent utility in providing near-term operational benefits to travelers using the northbound I-680 corridor.

1.3 PROJECT DESCRIPTION

The I-680 Northbound HOV/Express Lane Project would construct an approximately 15-mile HOV/express lane on northbound I-680 from south of SR 237 in Santa Clara County to north of SR 84 (Vallecitos Road) in Alameda County. An HOV/express lane was constructed on the southbound side of this same I-680 corridor. **Figure 1-1** shows the general location of the proposed improvements extending along I-680 from Post Mile (PM) 6.5 in Santa Clara County to PM 12.4 in Alameda County. The new HOV/express lane would pass in or near the cities of Milpitas, Fremont, and Pleasanton, and the community of Sunol. The purpose of the project is to effectively improve throughput and reduce delays within the project limits.

1.3.1 PROJECT ALTERNATIVES

This section describes the proposed action and the design alternatives that were developed to meet the previously identified project purpose and need, while avoiding or minimizing environmental impacts. The alternatives are the “Build Alternative” and the “No-Build Alternative”. Other alternatives were considered but eliminated as none were deemed viable because of physical constraints and feasibility, or because they did not meet the project’s purpose and need (see **Section 1.3.3, Alternatives Considered but Eliminated from Further Discussion**). Caltrans and Alameda CTC are continuing to evaluate additional design refinements that may reduce the project footprint and minimize environmental effects.

The Build Alternative is anticipated to be constructed in multiple phases and represents the long-term vision for build out of the HOV/express lane facility on northbound I-680 from SR 237 to SR 84. A first phase of the Build Alternative (Phase 1) would be implemented that would include the construction of a new HOV/express lane facility on northbound I-680 from Auto Mall Parkway to SR 84 (Vallecitos Road), a distance of approximately 8 miles. Phase 1 also includes the construction of an auxiliary lane between Washington Boulevard and Mission Boulevard (SR 238), and an approximately 1-mile-long approach lane from South

Grimmer Boulevard to the beginning of the HOV/express lane at Auto Mall Parkway. **Figure 1-1** shows the general location of the proposed improvements within Phase 1, extending along I-680 from Post Mile 3.4 to Post Mile 12.4, in Alameda County.[9]

Chapter 2, **Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures**, of this environmental document evaluates the potential effects of the full Build Alternative, including the initial phase of construction (Phase 1). Where appropriate, the environmental consequences and avoidance, minimization and/or mitigation measures specific to the Phase 1 segment are identified.

Under the No-Build Alternative, none of the project features described under the Build Alternative would be constructed. The freeway travel lanes along the I-680 corridor would remain as they currently exist. Under the No-Build Alternative, the planned and approved transportation improvements described below may be implemented by local agencies or under other projects (see **Section 2.4.2, Cumulative Analysis**, for a detailed discussion). The No-Build Alternative includes the potential for these improvements to be implemented through design year 2040. The No-Build Alternative is the baseline for comparing environmental impacts under the National Environmental Policy Act (NEPA).[10]

DESIGN FEATURES OF THE BUILD ALTERNATIVE

The Build Alternative proposes to construct a new HOV/express lane facility on northbound I-680 from SR 237 (Calaveras Boulevard) in Santa Clara County to SR 84 (Vallecitos Road) in Alameda County, a distance of approximately 15 miles. The Build Alternative would consist of the following primary improvements, discussed in detail further below:

- addition of a new HOV/express lane in the northbound direction on I-680 extending from SR 237 in Santa Clara County to Route 84 (Vallecitos Road) in Alameda County
- installation of electronic tolling equipment and signage
- widening of existing I-680 paved surfaces in the median and to the outside of the mainline
- construction of auxiliary lanes at various locations on northbound I-680 to improve weaving operations at both ramp locations and express lane access points
- widening or modification of overcrossing and undercrossing structures to accommodate freeway widening

[9] The Phase 1 limits start at South Grimmer Boulevard (PM 3.4) to include an approximately 1-mile-long approach lane leading up to the start of the HOV/express lane construction at Auto Mall Parkway.
[10] Under the California Environmental Quality Act (CEQA), the baseline for environmental impact analysis consists of the existing conditions at the time the Notice of Preparation (NOP) or at the time the environmental studies began. Near-term impacts (2020) and long-term impacts (2040) are also considered under CEQA; similar to the No-Build baseline used for NEPA.

- demolition and replacement of the Sheridan Road overcrossing
- widening the east side of Alameda Creek Bridge
- construction of retaining walls at various locations to accommodate the northbound widening
- new and replacement soundwalls, as required
- modification of existing ramp metering and installation of Traffic Operations System (TOS) facilities
- pavement rehabilitation on northbound I-680 between Auto Mall Parkway and Koopman Road

Appendix G includes detailed exhibits of the improvements that would be constructed under the Build Alternative.

Specific improvements that are physically located within the Phase 1 segment of the Build Alternative are identified (i.e., auxiliary lanes, bridge modifications, etc.) as appropriate.

HOV/Express Lane Operations

Access

Access is one of the most important design features for express lanes due to impacts associated with operation, performance, enforcement, and tolling requirements. Consistent with other express lanes that are currently being planned and implemented in the Bay Area, the northbound I-680 express lane would allow continuous access between the express lane and the adjacent mixed-flow (general purpose) lane. Under this configuration all eligible users, including HOVs, motorcycles, buses, decal vehicles as authorized by the California Air Resources Board, and toll-paying single occupant vehicles, will be able to access the express lane during the hours of operation. Eligible vehicles with HOV status will continue to use the I-680 northbound express lane for free. Drivers of single-occupancy-vehicles, who value time savings and who want a more convenient and reliable trip, can choose to use the new express lane for a fee. Two-axle, delivery-type trucks will also be allowed to use the new converted facility for a fee, but trucks with 3 or more axles will be excluded from the lane.

Barrier separation of express lanes can be beneficial in controlling locations where there is likely to be substantial amounts of merging in and out of the express lane while the mixed-flow lanes are in queue.[11] That is not the situation on the northbound I-680 corridor, particularly in the near-term; the major merging movements into and out of the express lane will occur in sections where the mixed-flow lanes are expected to flow relatively smoothly, so barrier separation is not anticipated to be beneficial. The new express lane will be designed

[11] Barrier separation is provided by a 2-feet wide double-white pavement stripe

to operate (with toll enforcement) from 5:00 AM to 8:00 PM, Monday through Friday. Outside of these hours, the express lane would operate as a free, general purpose travel lane (see *Dynamic Toll Pricing/Tolling Equipment discussion below*).[12]

Enforcement

Per statutes (Streets and Highways Code, Section 149) HOVs are allowed to use express lanes free of charge. The proposed HOV/express lane would operate with a two-or-more (2+) person per vehicle requirement, as determined by Caltrans. The HOV/express lane would also provide drivers of single-occupancy-vehicles the choice to pay a toll electronically to use underutilized lane capacity while regular HOV users would continue to use the lane for free. The toll rate for single-occupancy-vehicles would be variable depending on the level of traffic congestion and distance traveled.

The tolling operation will be fully electronic, collected from registered motorists who carry in-vehicle-mounted FasTrak® transponders, with no requirement to stop and make cash payments for a trip. Toll violation will be enforced through an automated violation process. License Plate Recognition (LPR) cameras would capture license plate images of vehicles that do not display a recognizable toll transponder.[13] To facilitate violation enforcement, toll gantries will be installed at relatively close spacing, estimated to be one half to three-quarter miles apart.

Although the use of LPR and toll transponders would automate toll violations, the California Highway Patrol (CHP) is responsible for enforcing all laws that apply to the express lanes, including toll and HOV laws. Vehicles with a valid FasTrak® transponder would trigger a transaction indicator beacon. CHP officers would monitor the indicator beacon and observe from a distance whether the identified vehicle is an HOV or single occupancy vehicle (SOV). If the CHP determines that a single-occupancy-vehicle in the express lane does not have a valid FasTrak® transponder, the vehicle may be pulled over and cited.

To allow CHP enforcement of the express lane, protected observation areas would be provided within the freeway median for the officers to safely park their vehicles to conduct occupancy verification and traffic observation. All CHP observation areas would provide directional access to northbound I-680. In general, the CHP observation areas would be

[12] State legislation requires that the express lane hours of operation be consistent with the operating hours of the HOV lane. Therefore, the final decision on operating hours will be recommended by the HOV Lane committee, which is comprised of representatives from Alameda CTC, Caltrans, California Highway Patrol (CHP) and MTC.

[13] Vehicles with two-or-more (2+) persons would be able to use the HOV/express lane for free. In order to avoid being inadvertently being charged as a single-occupancy-vehicle, HOV users would remove the FasTrak® transponders from their windshield and cover it with the Mylar® bag that was provided with the transponder.

approximately 1,400 feet in length and varying 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 observation of traffic. Potential CHP observation areas are identified in **Table 1.3-1**.

Table 1.3-1 Potential CHP Observation Areas

General Location	Post Mile (County)
Phase 1	
Between Auto Mall Parkway and Washington Boulevard	5.1 (Alameda)
Between Vargas Road and Sheridan Road	7.7 (Alameda)
Between Andrade Road and Calaveras Road (SR 84)	9.9 (Alameda)
Future Phases	
Between SR 237 and Jacklin Road	7.8 (Santa Clara)

Source: WMH Corporation, 2014

Dynamic Pricing/Tolling Equipment

Tolls for express lanes are dynamic, meaning they will change periodically based on real-time traffic volumes. During periods of lower traffic congestion, the toll will be lower. The lower toll rates encourage more single-occupant vehicles to pay the toll and make use the additional capacity of the HOV/express lane. During the hours of operation when there is more traffic congestion on the freeway, the toll to access the express lane will be higher. The higher toll rates discourage more single-occupant vehicles from using the HOV/express lane, which frees up at-capacity conditions within the facility. By raising or lowering the toll in response to the level of demand, this dynamic pricing effectively manages the volume of traffic in the HOV/express lane, ensuring that traffic flows smoothly.[14]

The toll collection system for the Build Alternative would be divided into four "toll zones".

- Toll Zone 1 – SR 237 to SR 262 [±4.5 miles]
- Toll Zone 2 – SR 262 to Auto Mall Parkway [±2.0 miles]
- Toll Zone 3 – Auto Mall Parkway to SR 238 [Phase 1; ±2.4 miles]
- Toll Zone 4 – SR 238 to SR 84 (Vallecitos Road) [Phase 1; ±5.4 miles]

[14] Currently, within 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 lower, a minimum of 30 cents. The toll will range from 30 cents to a maximum of $7.50. The express lane is free during non-operational hours (8pm to 5am) and weekends.

When entering a defined express lane toll zone, single-occupancy-vehicles will be charged the dynamic pricing fee assigned at the time of entry. As indicated in the above list, Toll Zones 3 and 4 would become operational in Phase 1.

Each toll zone would include all subsystems relative to toll collection, photographic enforcement for violations, vehicle classification detection, enforcement personnel provision, and communication with the toll integrator's control center.[15] Each toll zone would contain the following equipment serving the toll collection and violation enforcement systems: cantilevered overhead sign structures, antenna, toll reader, vehicle sensors, rear-plate facing camera and electrolier, enforcement beacons, zone controller, hardened and protected utility cabinet, and appropriate protected pavement areas to support enforcement and maintenance personnel. Within the express lane facility, toll reader sign structures will be placed at approximately 0.75 mile intervals to register FasTrak® transponders. **Figure 1-2** illustrates the gantry/reader structure that would support the tolling equipment.

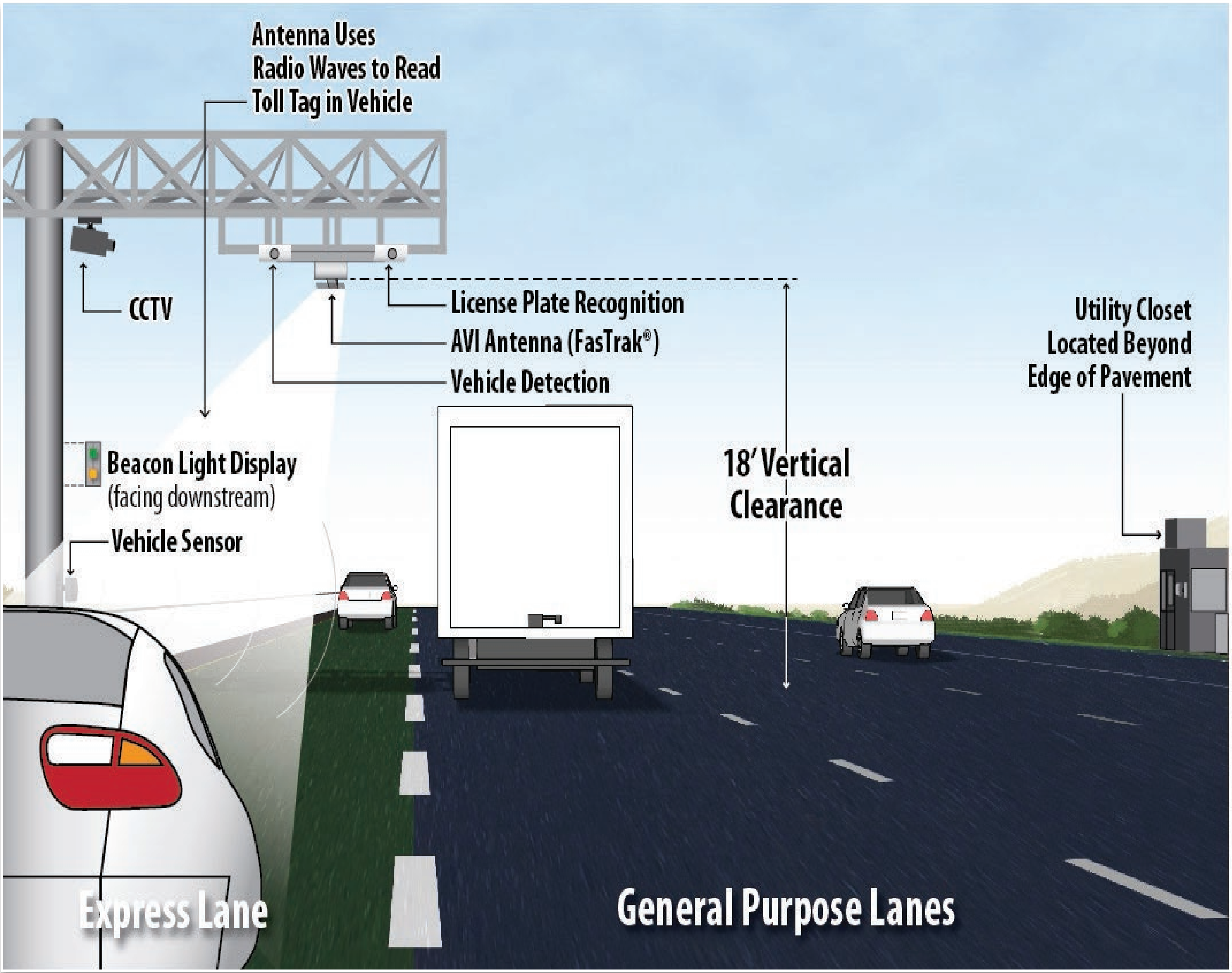
Signage

The 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. A total of 64 overhead sign structures are proposed for this project; 24 existing guide signs will be replaced and 40 new signs are being proposed. Of these, 42 overhead sign structures are proposed within Phase 1 (19 replacements and 23 new signs).

Smaller signs would be median-mounted on the existing freeway concrete median barrier, while larger signs would be mounted on cantilevered overhead sign structures spanning above the express lane. 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:

- *Static/Non-Electrical Signs*
  - *Express Lane Entrance Signs* – 1 mile and 0.5 miles in advance of the express lane entrance, sign panels displaying the express lane operating rules and distance to the express lane entrance would be mounted on overhead sign structures.
  - *Toll Reader Signs* – sign panels indicating HOV and Fastrak® use only would be placed approximately 0.75 mile apart within each toll zone and no more than 0.5 miles after each VTMS. The overhead sign structures would also include toll reader and toll enforcement equipment.

[15] Each electronic tolling system would be linked to a Toll Data Center (TDC) that collects and records toll data. The TDC would be owned and operated by the Sunol Smart Carpool Lane Joint Powers Authority (SSCLJPA). The TDC then transfers toll data to the existing Regional Customer Service Center (RCSC) operated by the Bay Area Toll Authority (BATA), which would handle payment processing.



Tolling System Design and Operations

Figure 1-2

Source: WMH, 2013

- *Variable Toll Message Sign (VTMS)* – Electronic message signs would display two prices; one for the zone the driver is in, and the other for traveling to end of the express lane facility. These prices would be guaranteed, regardless of whether or not they change during the driver's trip as a result of increased (or decreased) levels of traffic congestion in the express and general purpose lanes. VTMS signs will also notify HOV users they are allowed to use the express lane facility free of charge.

  These signs would be mounted on overhead sign structures and be located at approximately 2 mile spacing with additional signs placed in advance of the express lane facility and near on-ramps with heavy traffic volumes. **Figure 1-3** provides an illustration of the type of VTMS signs that would be installed along the I-680 northbound express lane.

  With the exception of the smaller, median mounted signs, all overhead sign structures would have a maximum height of approximately 35 feet and be either supported on a cast-in-drilled-hole pile foundation, or supported on a retaining wall structure.

Widen I-680 to Provide a New HOV/Express Lane

Within the project study limits, northbound I-680 is currently a three-lane freeway with a truck climbing lane between Mission Boulevard (SR 238) on-ramp and the Mission Grade Inspection Facility, just north of Sheridan Road. Inside and outside freeway widening of existing paved surfaces would be required under the Build Alternative to construct the new HOV/express lane. The widening would generally conform to the existing northbound I-680 roadway alignment, and would require approximately 8 to 24 feet of additional paved surface to the outside shoulders.[16] No new general purpose freeway travel lanes would be constructed as part of the Build Alternative. Outside widening would occur at the locations listed in **Table 1.3-2**.

Table 1.3-2 I-680 Widening

General Location	Average Width of Widening [1]
Phase 1	
NB I-680, from south of Washington Blvd to end of project limits	26 feet
SB I-680, near Sheridan Road	24 feet
NB I-680, Auto Mall Parkway and Washington Boulevard	20 feet
NB I-680, between Mission Blvd (SR 262) and Auto Mall Parkway	20 feet

[16] The specified outside widening width includes replacement of existing paved I-680 shoulder, which varies between 8 and 10 feet.

General Location	Average Width of Widening [1]
Future Phases	
NB I-680, north of East Warren Ave	8 feet
NB I-680, between Scott Creek Road and DWR South	17 feet
NB I-680, off-ramp to Scott Creek Road	10 feet
NB I-680, between Jacklin Road and Scott Creek Road	16 feet
NB I-680, between Calaveras Boulevard and Jacklin Road	8 feet

Source: WMH Corporation, 2014
Note: NB = northbound; SB = southbound; DWR = Department of Water Resources

1. The specified outside widening width includes replacement of existing paved I-680 shoulder, which varies between 8 and 10 feet.

The roadway cross section would consist of 12-foot traveled lanes and 10-foot outside shoulder widths. The existing truck climbing lane would be maintained. The median shoulder width would vary from 10-foot to 27-foot (except between Auto Mall Parkway and Washington Boulevard where the northbound and southbound roadway follow separate alignments and at CHP enforcement locations where the median shoulder varies from 3-foot to 10-foot) with a concrete median barrier.

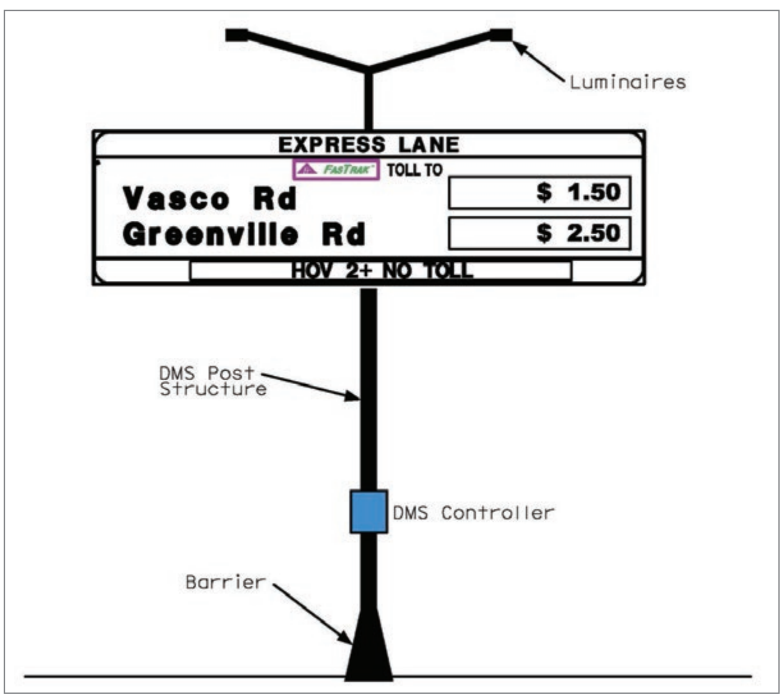
Within Phase 1, the widening would generally occur within the median between SR 237 and just south of Washington Boulevard; and to the outside from SR 262 to the northerly project limits. The southbound freeway would also be widened at the Sheridan Road interchange to accommodate construction of the Sheridan Road overcrossing and provide standard lane widths. Widening associated with the future phases of the Build Alternative would generally occur within the median and to the outside between SR 237 and South Grimmer Boulevard.

Fencing would be erected at the edges of the freeway right-of-way to accommodate additional right-of-way or where temporary construction easements are required. Caltrans standard wire mesh or barbed wire fencing would be utilized.

Auxiliary Lanes

An auxiliary lane is an extra lane on the entire length of freeway between interchanges, giving drivers more time to merge in or out. The lane is created when an entrance ramp meets the freeway, and drops out (with an "exit only" sign) to become the ramp at the next exit. There are existing northbound auxiliary lanes between SR 237 and Jacklin Road and between SR 84 (Calaveras Road) and SR 84 (Vallecitos Road). The construction of the new northbound auxiliary lanes listed in **Table 1.3-3** are proposed to improve weaving operations between ramp and mainline movements. Phase 1 of the Build Alternative would include the construction of the auxiliary lane between Washington Boulevard and Mission Boulevard

Existing Southbound I-680 Express Lane Signage



Example VTMS Sign Structure

Variable Toll Message Sign (VTMS)

Figure **1-3**

Source: WMH, 2013; Caltrans, 2013o

(SR 238). All of the other new auxiliary lanes would be constructed as part of the future phases of the Build Alternative.

The auxiliary lanes would be constructed adjacent to the outside freeway lane between interchange on- and off-ramps. The existing truck climbing lane would be maintained between Mission Boulevard (SR 238) and the Mission Grade Truck Scales off-ramp.

Modified/Replaced Structures and other Roadway Improvements

Table 1.3-4 identifies the fourteen overcrossing and undercrossing structures that would be widened or modified to accommodate widening of northbound I-680.

Table 1.3-3 Northbound I-680 Auxiliary Lanes

General Location	Post Miles (PM)	County
Between Mission Blvd (SR 262) and Auto Mall Pkwy	M2.58 to M3.78	Alameda
Between Auto Mall Pkwy and Washington Blvd	M4.09 to M5.35	Alameda
Between Washington Blvd and Mission Blvd (SR 238)[1]	M5.63 to R6.25	Alameda
Between Scott Creek Rd and Mission Blvd (SR 262)	M0.7 to M2.06	Alameda
Between Jacklin Rd and Scott Creek Rd	M8.8 to M9.74	Santa Clara

Source: WMH Corporation, 2014
Note: SR = state route
1. Constructed as part of Phase 1 of the Build Alternative

Table 1.3-4 Modified/Replaced Structures

Structure	Post Mile	Bridge No.	Modification/ Replacement (approximate average width of widening)
Phase 1			
Washington Blvd OC	ALA 5.37	33-0361	East abutment ground anchor wall
Paseo Padre Pkwy OC	ALA 5.67	33-0405	East abutment ground anchor wall
Palm Ave OC	ALA 5.91	33-0360	East abutment ground anchor wall
Mission San Jose Separation (SR 238)	ALA 6.38	33-0294	Widen from 22 to 36.5 feet to the outside
Vargas Rd UC	ALA 7.48	33-0306	Widen 15.5 feet to the outside
Sheridan Rd OC	ALA 8.31	33-0307	Replace existing 37-foot-wide bridge with 48.5-foot-wide bridge
Andrade Rd OC	ALA 9.71	33-0295	East abutment ground anchor wall
Alameda Creek Bridge	ALA 10.15	33-0047	Widen 9.5 feet to the outside

Structure	Post Mile	Bridge No.	Modification/ Replacement (approximate average width of widening)
Calaveras Rd Separation	ALA 11.03	33-0351	Widen 16 feet to the outside
Scotts Corner Separation	ALA 11.81	33-0352	Widen 16.5 feet to the outside
Future Phases			
South DWR UC	ALA 0.79	33-0438R	Widen 15 feet in the median
North DWR UC	ALA 1.46	33-0439R	Widen 15 feet in the median
East Warren Ave UC	ALA 1.96	33-0427R	Widen 10 feet in the median
Grimmer Blvd UC	ALA 3.35	33-0429R	Widen 30 feet in the median

Source: WMH Corporation, 2014
Note: OC = overcrossing; UC = undercrossing; DWR = Department of Water Resources

Reconstruct I-680/Mission Boulevard (SR 238) Interchange (Phase 1)

The Phase 1 segment of the Build Alternative would reconstruct the northbound I-680/SR 238 (Mission Boulevard) loop on-ramp and lower Mission Boulevard to provide standard vertical clearance to the widened freeway overcrossing.

Replace I-680/Sheridan Road Interchange (Phase 1)

The Phase 1 segment of the Build Alternative would include replacement of the I-680/Sheridan Road interchange just north of the existing location to provide standard lateral and vertical clearance between the overcrossing and the freeway, and to provide standard lane and shoulder widths in both directions on I-680. The interchange would include a new bridge to convey Sheridan Road over I-680 to Mission Road. It would also include reconstructing the ramps to maintain traffic movements between I-680 and Sheridan Road.

Alameda Creek Bridge Widening (Phase 1)

The Phase 1 segment of the Build Alternative would widen the Alameda Creek Bridge to accommodate the new HOV/express lane and provide standard lane and shoulder widths.

Reconstruct Frontage Road (Phase 1)

The existing frontage road along the east side of I-680 at Athenour Way between south of Alameda Creek and just north of Andrade Road would be realigned to the east to accommodate the freeway widening within the Phase 1 segment of the Build Alternative.

Construct Improvements at Grimmer Boulevard

The future phases of the Build Alternative propose to lower Grimmer Boulevard to provide standard vertical clearance at the freeway undercrossing.

Retaining Walls and Proposed Soundwalls

Extensive retaining walls would be constructed to avoid or minimize the need for additional right-of-way and impacts to environmentally sensitive areas while accommodating the northbound I-680 widening. The proposed widening of I-680 would require construction of 45 new retaining walls including 18 special retaining walls (i.e. soil nail, ground anchor, or soldier pile lagging methods of construction). Of these, 39 new retaining walls, including 18 special retaining walls, would be within Phase 1; 4 walls would be constructed on the southbound I-680 direction near Sheridan Road. Retaining wall heights would vary from 4 to 25 feet. A complete list of the proposed retaining walls is included in **Appendix G** with the detailed exhibits of the improvements that would be constructed under the Build Alternative.

Where necessary to avoid or minimize impacts on adjacent properties and/or sensitive environmental resources, soundwalls may be constructed or modified (see **Section 2.2.7, Noise**). The final decision for soundwall construction would be made upon completion of the project design and the public involvement processes. Retaining walls and soundwalls will be aesthetically treated to blend into the surrounding environment and match nearby adjacent walls.

Construct Bicycle and Pedestrian Facilities

Within the project limits, bicycle and pedestrian travel occurs at the majority of cross street locations. The following improvements to bicycle and pedestrian facilities are proposed within the Phase 1 segment of the Build Alternative:

- class II bicycle lanes (on-street, striped bike lanes) at Sheridan Road and Athenour Way[17]
- signalized intersection modifications at northbound I-680/SR 238 on-ramp termini, reconstruct sidewalk, and install Americans with Disabilities Act (ADA) elements and crosswalk markings

Pavement Rehabilitation

Phase 1 of the Build Alternative would include pavement rehabilitation on northbound I-680 from Auto Mall Parkway (PM M4.0) to Koopman Road (PM R12.4). The purpose of the pavement rehabilitation is to preserve and extend the roadway service life. Pavement rehabilitation includes broken pavement slab replacement; and crack, seat, and overlay (CS&O) processes. The main goal of the CS&O technique is to crack the existing pavement slab into smaller pieces while maintaining aggregate interlock between the sections. The

[17] Per California Streets and Highways Code Section 890.4(b), “Class II bikeways, also known as "bike lanes," which provide a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and crossflows by pedestrians and motorists permitted."

cracking reduces the concrete slabs into sections small enough to reduce horizontal movement, but large enough to maintain structural integrity. After cracking, the new smaller sections are seated (i.e., pressed into place using a pneumatic roller equipment) into the existing base layer to restore contact and limit vertical movement. Seating reestablishes contact and support between the broken slabs and the subbase materials. Where there is asphalt on concrete, the asphalt will be removed before the CS&O process, or replaced with pre-cast slabs.

Pavement rehabilitation would be limited to the existing freeway travel lanes and on- and off-ramps within the project study limits of the Phase 1 portion of the Build Alternative. Pavement rehabilitation for the future phases of the Build Alternative would be implemented as a separate project, and is considered part of the planned and approved transportation projects under the No-Build Alternative.

Ancillary Project Components

Storm water Treatment

The proposed permanent storm water treatment facilities for the Build Alternative would include biofiltration strips, biofiltration swales, and detention basins. Biofiltration is a pollution control technique using living material (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. Detention basins temporarily detain storm water, letting sediment in the storm water settle to the bottom of the basin, before discharging the water through an outlet.

In locations where biofiltration swales do not sufficiently reduce storm water flows off-site, underground detention facilities would be proposed. The underground detention facilities would consist of oversized pipes, ranging from 30 to 60 inches in diameter, upstream of a water quality inlet. These facilities would provide storm water storage and would regulate the discharge to the collecting water bodies.

Electric Conduit

To provide electrical power and communications to the electronic tolling equipment and signage for the express lane facility, electrical and communications conduits and fiber would be extended from existing sources along the outside edge of pavement. Extending electrical and communication conduit and fiber will 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 for drivers during nighttime hours. Lighting would be upgraded at ramp merges and diverges. Lighting will also be added to improve visibility at various locations including the express lane entrance and at toll zone boundaries, locations on the highway where visibility is restricted by barriers, locations where the median width is narrow and drivers may be subjected to headlight glare, and locations where concentrations of nighttime accidents are known to have occurred.

Highway Planting

Replacement planting will be installed in areas where planting is removed by construction activities. Highway planting and irrigation would be installed under a separate construction contract and would begin within two years following completion of the roadway construction contract.

Proposed landscaping within ground disturbed by construction activities will have permanent erosion control applied using native seeds and plants. Some of the existing trees within the project limits that encroach into the clear recovery zone for the freeway facility are considered obstructions and will be removed to improve safety. Replacement trees for these areas will be planted outside of the clear recovery zone.

Other Components

There is currently no functioning ramp metering on northbound I-680 within the project limits. Construction and design development for separate ramp metering contracts are currently underway for installing ramp metering facilities at all northbound on-ramps within the project limits, prior to or during the implementation of the express lane project. As the ramps would be widened and realigned to accommodate the proposed express lanes under this project, the affected ramp metering equipment would be modified or replaced, as necessary. While the Build Alternative would include the installation of ramp metering equipment, the project does not propose, or analyze the effects from the operation of ramp metering in this area. An analysis would be undertaken in a future study by others to capture the corridor-wide effects of ramp metering, and to ascertain the feasibility of their operation.

Right-of-Way Requirements

The existing right-of-way along I-680 generally accommodates the Build Alternative improvements with minor exceptions. The land required for the Build Alternative primarily consists of small, narrow strips (also called slivers) of property frontage and landscaped areas around on- and off-ramps. These sliver acquisitions would be limited to 13 parcels within the project limits including 10 fee acquisitions (1.85-acres), 11 temporary construction easements (1.63-acres), and 4 utility easements (1.99-acres). All of the proposed property acquisitions are located in Phase 1 of the Build Alternative. None of the proposed property acquisitions are in areas where there are existing structures or improvements. No displacement of any residences or businesses would be required. Refer to **Section 2.1.5, Community Impacts**, for a complete discussion of community impacts specific to the Build Alternative.

Construction

If funding for the Build Alternative or initial phase of construction (Phase 1) is secured in the near future, the soonest construction would commence would be in February 2017.

Staging and Temporary Construction Easements

The Build Alternative proposes construction work that is within or immediately adjacent to the I-680 corridor. The majority of the construction areas, including staging required for equipment and materials, follow the proposed alignment of the freeway widening and ramp improvements under the Build Alternative. Additional construction staging and access areas would be needed at Alameda Creek to allow for adequate equipment access when widening the I-680 bridge crossing.

Approximately 102 acres of grading disturbance would be required under the Build Alternative, of which 65 acres would be within Phase 1. As previously discussed under *Right-of-Way Requirements*, approximately 11 temporary construction easements (1.63-acres) outside of the freeway right-of-way would be needed. All of the proposed construction easements are located in Phase 1 of the Build Alternative. Construction would not disrupt existing designated land uses and would remain at a distance from the downtown areas, community centers, and parks and recreational areas. No displacement of any residence or business would be required. Residents and businesses whose access may be temporarily affected will be notified in advance of construction activity. Fencing would be erected at the edges of the freeway right-of-way to accommodate additional right-of-way or where temporary construction easements are required. Caltrans standard wire mesh or barbed wire fencing will be utilized.

The resource study areas identified in this environmental document were preliminarily developed by the design team to include the permanent features that would be constructed under the Build Alternative, as well as equipment staging areas and temporary access areas for construction. Impacts associated with the temporary construction areas are considered in the environmental analyses in **Chapter 2, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures**.

Construction Methods

It is anticipated that the construction of the Build Alternative would require temporary roadway and shoulder closures and detouring, which would be planned for in a Transportation Management Plan (TMP) for use during construction. The plan would include press releases to notify and inform motorists, business community groups, local entities, emergency services, and elected officials of upcoming road closures and detours.

Pavement modifications would typically entail 1 to 2 feet of excavation below the ground surface. Some improvements would entail deeper excavations from the placement of numerous structural pilings, and would be associated with the modification to the existing overcrossing and undercrossing structures previously described. Deeper excavations and the placement of numerous structural pilings would occur at depths of no more than 40 feet below ground surface. The majority of the open excavations throughout the Build Alternative improvement areas would vary from 4 to 20 feet below ground surface. The largest cut and fill slopes would be approximately 25 feet high.

Utility Relocations

The following utility companies have known facilities within the project limits:

- Pacific Gas & Electric (PG&E)
- AT&T
- San Francisco Public Utilities Commission (SFPUC)
- Alameda County Water District
- San Francisco Water District
- Union Sanitary District

The Build Alternative will include utility relocations, as necessary, to construct the above-described improvements. An approximately 200-foot portion of a gas transmission line that crosses I-680 between Vargas Road and Sheridan Road would need to be relocated outside of the freeway right-of-way. Relocation of the gas line would include trenching and installation of new pipeline, and backfilling. A portion of a PG&E overhead electrical transmission lines aligned along the east side of I-680, near Calaveras Road (approximately PM 10.6 to PM 11.0) would be relocated to accommodate widening of northbound I-680 and avoid encroachment of the towers into the freeway right-of-way. The relocation of overhead electrical transmission lines would include placement of temporary wooden poles and power lines and construction of one or two new steel lattice towers.

Avoidance and Minimization Measures

The Build Alternative includes a number of measures that are considered part of the project design that would avoid and minimize effects, to the maximum extent possible, to sensitive species and their habitats within the project study limits. These measures include biological monitoring, worker environmental awareness training, prevention of wildlife entrapment, wildlife exclusion fencing, pre-construction surveys, and other specific measures that would be implemented prior to and during construction activities, and would be included as part of the special provisions of the bid package for the project. These measures are described in full detail in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** of this document.

Transportation System Management and Transportation Demand Management Alternatives

System management strategies increase the efficiency of existing transportation facilities without increasing the number of through lanes. Examples of system management strategies include ramp metering, auxiliary lanes, turning lanes, reversible lanes and traffic signal coordination. System management also encourages a unified urban transportation system that integrates multiple forms of transportation modes such as pedestrian, bicycle, automobile, rail, ferry, and mass transit. Although Transportation System Management measures alone could not satisfy the purpose and need of the project, the following Transportation System Management measures have been incorporated into the Build Alternative for this project:

- constructing auxiliary lanes along I-680
- adding Class II bicycle lanes at Sheridan Road and Athenour Way
- realigning northbound I-680/SR 238 loop on-ramp termini square to the cross street (modify signalized intersection and install ADA elements and crosswalk markings)[18]

There are several transportation demand management strategies within the San Francisco Bay Area that are used to reduce the number of vehicle trips within the I-680 corridor. Rideshare offers carpoolers reduced bridge tolls as well as access to carpool lanes. There are also vanpools for larger groups of commuters. Transportation demand management may also involve the provision of contract funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. Increased vehicle occupancy reduces traffic volumes during peak commuting periods; however, without the construction of the improvements described above, successful implementation of a transportation demand management alternative would not substantially improve the safety and operation of the freeway. Transportation demand management alternative by itself would not satisfy the purpose of the project.

[18] The Americans with Disabilities Act (ADA) set design standards for handicap accessible sidewalks and pedestrian crossings. To allow people with disabilities to cross streets safely, state and local governments must provide curb ramps at pedestrian crossings where walkways intersect a curb. To comply with ADA requirements, the curb ramps provided must meet specific standards for width, slope, cross slope, placement, and other features.

NO-BUILD (NO ACTION) ALTERNATIVE

Under the No-Build Alternative, none of the project features described under the Build Alternative would be constructed. The freeway travel lanes along the I-680 corridor would remain as they currently exist. No bridge structures would be widened or replaced.

Under the No-Build Alternative, the planned and approved transportation improvements described below may be implemented by local agencies or under other projects (see **Section 2.4.2, Cumulative Analysis**, for a detailed discussion). The No-Build Alternative includes the potential for these improvements to be implemented through design year 2040. The No-Build Alternative is the baseline for comparing environmental impacts under the National Environmental Policy Act (NEPA).[19]

- I-680 Ramp Metering Project
- I-680 Pavement Rehabilitation Project[20]
- I-680 Northbound Express Lane Extension (from SR 84 to south of Alcosta Boulevard)
- I-680 Express Lanes Project, Bay Area Infrastructure Financing Authority (BAIFA) (HOV conversion from Rudgear Road to Alcosta Boulevard in the southbound direction and from Alcosta Boulevard to Livorna Road in the northbound direction)
- SR 84 Expressway Widening Project (Ruby Hills Drive to Jack London Boulevard)
- SR 84 Expressway Widening Project (I-680 to Pigeon Pass)
- I-680/I-880 Cross Connector
- I-580 Express Lanes (east of I-680)
- Mission Boulevard Streetscape Improvements (between Verde Way and Mission Creek, Fremont)

1.3.2 FINAL DECISION MAKING PROCESS

After the public circulation period, all comments will be considered, and Caltrans will select a preferred alternative and make the final determination of the project's effect on the environment. In accordance with CEQA, Caltrans will certify that the project complies with CEQA, prepare findings for all significant impacts identified, prepare a Statement of

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[19] Under the California Environmental Quality Act (CEQA), the baseline for environmental impact analysis consists of the existing conditions at the time the Notice of Preparation (NOP) or at the time the environmental studies began. Near-term impacts (2020) and long-term impacts (2040) are also considered under CEQA; similar to the No-Build baseline used for NEPA.

[20] Excluding the segment between Auto Mall Parkway (PM M4.0) to Koopman Road (PM R12.4) that would be rehabilitated under Phase 1of the Build Alternative.

Overriding Considerations for impacts that will not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to project approval. Caltrans will then file a Notice of Determination (NOD) with the State Clearinghouse that will identify whether the project will have significant impacts, if mitigation measures were included as conditions of project approval, that findings were made, and that a Statement of Overriding Considerations was adopted. Similarly, if Caltrans determines the action does not significantly impact the environment, Caltrans, as assigned by FHWA, will issue a Finding of No Significant Impact (FONSI) in accordance with NEPA.

1.3.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER DISCUSSION

The Build Alternative was developed to meet the previously identified project purpose and need, while avoiding or minimizing environmental impacts. Other alternatives were considered but eliminated as none were deemed viable because of the physical constraints and feasibility, or because they did not meet the project's identified purpose and need. Caltrans and Alameda CTC are continuing to evaluate additional design refinements that may reduce the project footprint and minimize environmental effects.

Limited Access Express Lane Alternative

For a limited access express lane facility, the location of ingress or egress points for the express lane is geometrically constrained in order to provide adequate distances for traffic to weave across general purpose lanes between on- and off-ramps. Two design options were considered to provide limited access to an express lane facility between SR 237 and SR 84 (Vallecitos Road).

1. Access locations 'mirrored' from the southbound I-680 express lane facility include:

   - ingress for SR 237 (Calaveras Boulevard)
   - egress to SR 262 (Mission Boulevard)
   - ingress for Auto Mall Parkway
   - ingress for SR 238 (Mission Boulevard) (Phase 1)
   - egress to SR 84 (Calaveras Road and Vallecitos Road) (Phase 1)

2. Access locations opposite to locations for southbound I-680 express lane facility include:

   - ingress for SR 237 (Calaveras Boulevard)
   - egress to Auto Mall Parkway
   - ingress for SR 262 (Mission Boulevard) and Auto Mall Parkway (Phase 1)
   - egress to SR 238 (Mission Boulevard)
   - egress to SR 84 (Calaveras Road and Vallecitos Road) (Phase 1)

Both limited access options would provide the same types of improvements as the Build Alternative except for an additional 12-foot widening to accommodate auxiliary lanes at intermediate access points and to provide a 4-foot-wide striped buffer to separate the express lane from the general purpose lanes between access points.

The limited access express lane alternative was withdrawn from further consideration for the following reasons:

- Increased environmental impacts, right-of-way requirements, and construction costs to accommodate the additional widening.
- Buffer separation of express lanes can be beneficial in controlling locations where there is likely to be substantial amounts of merging in and out of the express lane while the mixed-flow lanes are in queue. However, that is not the situation on the northbound I-680 corridor, particularly in the near-term. The major merging movements into and out of the express lane would occur in sections where the general purpose lanes are expected to flow relatively smoothly, so buffer separation would not be expected to produce substantial benefits in this application.

Hybrid Express Lane Option

Design options were considered that looked at a "hybrid" design in which some segments of the express lane would have limited access while other segments would allow continuous access. Limited access is most beneficial in locations where there is likely to be substantial amounts of merging activity in and out of the express lane while the adjacent mixed-flow lanes are in queue. In this particular I-680 corridor, limiting access in the southern part of the project limits would reduce the accessibility to the express lane from important local interchanges, while limiting access in the northern part of the corridor would provide little benefit because there would be relatively little merging activity. Based on the traffic operations analysis for the project, a "hybrid" design alternative would reduce the project's benefit to the traveling public, and would not meet the project's objective to increase the efficiency of the transportation system.

Northerly Limit Express Lane Alternatives

Design options were considered that ended the express lane south of SR 84, in an attempt to identify a shorter, less costly initial phase of construction that would still provide benefit to the traveling public. Based on the traffic operations analysis for the project, terminating the express lane south of SR 84 would substantially limit the project's benefit. This alternative would not meet the project's objective to increase the efficiency of the transportation system.

Moveable Barrier

The alternative to utilize the southbound HOV/express lane for northbound traffic during the afternoon peak period by using moveable barriers was considered. This alternative was withdrawn from further study due to steep grades, limited storage space in the median for barrier moving equipment, and the risk of the moveable barrier being hit directly due to curvilinear alignment of I-680. High maintenance and operation costs for the moveable barrier facility would also conflict with the project's purpose to defray such costs and ultimately establish a revenue generator to fund express lanes and other future transportation improvements.

Bi-Directional Express Lane

The alternative to construct the HOV/express lane in the median separated by fixed barriers was considered. This alternative would construct the HOV/express lane in the I-680 median, similar to the Build Alternative, but separate the express lane from the general purpose lanes by fixed concrete barriers. Separating the express lane by a barrier allows the lane to be reversed mid-day to accommodate the changing commute direction in the morning and afternoon. This alternative was withdrawn from further study mainly due to introduction of nonstandard shoulder widths and constructability issues at bridge overcrossing locations. Accommodation of this alternative would require freeway widening and a larger project footprint in order to meet the Caltrans design standards. The option will also limit the access from the express lane to the major intersections, as was one of the main concerns from the cities of Fremont and Milpitas. A wider footprint in addition to the physical constraints associated with the existing development along I-680 would result in substantially more adverse environmental effects under this alternative when compared with the Build Alternative.

1.3.4 PERMITS AND APPROVALS NEEDED

Table 1.3-5 identifies the permits and approvals that would be required for project construction.

Table 1.3-5 Permits and Approvals Needed

Agency	Permit/Approval	Status
United States Army Corps of Engineers	Section 404 Permit – Nationwide	Issued during the final design phase
United States Fish and Wildlife Service	Biological Opinion	Issued prior to project approval
California Department of Fish and Wildlife	1602 Agreement	Issued during the final design phase
	Incidental Take Permit	Issued during the final design phase
Regional Water Quality Control Board	Section 401 Certification	Issued during the final design phase

Agency	Permit/Approval	Status
State Historic Preservation Officer (SHPO)	Concurrence on Eligibility Determinations/Finding of No Adverse Effect with Standard Conditions – Environmentally Sensitive Area (ESA)	Concurrence issued January 13, 2014
Metropolitan Transportation Commission (MTC) Air Quality Conformity Task Force/ Federal Highway Administration (FHWA)	Regional Air Quality Conformity	MTC Determination July 18, 2013 FHWA Determination August 12, 2013
	Project-Level Air Quality Conformity	MTC Determination October 25, 2012 FHWA Determination Pending
Department of Conservation	Notification of Public Acquisition of Williamson Act Land	Notification Letter Sent October 30, 2014

Source: Circlepoint, 2014

1.3.5 PROJECT COST AND FUNDING

CONSTRUCTION COST

The estimated construction cost of the proposed improvements, in 2014 dollars, for the Build Alternative and Phase 1 is $299,374,000 and $205,789,000, respectively.
The breakdown of the cost is provided in **Table 1.3-6**.

Table 1.3-6 Construction Cost Estimate Summary

	Build Alternative	Phase 1
Roadway	$162,650,000	$97,319,000
Structures	$45,399,000	$38,853,000
Pavement Rehab	$ 14,068,000	$ 14,068,000
Time Related Overhead	$2,063,000	$1,375,000
Contingency (20%)	$44,840,000	$30,320,000
Right-of-way	$264,000	$264,000
Utility Relocation	$7,290,000	$7,290,000
Environmental Mitigation	$7,800,000	$6,300,000
Tolling System Integration (design, installation, and maintenance)	$15,000,000	$10,000,000
Total Cost	**$299,374,000**	**$205,789,000**

Source: WMH Corporation, 2014

FUNDING

The current estimated total project cost is $380.5 million ($260.7 million for Phase 1), which includes project development, engineering, right-of-way acquisition, utility relocation, construction capital, and construction support. This project is proposed to be funded from the Alameda CTC Measure B Program and from other state and federal funding sources. The proposed project was also included in the 2011 RTP.

The Alameda CTC local sales tax revenue (Measure B) funds have been programmed in the Plan Bay Area Regional Transportation Plan adopted by MTC on July 18, 2013. The Alameda CTC Board has approved $15.5 million in Measure B funds for the project Development Phase of the northbound I-680 Express Lane project. The Alameda County Transportation Expenditure Plan programmed funds from the following sources to complete the Project Development Phase work, right-of-way acquisition, utility relocation, construction administration, and construction costs for this project:

- Alameda Measure B and other local funds; $188 Million
- Transportation Congestion Relief Program; $22 Million

2.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

As part of the scoping and environmental analyses conducted for the project, the following environmental issues were considered but no adverse impacts were identified. As a result, these resource topics are not described further in this document.

Table 2-1 Issues with No Adverse Impacts

Resource Topic	Reasons for No Effect
Coastal Zone	The Build Alternative is not located in the Coastal Zone. As such, no coastal resources would be directly affected by construction or operation of the Build Alternative.
Wild and Scenic Rivers	The Build Alternative is not located near any rivers designated as part of the National Wild and Scenic Rivers System. The closest designated river is the American (Lower) River in Sacramento, and is over 100 miles away. As such, no wild or scenic rivers would be directly or indirectly affected by construction or operation of the Build Alternative.
Mineral Resources	Since the Build Alternative is predominantly located within the existing right-of-way, proposed improvements would not intrude on the current mining operations or the potential availability of local and statewide valuable minerals. Therefore, the Build Alternative would have no effect on existing or potential mineral resources. **Section 2.2.3, Geology/Soils/Seismic/Topography**, includes a detailed discussion of nearby mineral resources deposits for informational purposes.

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2.1 HUMAN ENVIRONMENT

2.1.1 LAND USE

Information in this section is based on the Community Impact Assessment (CIA) prepared for the project (Caltrans, 2014b). As part of the CIA, an expansive review of local plans and policies was conducted to summarize the current and expected development trends in and around the project limits. Plans and policy documents that were reviewed include:

- *Alameda County Bicycle Master Plan for Unincorporated Areas*, 2007 – Bicycle plan for unincorporated areas of Alameda County
- *Alameda Countywide Transportation Plan*, 2012 – Transportation plan for Alameda County
- *Change in Motion: Transportation 2035*, 2009 – Regional Transportation Plan for the nine Bay Area counties
- *City of Milpitas Bikeway Master Plan Update*, 2009 – Bicycle plan for City of Milpitas
- *East County Area Plan*, November 2000 - Alameda County General Plan section guiding development and resource conservation within the East County area
- *General Plan 2030: Vision for Fremont's Future*, December 2011– General Plan for City of Fremont through horizon year of 2030
- *General Plan 2030: Vision for Fremont's Future, Chapter 3, Mobility*, December 2011– The Mobility chapter of the General Plan includes bicycle and pedestrian plans and policies
- *Milpitas General Plan 2010* – General Plan for City of Milpitas through the horizon year of 2035
- *Milpitas Midtown Specific Plan 2008* – Specific Plan guiding development in 50-acre area around Tasman East Tight Rail transit area and future BART extension to Silicon Valley
- *Plan Bay Area* - Includes the Regional Transportation Plan for the nine Bay Area counties; successor to *Change in Motion: Transportation 2035*, 2009
- *Pleasanton General Plan 2005 – 2025*, July 2009 – General Plan for City of Pleasanton through horizon year of 2025
- *Scenic Route Element of the General Plan*, May 1994 – Element of Alameda County's General Plan serving as a guide for local and county-wide planning of scenic routes

- *Valley Transportation Plan 2035,* 2009 – Transportation plan for Santa Clara Valley
- *Warm Springs/South Fremont Community Plan*, in progress – Community Plan to guide development around the future Warm Springs BART Station

EXISTING AND FUTURE LAND USE

Existing Land Use Patterns

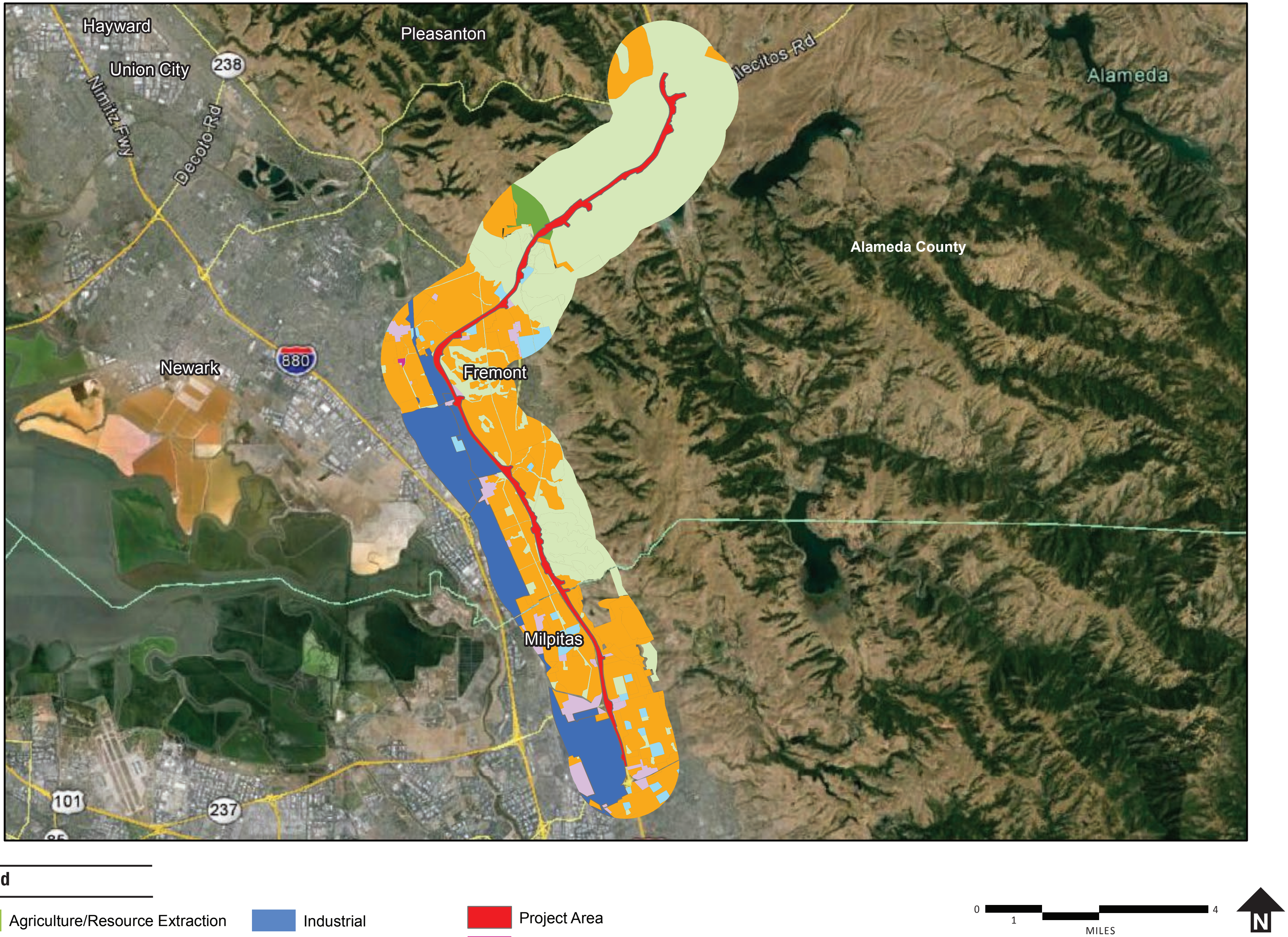
The proposed project is located within a region that varies from urban to rural development patterns, with a diverse mixture of land uses through the cities of Milpitas, Fremont, and the East Bay hills. The land use study area is shown in **Figure 2.1-1**, which includes the proposed project limits and surrounding land uses within 1 mile. The southern portion of the study area, from State Route 237 (SR-237) in Milpitas to the Alameda County line, is surrounded by residential, commercial, office, and public facility uses. Travelling north, through the City of Fremont, the Interstate-680 (I-680) corridor is surrounded by a mix of commercial, industrial, institutional, residential, parks, and open space uses. From the northeastern Fremont hills through the community of Sunol, in unincorporated Alameda County, land uses are predominantly large agricultural properties and open space.

Planned Development

There are 27 planned developments within the land use study area, which are listed in **Table 2.1.1-1**. **Figures 2.1-2a** and **2.1-2b** depict the locations of these development projects in Milpitas and Fremont, respectively. The predominant type of planned development in the study area is residential. Other development projects planned in the study area include several institutional, commercial, and mixed-use commercial/residential land uses. Construction is also underway for two new Bay Area Rapid Transit (BART) stations in the Warm Springs area of Fremont and in downtown Milpitas. Environmental effects of the planned developments listed in **Table 2.1.1-1,** in conjunction with the proposed project, are discussed in **Section 2.4, Cumulative Impacts**.

CONSISTENCY WITH STATE, REGIONAL, AND LOCAL PLANS AND PROGRAMS

The following analysis of the project's consistency with state, regional, and local plans and programs includes those planning documents that are relevant to the proposed improvements (i.e., Regional Transportation Plan (RTP), circulation elements, and conservation documents associated with resources the project could potentially affect).



Land Use Study Area

Figure 2.1-1

Source: Caltrans, 2013a

Table 2.1.1-1 Planned Developments

ID	Name	Location	Description	Use	Status
1	Los Coches Residential	31 South Milpitas Boulevard, Milpitas; south of Calaveras Boulevard and west of South Milpitas Boulevard	The project will construct 80 single-family residential dwellings units on two parcels, totaling 11.3 acres	Residential	Under construction; opening late 2014
2	Sinclair Renaissance	West side of Sinclair Frontage Road, Milpitas; south of the intersection with Los Coches Street	The project will demolish existing structures and construct 80 detached, two-story residential dwellings, totaling 9.65 acres	Residential	Under construction
3	750 E. Capitol Ave. (SD11-0008)	750 E. Capitol Avenue, Milpitas	The project will construct three 12-story towers with 460 dwelling units, totaling 5.6 acres	Residential	Entitlement approved
4	Milpitas Station	1425 S Milpitas Boulevard, Milpitas	The project will construct 303 dwelling units (single family, town homes, and brownstone) on 12.1 acres	Residential	Entitlement approved
5	Citation	1200 Piper Drive, Milpitas	The project will construct 732 residential dwelling units, totaling16 acres	Residential	Entitlement approved
6	Citation II (Montague)	737 Montague Expressway, Milpitas	The project will construct 381 dwelling units and 5,400 square feet of commercial property	Mixed Use	Entitlement approved
7	Our Lady of Guadalupe	41933 Blacow Road, Fremont	The project will construct an addition to a church. The addition would be 4,436 square feet	Institutional	Entitlement approved

ID	Name	Location	Description	Use	Status
8	SVD – Bryant Street	43342 Bryant Street, Fremont	The project would construct a mixed-use development with one commercial building and two single-family residences on a 15,000 square-foot parcel	Mixed Use	Application was received and currently under preliminary review procedure, no entitlement
9	Bringhurst Property	42425 Mission Boulevard, Fremont; along Palm Avenue, approximately 0.5 mile west of I-680	The project would develop a private street, common area landscaping, and 23 single-family dwelling units	Residential	Open for comment; estimated completion is 2014+
10	Mission Creek Planned District	42186 Palm Avenue, Fremont	The project will construct 42 single-family homes on a 15.8-acre site	Residential	Entitlement approved; under building permit review; estimated completion is 2015
11	Mission Olive Homes	1435 Olive Avenue, Fremont	The project will construct 6 single-family residential dwelling units	Residential	Under construction; estimated completion is 2015
12	Washington Lennar.	3111 Washington Boulevard, Fremont	The project will construct 17 new residential units	Residential	Entitlement approved; estimated completion is 2014
13	Hirsch Property	42800 Caldas Court, Fremont	The project will construct 33 single-family homes on 7.85 acres	Residential	Building permit review; estimated completion is 2015
14	Sabercat Neighborhood Center	2501 Cormack Road, Fremont	The project will construct 55,472 square feet of commercial/office space and 158 residential condominium units on a 12.2-acre site	Mixed-Use	Entitlement approved; estimated completion is 2015+

ID	Name	Location	Description	Use	Status
15	Driscoll Road Town Homes	2817 Driscoll Road, Fremont	The project will construct 24 town house-style condominiums	Residential	Entitlement approved; estimated completion is 2014
16	Durham Market Place Property	Northwest corner of Durham Road and Sabercat Road, Fremont	The project will construct a new 7,000 square-foot shopping area on a 1.87-acre site	Commercial	Entitlement approved; estimated completion is 2014+
17	Lancar Townhomes at Warren	411 East Warren Avenue, Fremont	The project would construct 26 new townhouse-study developments on a 1.3 acre parcel	Residential	Open for comment; estimated completion is 2014+
18	Hackamore Planned District	303 Hackamore Lane, Fremont	The project will construct 4-6 existing dwelling units to 35 residential homes on a 2.3-acre parcel	Residential	Under construction; estimated completion is 2014
19	Laguna Commons	41152 Fremont Boulevard	The project would construct a new 4-story, 64-unit affordable/supportive housing development	Residential	Open for comment
20	Villas at Florio	Northeast corner of Fremont Boulevard and Carol Avenue at 41482 Fremont Boulevard, Fremont	The project will construct a new 22-unit townhouse development on a vacant parcel	Residential	Building permit review; estimated completion 2014
21	Convergence House Church	200 Hammond Avenue, Fremont	The project will expand an existing church	Institutional	Entitlement approved; estimated completion 2014
22	Monument Corner	4007 Irvington Avenue, Fremont	The project will construct 6,780 square-foot multi-tenant retail/office building on a vacant lot	Commercial	Under construction; estimated completion 2014

ID	Name	Location	Description	Use	Status
23	Thermofisher Scientific	46500 Kato Road, Fremont	The project will construct a new 275,000 square-foot industrial manufacturing facility on a vacant 22.3-acre parcel	Industrial	Under construction
24	Sisters of the Holy Family	43151 Mission Boulevard, Fremont	The project will develop a 14.8-acre lot with 45 new senior housing and up to 100 new single-family homes	Residential	Open for comment; estimated completion is 2014+
25	St. Joseph	44411 Mission Boulevard, Fremont	The project will construct 16 new single-family homes	Residential	Building permit review; estimated completion is 2014
26	Stengner Development	44009 Osgood Road, Fremont	The project would allow for a 29,180 square foot retail center	Commercial	Open for comment; estimated completion is 2014
27	Central park Terraces (Central park South)	Union Terrace, Fremont	The project will construct 145 detached single-family homes	Residential	Under construction; estimated completion is 2014

Sources: City of Milpitas, Planning Division[1]; City of Fremont, Community Development Department[2]; Caltrans, 2014b

[1] City of Milpitas, Planning Division, Development Projects, accessed from http://www.ci.milpitas.ca.gov/government/planning/planning_division.asp# on April 10, 2014.
[2] City of Fremont, Planning Division, Development Activity Table, accessed from https://www.fremont.gov/index.aspx?NID=411 on April 10, 2014.

Regional Transportation Plans & Transportation Improvement Program

Metropolitan Transportation Commission

In early 2006, the Metropolitan Transportation Commission (MTC) began study efforts to determine the feasibility of a regional express lane network in the San Francisco Bay Area. The study examined the institutional, financial, and technical merits of implementing an express lane network, including cost and revenue estimates, as well as design approaches. The corridor analyses found that express lanes over the majority of the identified network were feasible if some flexibility was provided in the design approach for areas with substantial physical, environmental, or financial challenges.

On January 1, 2005, Assembly Bill 2032 (AB 2032) authorized the Alameda CTC and Santa Clara Valley Transportation Authority (VTA) to implement express lanes on 280 miles of freeway network. As part of a demonstration program, AB 2032 authorized both agencies to conduct, administer, and operate value pricing programs on two of their congested transportation corridors, including the I-680 corridor within the project limits.

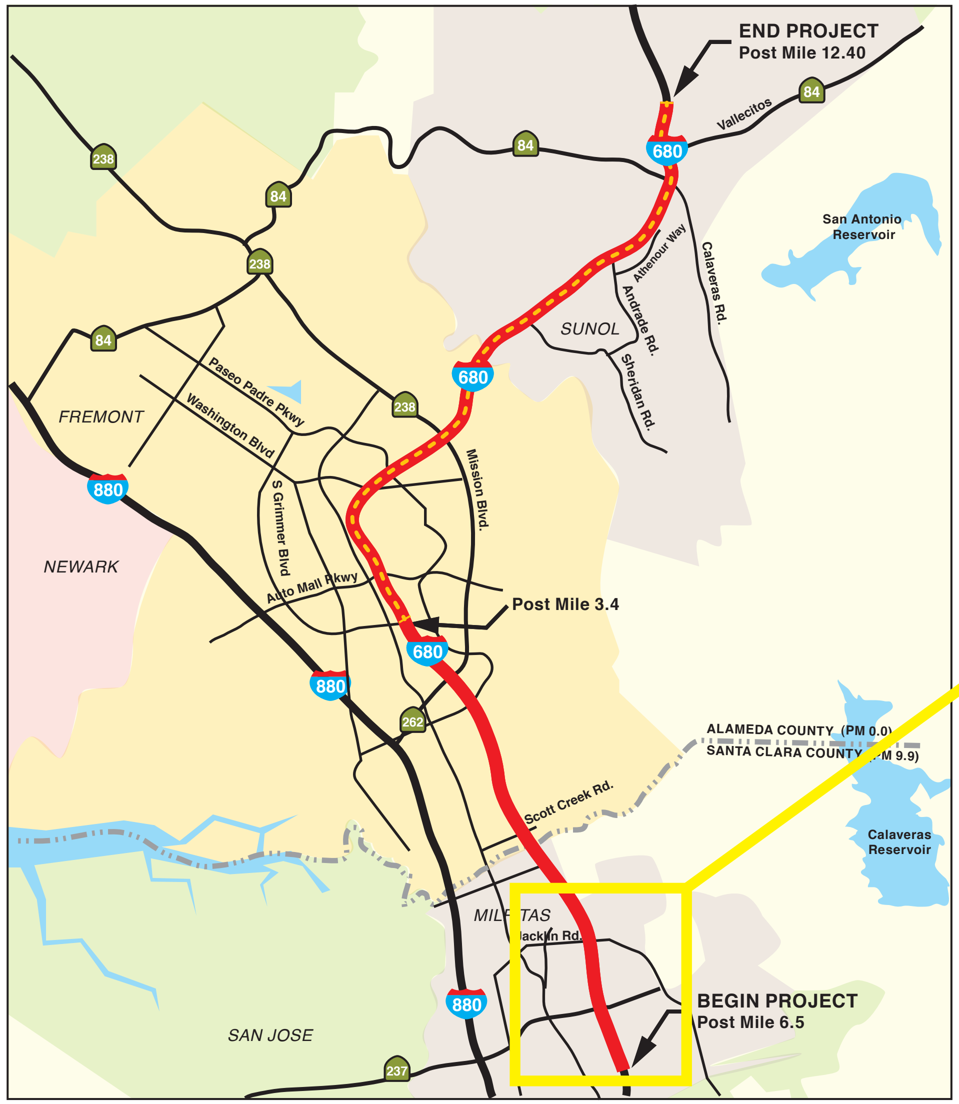
In 2009, the MTC adopted the RTP, Transportation 2035 - Change in Motion for the San Francisco Bay Area. The RTP sets forth the agency's vision of "an integrated, market-based pricing system for the region's carpool lanes (via a regional express lane network)" to help manage the demand on mature transportation systems and, as a source of revenue, to fund infrastructure improvements. The MTC 2009 RTP identifies I-680 as a priority corridor and includes the project under Reference Nos. 230681 and 230682. The MTC 2009 RTP has recently (June 18, 2013) been succeeded by the *Plan Bay Area*, which includes an updated list of RTP projects through the year 2040. The current project is listed in the *Plan Bay Area* MTC 2013 RTP under Reference No. 22042.

The project is included in the MTC 2013 Transportation Improvement Program (TIP) as project number ALA130034. MTC approved the financially constrained TIP on July 18, 2013. The Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) are expected to approve and incorporate the TIP in to the Federal Statewide Transportation Improvement Program (FSTIP) in 2014.

Santa Clara Valley Transportation Authority

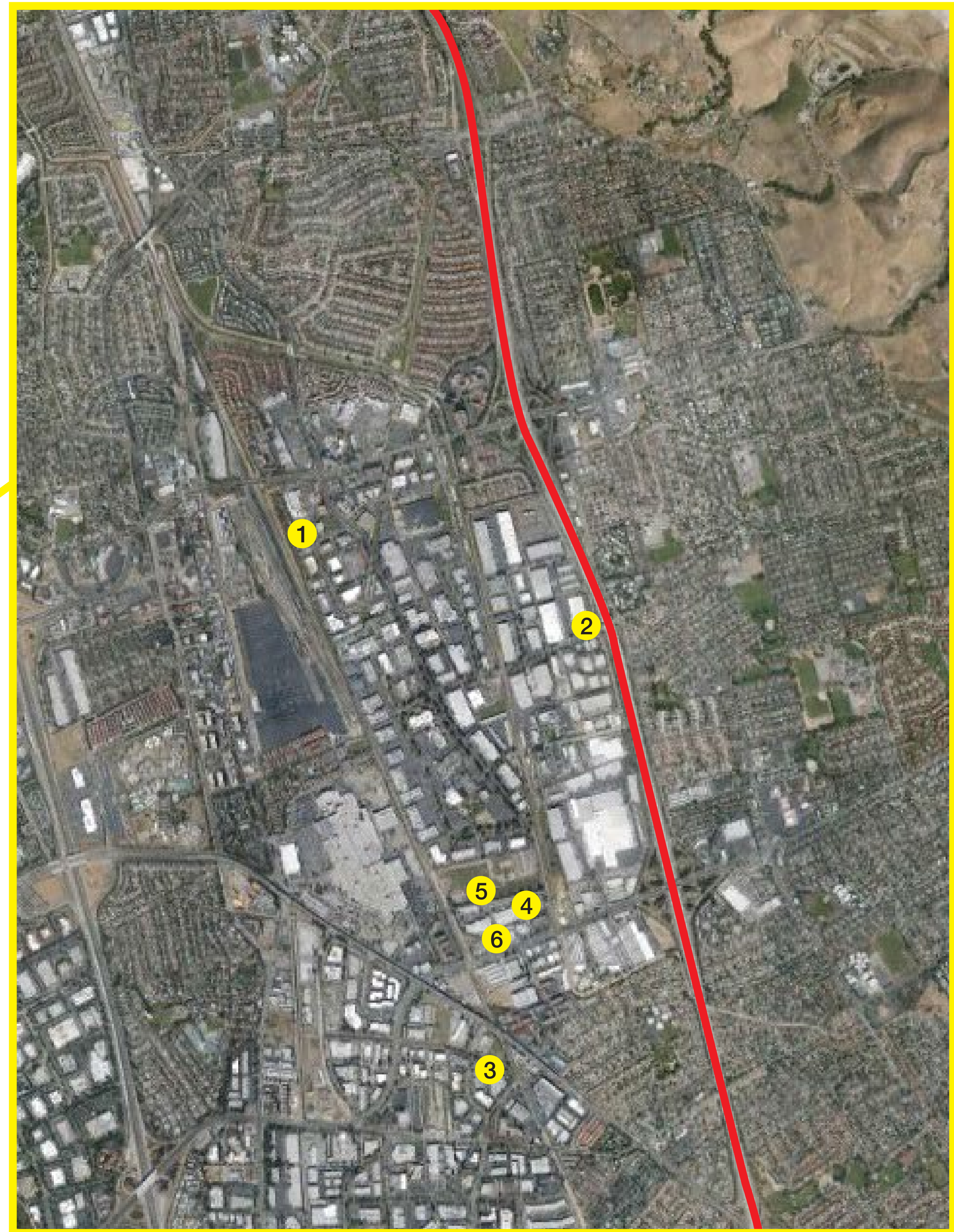
The Santa Clara Valley Transportation Authority's *Valley Transportation Plan 2035* identifies express lane projects as a cost effective means to generate revenue for transportation improvements and reduce traffic congestion. The plan identifies potential for express lanes on I-680 and states that Valley Transportation Authority (VTA) will seek authority to complete the express lane network.[3]

[3] Santa Clara Valley Transportation Authority. Valley Transportation Plan 2035. 2009; 69 <http://www.vta.org/studies/vtp2035/>, accessed on April 1, 2013.



Legend

- Project Study Limits
- R - Residential Development
- C - Commercial Development
- I - Industrial Development



MILPITAS PROJECTS

1. Los Coches Residential (R)
2. Sinclair Renaissance (R)
3. 750 E. Capitol Ave. (SD11-0008) (R)
4. Milpitas Station (R)
5. Citation (R)
6. Citation II (Montague) (R/C)

Milpitas Planned Developments

Figure 2.1-2a

Source: Circlepoint, 2014

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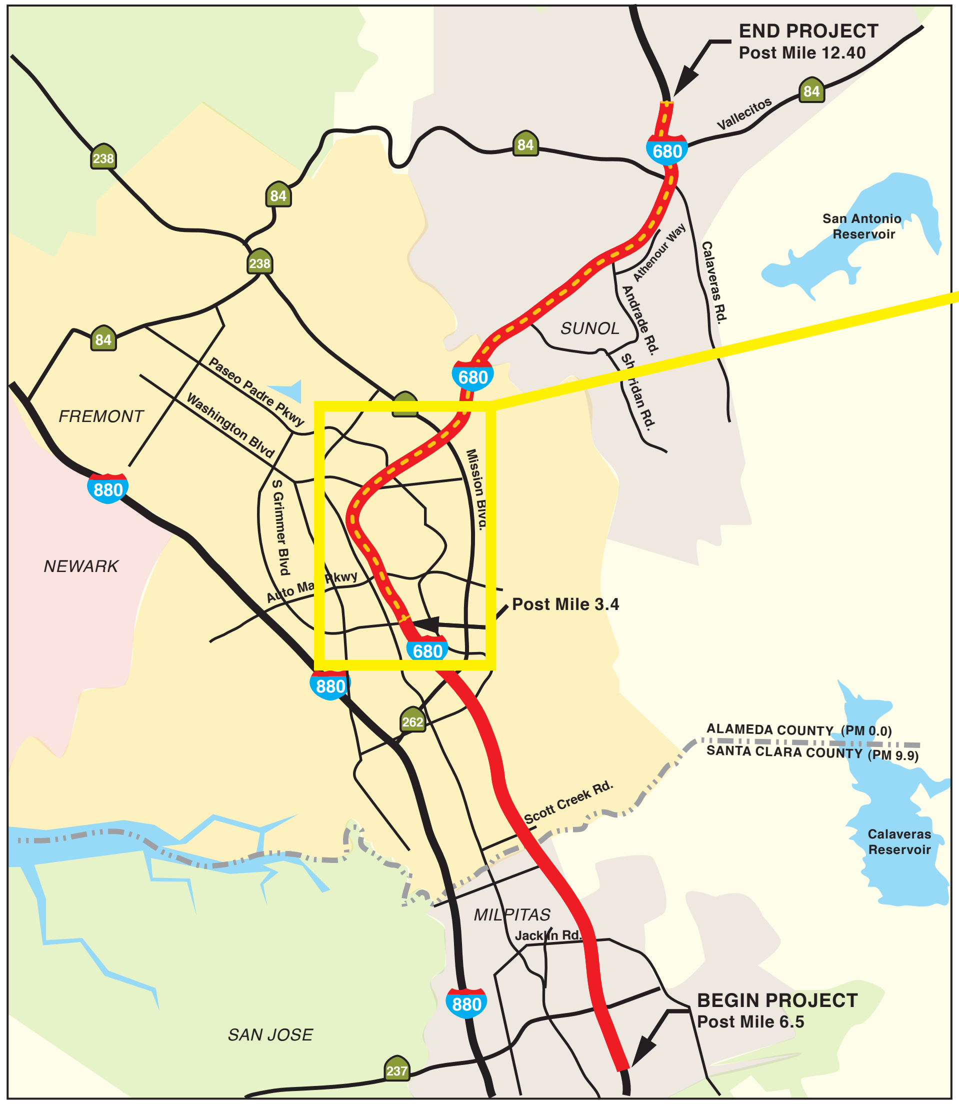

FREMONT PROJECTS

7 Our Lady of Guadalupe (I)
8 SVD – Bryant Street (R/C)
9 Bringhurst Property (R)
10 Mission Creek Planned District (R)
11 Mission Olive Homes (R)
12 Washington Lennar (R)
13 Hirsch Property (R)
14 Sabercat Neighborhood Center (R/C)
15 Driscoll Road Town Homes (R)
16 Durham Market Place Property (C)
17 Lancar Townhomes at Warren (R)
18 Hackamore Planned District (R)
19 Laguna Commons (R)
20 Villas at Florio (R)
21 Convergence House (I)
22 Monument Corner (C)
23 Thermofisher Scientific (I)
24 Sisters of the Holy Family (R)
25 St. Joseph (R)
26 Stengner Development (C)
27 Central park Terraces (Central park South) (R)

Legend

Project Study Limits
R - Residential Development
C - Commercial Development
I - Industrial Development

Fremont Planned Developments

Figure 2.1-2b

Source: Circlepoint, 2014

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Alameda County Transportation Plan

The *Alameda County Transportation Plan* identifies express lane projects as a means to generate revenue for transportation improvements and reduce traffic congestion. One of the key steps for implementation of priority projects and programs is as follows:

> *Continue to develop policies to encourage revenue generation from HOV/express lane projects and policies regarding allocation of HOV/express lane funds.*[4]

Conservation Plans

Alameda County East County Area Plan

The portion of the project limits north of Fremont, including the Sunol area, is located outside the urban growth boundary in unincorporated Alameda County. This area falls within Alameda County's *East County Area Plan*. In 2000, Alameda County approved the Save Agriculture and Open Space Lands Initiative (Measure D), which amended the *East County Area Plan* to further protect areas outside the urban growth boundary from development through application of stringent development review and prohibitive growth policies.[5] The *East County Area Plan* includes policies that protect the farmland areas adjacent to the project limits.

East Alameda County Conservation Strategy

The portion of the project limits north of Fremont, including the Sunol area, is located within the planning area associated with *East Alameda County Conservation Strategy* (Conservation Strategy). The Conservation Strategy offers a framework and guidance for environmental permitting. The guidance includes an inventory of biological resources, and avoidance and minimization measures, mitigation standards, and conservation actions, which may be used to identify biological baseline information and develop mitigation measures.[6]

Habitat Conservation Plan/Natural Communities Conservation Plan

There is currently no approved Habitat Conservation Plan (HCP) or Natural Communities Conservation Plan in effect for the areas that surround the project limits.

The San Francisco Public Utilities Commission (SFPUC) is preparing a multi-species HCP for ongoing operation and maintenance of the SFPUC owned portion of the Alameda Watershed in and around the northern portion of the project limits. Final administrative draft HCP chapters were completed between January, 2010 and May, 2012. Portions of the HCP have been reviewed by federal and state agencies and revised accordingly, but the plan has not

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[4] Alameda County Transportation Commission. Alameda Countywide Transportation Plan. 2012. <http://www.alamedactc.org/app_pages/view/795> Accessed on April 1, 2013; 7-1.

[5] Alameda County Community Development Agency, *East County Area Plan*, 2000: i-vii.

[6] Alameda County, East Alameda County Conservation Strategy, 2010: Chapter 1, http://www.eastalco-conservation.org/documents.html

been formally adopted. The proposed HCP establishes a framework for complying with state and federal endangered species regulations and to mitigate for impacts of SFPUC ongoing operation and maintenance activities.[7]

General Plans

City of Milpitas General Plan

The project limits are located, in part, within the City of Milpitas. The Circulation Element of the City of Milpitas General Plan provides guiding principles for circulation within the city.

<u>Guiding Principle for Street Network and Classification Principles and Policies</u>

3. b-G-1. Develop a street network integrated with the pattern of living, working, and shopping areas, and which provides for safe, convenient, and efficient vehicular movement within the City and to other parts of the region.

<u>Guiding Principle for Goods Movement</u>

3. e-G-1. Provide adequate circulation and off-street parking and loading facilities for trucks.

City of Fremont General Plan

The project limits are located, in part, within the City of Fremont. The Mobility Element of the City of Fremont General Plan includes several goals and policies related to the Build Alternative.

Policy 3-3.4 calls for implementation of transportation systems management measures (TSM) to reduce peak hour traffic congestion and make the most efficient use of the city's transportation infrastructure.

> *Implementation 3-3.4.B: HOV/Express Lanes.* Support provision and expansion of HOV/express lanes on local interstates as a means of encouraging carpooling and increasing the number of passengers carried on freeways during the peak hour. The design of HOV/express lanes should allow ingress and egress for Fremont drivers as well as those passing through the city.

Policy 3-4.7 calls for investments in transportation infrastructure, including roads, BART, rail lines, bus-only lanes, bike lanes, and pedestrian bridges are sited and designed in a way that complements the natural and built environments.

> *Implementation 3-4.7.A: Transportation and Sensitive Natural Features.* Ensure that proposed transportation facilities are designed and constructed to avoid or minimize impacts on wetlands, steep slopes, and other environmentally sensitive areas.

[7] SFPUC webpage, http://sfwater.org/index.aspx?page=412, accessed September 20, 2013.

Implementation 3-4.7.B: Transportation and Historic Resources. Ensure that transportation improvements respect and conserve identified historic structures, sites, and landmark trees whenever feasible.

Implementation 3-4.7.C: Mitigating Operational Impacts. Ensure that transportation facilities are designed and constructed to mitigate operational impacts such as noise and vibration on adjacent land uses. Use quiet pavement design when repaving primary arterials to the extent feasible.

Policy 3-6.4 calls for support of measures that encourage through truck traffic to use interstate highways rather than local truck routes.

Policy 3-5.1 calls for participation regional transportation and land use planning efforts, including programs to balance jobs and housing, manage traffic congestion, address auto-related emissions and greenhouse gases, and reduce the share of the region's trips made by single occupant vehicles.

City of Pleasanton General Plan

The project limits do not extend through the City of Pleasanton; however, Pleasanton is located in close proximity to the land use study area. The Circulation Element of the City of Pleasanton General Plan includes the following goal related to the project.

Goal 2 Develop and manage a local and regional street and highway system which accommodates future growth while maintaining acceptable levels of service.

Environmental Consequences

Table 2.1.1-2 summarizes the consistency of the alternatives with the applicable state, regional, and local land use plans and programs adopted for the area. Plans, programs, and policies that are applicable to the Phase 1 segment are identified.

Table 2.1.1-2 Consistency with State, Regional, and Local Plans and Programs

Policy	Build Alternative	No-Build Alternative
Plan Bay Area / Change in Motion: Transportation 2035[a]		
Implement a regional express lane network and use a market-based pricing system to manage transportation demand and pay for system improvements	**Consistent.** The Build Alternative would construct an HOV/express lane, which would reduce traffic congestion and optimize roadway capacity. As a result, the northbound I-680 corridor would become part of the regional Bay Area Express Lane Network.	**Not Consistent.** Under the No-Build Alternative, no changes to the existing roadways would occur within the project limits. This alternative would not incorporate northbound I-680, within the project limits, into the regional express lane network.

Policy	Build Alternative	No-Build Alternative
Valley Transportation Plan 2030		
Seriously consider express lanes as a form of roadway pricing	**Consistent.** The Build Alternative would provide an express lane, which is a form of roadway pricing for single-occupancy vehicles.	**Consistent.** Under the No-Build Alternative, no changes to the existing roadways would occur within the project limits. Consideration of express lanes may continue.
Alameda County Transportation Plan[a]		
Continue to develop policies to encourage revenue generation from express lane projects and policies regarding allocation of express lane funds	**Consistent.** The Build Alternative would provide an express lane that would generate revenues to support transportation operations and maintenance.	**Not Consistent.** Under the No-Build Alternative, no changes to the existing roadways would occur and no express lane revenue would be generated within the project limits.
Alameda County East County Area Plan[a]		
Policy 71: The County shall conserve prime soils (Class I and Class II, as defined by the USDA Soil Conservation Service Land Capability Classification) and Farmland of Statewide Importance and Unique Farmland (as defined by the California Department of Conservation Farmland Mapping and Monitoring Program) outside the Urban Growth Boundary.	**Generally Consistent.** The Build Alternative would require acquisition of a relatively small amount of Unique Farmland. See discussion in **Section 2.1.4, Farmlands**. Although this action would not be fully consistent with Policy 71, the acquisition of the land would not impact agricultural production or impact prime soils.	**Consistent.** Under the No-Build Alternative, no acquisition of Unique Farmland would occur within the project limits.
Policy 85: The County shall utilize provisions of the Williamson Act and other appropriate economic incentives to support agricultural uses.	**Consistent.** The Build Alternative would not prohibit the County from supporting agricultural uses.	**Consistent.** The No-Build Alternative would not prohibit the County from supporting agricultural uses.
Policy 86: The County shall not approve cancellation of Williamson Act contracts within or outside the County Urban Growth Boundary except where findings can be made in accordance with state law, and the cancellation is consistent with the Initiative. In no case shall contracts outside the Urban Growth Boundary be canceled for purposes	**Consistent.** The Build Alternative would require acquisition of relatively small portions of land under a Williamson Act contract, which would cause cancelation of the contract on the portion of land acquired. However, this property acquisition would be for public facility use. See discussion in **Section 2.1.4, Farmlands**.	**Consistent.** Under the No-Build Alternative, no acquisition of property under Williamson Act contracts would occur within the project limits.

Policy	Build Alternative	No-Build Alternative
(Policy 86 cont.) *inconsistent with agricultural or public facility uses. Prior to canceling any contract inside the County Urban Growth Boundary, the Board of Supervisors shall specifically find that there is insufficient non-contract land available within the Boundary to satisfy state-mandated housing requirements. In making this finding, the County shall consider land that can be made available through reuse and rezoning of non-contract land.*		
Policy 87: The County shall encourage the establishment and permanent protection of existing and new cultivated agriculture through the use of home site clustering, agricultural easements, density bonuses, or other means.	**Consistent.** The Build Alternative would not construct any new buildings or units and would therefore not conflict with agricultural protection.	**Consistent.** The No-Build Alternative would not change existing conditions and would therefore not conflict with agricultural protection.
Policy 88: The County shall encourage the cities in East County to adopt policies and programs (such as mitigation fees for the conversion of agricultural lands within city boundaries and on lands to be annexed to a city) to fund the Alameda County Open Space Land Trust for protection of resources and the preservation of a continuous open space system outside the Urban Growth Boundary.	**Consistent.** The Build Alternative would not interfere with adoption of policies to fund open space protection.	**Consistent.** The No-Build Alternative would not interfere with adoption of policies to fund open space protection.

Policy	Build Alternative	No-Build Alternative
East Alameda County Conservation Strategy[a]		
The East Alameda County Conservation Strategy is intended to provide an effective framework to protect, enhance, and restore natural resources in eastern Alameda County, while improving and streamlining the environmental permitting process for impacts resulting from infrastructure and development projects.	**Consistent.** The Build Alternative would not conflict with the intent of the East Alameda County Conservation Strategy.	**Consistent.** Under the No-Build Alternative, no changes to existing conditions would occur within the project limits.
SFPUC Proposed HCP[a]		
The intent of the SFPUC proposed HCP is to avoid, minimize, and mitigate for adverse effects on threatened and endangered species resulting from SFPUC activities; accommodate current and future operations and maintenance activities in the Alameda watershed; and provide the basis for take authorization pursuant to ESA and CESA.	**Consistent.** The Build Alternative would not conflict with any policies set forth in the proposed HCP.	**Consistent.** Under the No-Build Alternative, no changes to existing conditions would occur within the project limits.
City of Milpitas General Plan		
3. b-G-1: Develop a street network integrated with the pattern of living, working and shopping areas, and which provides for safe, convenient, and efficient vehicular movement within the city and to other parts of the region	**Consistent.** The Build Alternative would increase the capacity on a regional interstate, which would increase the efficiency of regional travel.	**Not Consistent.** Under the No-Build Alternative, no changes to the existing roadways would occur within the project limits. This alternative would not increase efficient vehicular movement to other parts of the region.
3. e-G-1: Provide adequate circulation and off-street parking and loading facilities for trucks	**Consistent.** The Build Alternative would increase the capacity on a regional interstate, which would increase the capacity and efficiency of goods movement.	**Not Consistent.** Under the No-Build Alternative, no changes to the existing roadways would occur within the project limits. This alternative would not increase the capacity and efficiency of goods movement, and would not affect off-street parking and loading facilities for trucks.

Policy	Build Alternative	No-Build Alternative
City of Fremont General Plan[a]		
Implementation 3-3.4.B: Support provision and expansion of HOV/ express lanes on local interstates as a means of encouraging carpooling and increasing the number of passengers carried on freeways during the peak hour. The design of HOV/express lanes should allow ingress and egress for Fremont drivers as well as those passing through the city.	**Consistent.** The Build Alternative would provide an HOV/express lane in the northbound direction, within the project limits. The express lane would allow continuous access.	**Not Consistent.** Under the No-Build Alternative, no changes to the existing roadways would occur within the project limits. This alternative would not provide an express lane within the project limits.
Implementation 3-4.7.A: Ensure that proposed transportation facilities are designed and constructed to avoid or minimize potential impacts on wetlands, steep slopes, and other environmentally sensitive areas.	**Consistent.** Implementation of avoidance, minimization, and/or mitigations provided in **Section 2.3.1, Natural Communities,** and **Section 2.3.2, Wetlands and Other Waters,** would ensure avoidance or minimization of impacts to environmentally sensitive areas.	**Consistent.** Under the No-Build Alternative, no improvements to transportation facilities would be constructed within the project limits and there would be no impacts to environmentally sensitive areas.
Implementation 3-4.7.B: Ensure that transportation improvements respect and conserve identified historic structures, sites, and landmark trees whenever feasible	**Consistent.** No known historic structures, sites, and landmark trees have been identified within the project study limits.	**Consistent.** Under the No-Build Alternative, no improvements to existing conditions would occur within the project limits and no cultural resources or landmark trees would be impacted.
Implementation 3-4.7.C: Ensure that transportation facilities are designed and constructed to mitigate operational impacts such as noise and vibration on adjacent land uses. Use quiet pavement design when repaving primary arterials to the extent feasible	**Consistent.** Implementation of avoidance, minimization, and/or mitigation measures provided in **Section 2.2.7, Noise,** would minimize noise and vibration impacts.	**Consistent.** Under the No-Build Alternative, no changes to existing conditions would occur within the project limits and no new sources of noise and vibration would be introduced.

Policy	Build Alternative	No-Build Alternative
City of Pleasanton General Plan[a]		
Goal 2. Develop and manage a local and regional street and highway system which accommodates future growth while maintaining acceptable levels of service	**Consistent.** The Build Alternative is would accommodate future growth and improve levels of service on I-680, which is part of the regional highway system.	**Not Consistent.** Under the No-Build Alternative, no changes to existing roadways would occur within the project limits. This alternative would not accommodate future growth and would not improve levels of service in I-680.

Source: Caltrans, 2014b
Note: a= applicable to Phase 1 of the Build Alternative

The MTC completed the program-level Project Study Report (PSR) to support the Bay Area Express Lane Backbone Network in September, 2011. As part of that study, express lanes on the I-680 corridor were evaluated; the study concludes that implementation of express lanes along the corridor is feasible.

The Build Alternative is consistent with the express lanes project described in the MTC Plan Bay Area, and would be part of MTC's "backbone" network of express lanes in the San Francisco Bay Area, as described in MTC's Express Lane Backbone Network PSR.

Build Alternative

The Build Alternative is consistent with the plans, policies, and programs discussed above and outlined in **Table 2.1.1-2**.

Phase 1 - Initial Construction Phase

Phase 1 is consistent with the plans, policies, and programs discussed above and outlined in **Table 2.1.1-2**.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-680 within the project limits. The freeway travel lanes along the I-680 corridor would remain as they currently exist and no HOV/express lane in the northbound direction would be constructed. No bridge structures would be widened or replaced. The No-Build Alternative would not accommodate future growth envisioned by the plans, policies, and programs discussion about in **Table 2.1.1-2**. As such, the No-Build Alternative is not consistent with the applicable local or regional planning documents described above.

Avoidance, Minimization, and/or Mitigation Measures

The Build Alternative is consistent with local planning goals and policies to improve traffic circulation and improve safety on the local roadway network and at the existing interchanges; therefore, no avoidance, minimization, or mitigation measures are required.

2.1.2 PARKS AND RECREATIONAL FACILITIES

AFFECTED ENVIRONMENT

Information in this section is based on the CIA prepared for the project (Caltrans, 2014b). There are 26 parks and recreational facilities within 0.5 miles from the proposed Build Alternative improvements (see **Figure 2.1-3** and **Table 2.1.2-1**). The Jose Higuera Adobe Park, Sunol Valley Golf Club, Bay Area Ridge Trail, and Sabercat Creek Trail are the only parks and recreational facilities adjacent to the I-680 freeway corridor, within the project limits. The Jose Higuera Adobe Park and the Sunol Valley Golf Club are located approximately 150 feet to the south and north of the proposed Build Alternative improvements, respectively. The Bay Area Ridge Trail between Mission Peak and Vargas Plateau crosses under I-680 within the project limits at Vargas Road in Fremont. The Sabercat Creek trails are located east of I-680 between Washington Boulevard and Durham Road, approximately 250 feet east of the project limits.[8] There is a bike path "vision network" in Alameda County that would travel along Mission Road, parallel to the I-680 corridor.[9]

Table 2.1.2-1 Parks and Recreational Facilities

#	Name	Address
1	Thomas Russell Middle School Playfields	1331 East Calaveras Boulevard, Milpitas
2	Jose Higuera Adobe Park	N. Park Victoria Dr. & Wessex Pl. Milpitas
3	Milpitas Sports Center & Teen Center	1325 East Calaveras Boulevard, Milpitas
4	Cardoza Park	Park Victoria and Kennedy, Milpitas
5	Creighton Park	Olympic west of South Park Victoria, Milpitas
6	Augustine Memorial Park	Cortez and Coelho, Milpitas
7	Calle Oriente Mini-Park	Calle Oriente & N. Park Victoria Dr Milpitas
8	Murphy Park	Yellowstone Ave. & S. Park Victoria Dr. Milpitas
9	Sandalwood Park	Escuela Pkwy & Russell Ln. Milpitas
10	Selwyn Park	Selwyn Dr. & Dempsey Rd. Milpitas
11	Jones Memorial Park	Jacklin Rd. & N. Hillview Dr. Milpitas
12	Pecot Park	Dixon Rd. & Vegas Ave. Milpitas

[8] City of Fremont, Public Works, Sabercat Restoration, accessed from http://www.fremont.gov/index.aspx?NID=1211, October 8, 2013.

[9] The Alameda Countywide Bicycle Plan (2012) establishes countywide capital projects, programs and plans that are intended to implement the plan's vision and goals. The Plan includes a 762-mile "vision network" of countywide bicycle facilities that provide connections between communities, access to transit, and inter-jurisdictional trail networks. Of the total mileage, approximately 48 percent is yet to be constructed, including the Mission Road segment closest to the project limits.

#	Name	Address
13	Booster Park	Gable Dr. and Hoyt St., Fremont
14	Lone Tree Creek	500 Starlite Way, Fremont
15	Mission San Jose[1]	Mission Blvd. and St. Anthony Dr., Fremont
16	Plomosa Park	Wilaneta Ave. at Plomosa Rd., Fremont
17	Sabercat Trail[1]	Sabercat Creek, east of I-680 between Washington Blvd. and Durham Rd.
18	Sunol Valley Golf Course[1]	6900 Mission Road, Sunol,
19	Sunol Community Park[1]	Main St. at Kilkare, Sunol
20	Sinnott Park	Tahoe Dr. and Butano Dr., Milpitas
21	Foothill Park	Roswell Dr. at Edsel Dr., Milpitas
22	Peter T. Gill Park	Santa Rita Rd., Milpitas
23	Warm Springs Park	47300 Fernald St., Fremont
24	Bay Area Ridge Trail - Juan Bautista de Anza National Historic Trail	Mission Peak to Vargas Plateau at Vargas Road, Fremont
25	Arroyo Agua Caliente Park[1]	Gardenia Way, Fremont
26	Mission San Jose Bicentennial[1]	Mission Blvd. and Mission Tierra Pl., Fremont

Note:

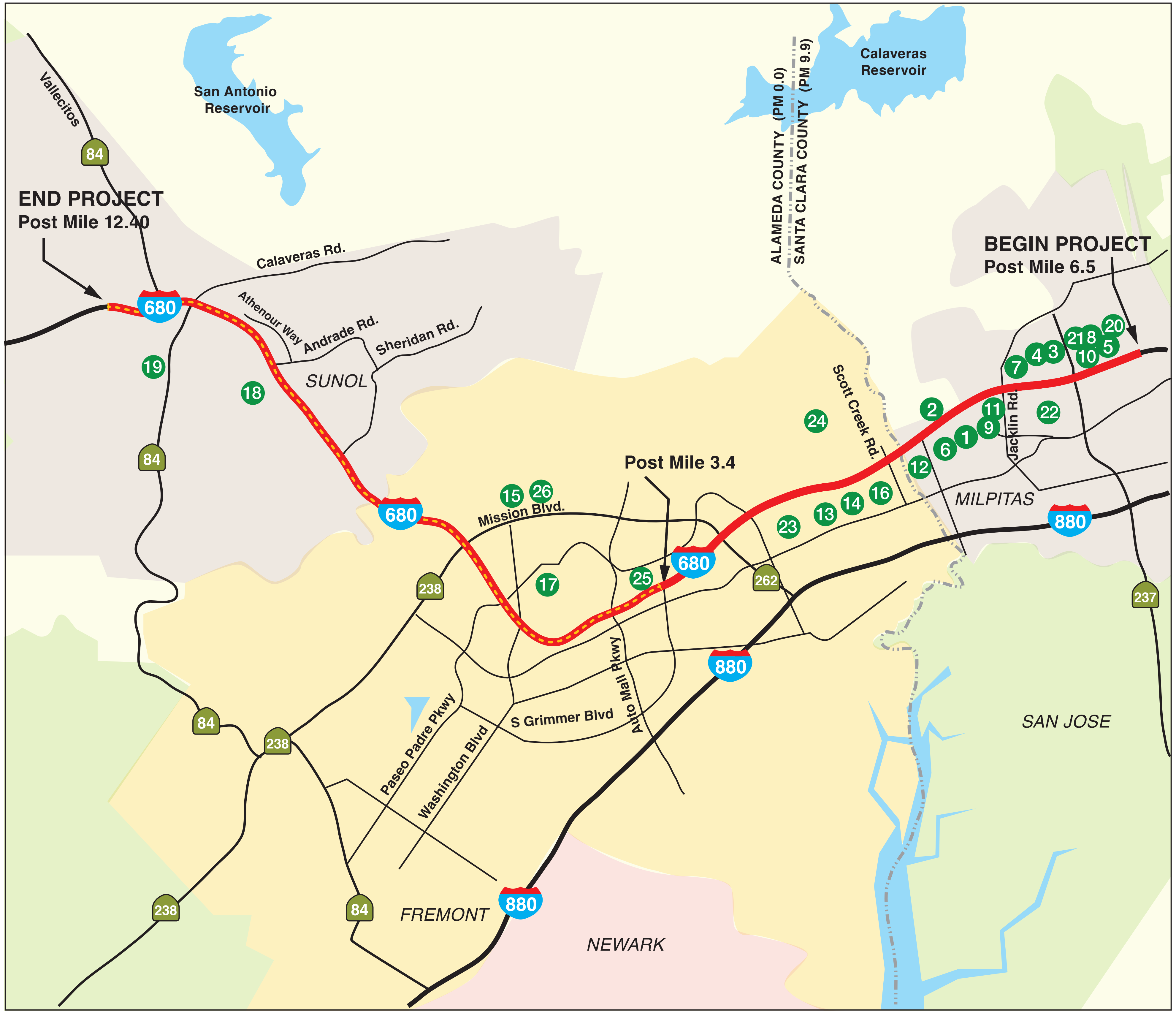
1. Within 0.5-mile of Phase 1 of the Build Alternative

Sources: City of Milpitas General Plan, 2010; City of Fremont General Plan, 2011, Google Maps

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Property of the nearby parks, recreational facilities, and ecological preserve identified in **Table 2.1.2-1** would not be acquired as part of the Build Alternative, thereby avoiding direct effects. The Bay Area Ridge Trail that crosses under I-680 at Vargas Road would remain open during construction and would not be impacted as part of the Build Alternative. Since the Build Alternative would not substantially alter the location of I-680, the distance between the parks and recreational facilities and the freeway corridor will not change when compared to existing conditions. The proposed Build Alternative improvements would be far enough away from these parks and recreational facilities that there would be no permanent effects. There is a bike path "vision network" in Alameda County that would travel along Mission Road, parallel to the I-680 corridor. The striped bike lanes proposed on Sheridan Road and Athenour Way under the Build Alternative are not part of the "vision network" alignment. Additionally, the proposed striped bike lanes would not preclude the construction of the future bike paths in this area.



1 Thomas Russell Middle School Playfields
2 Jose Higuera Adobe Park
3 Milpitas Sports Center & Teen Center
4 Cardoza Park
5 Creighton Park
6 Augustine Memorial Park
7 Calle Oriente Mini-Park
8 Murphy Park
9 Sandalwood Park
10 Selwyn Park
11 Jones Memorial Park
12 Pecot Park
13 Booster Park
14 Lone Tree Creek
15 Mission San Jose
16 Plomosa Park
17 Sabercat Trail
18 Sunol Valley Golf Course
19 Sunol Community Park
20 Sinnott Park
21 Foothill Park
22 Peter T. Gill Park
23 Warm Springs Park
24 Bay Area Ridge Trail - Juan Bautista de Anza National Historic Trail
25 Arroyo Agua Caliente Park
26 Mission San Jose Bicentennial Park

N

Parks and Recreational Facilities

Figure 2.1-3

Source: Circlepoint, 2014

Fig 2.1-3 back (11x17)

Since the Build Alternative would not substantially alter the location of I-680, the distance between the parks and recreational facilities and the freeway corridor will not change when compared to existing conditions. Increases in ambient noise levels for the areas immediately adjacent to I-680 are discussed in **Section 2.2.7, Noise**, which concludes that the Build Alternative would not result in noise impacts in the areas where the Jose Higuera Adobe Park, Sunol Valley Golf Club, Bay Area Ridge Trail, and Sabercat Creek Trail are located. Based on the results of the modeled noise levels in these areas, the predicted increase in traffic noise under the Build Alternative would be too small to be perceived by the human ear. Potential air quality impacts are discussed in **Section 2.2.6, Air Quality**, which concludes that diesel exhaust from construction equipment poses both a health and nuisance impact to nearby receptors. Implementation of construction period minimization measures will reduce any air quality impacts resulting from construction activities, thus no substantial long-term air quality effects would result from the Build Alternative.

Section 4(f) resources include publicly-owned parks, recreational areas, and wildlife refuges. Additionally, historic and archaeological sites on or eligible for the National Register of Historic Places, and which warrant preservation, are protected. These resources are further discussed in **Section 2.1.9, Cultural Resources** and **Appendix B**. Several of the parks listed in **Table 2.1.2-1** qualify for consideration under Section 4(f); however, the Build Alternative would not result in permanent, temporary, or constructive use of any park or recreation facilities requiring protection under Section 4(f). There are no wildlife refuges on or near the project corridor. Therefore, the proposed Build Alternative would have no impact on these resources.

Phase 1 – Initial Construction Phase

As with the Build Alternative, Phase 1 would not impact any park facilities requiring protection under Section 4(f). **Table 2.1.2-1** identifies the few parks that are within 0.5-mile of Phase 1 of the Build Alternative, and qualify for consideration under Section 4(f); however, the Build Alternative would not alter the qualities, features, or attributes of these parks. There are no wildlife refuges on or near the project corridor. Therefore, the proposed Build Alternative, including Phase 1, would have no impact on these resources.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not have any effect on parks and recreational facilities.

AVOIDANCE, MINIMIZATION, AND/ OR MITIGATION MEASURES

No avoidance, minimization, and/or mitigation measures are necessary because the Build Alternative would not impact parks and recreational facilities within the project limits.

2.1.3 GROWTH

REGULATORY SETTING

The Council on Environmental Quality (CEQ) regulations, which established the steps necessary to comply with the National Environmental Policy Act (NEPA) of 1969, requires evaluation of the potential environmental effects of all proposed federal activities and programs. This 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 CEQ regulations (40 Code of Federal Regulations [CFR] 1508.8) 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.

The California Environmental Quality Act (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…"

AFFECTED ENVIRONMENT

Information in this section is based on the CIA prepared for the project (Caltrans, 2014b). The study area for the growth impacts discussion is defined by the census tract blocks that encompass or are adjacent to the I-680 corridor, within the project limits. This study area extends beyond the physical boundaries of the proposed Build Alternative improvements to include a diverse mix of land uses and communities that may be affected by the project.

Population and Housing Trends in the Study Area

The study area for growth impacts has experienced stable development over the past several years. Population in the study area is projected to continue increasing, adding more residents over the next several decades. Accordingly, the number of new households is also expected to increase to accommodate such population trends. As previously discussed in **Section 2.1.1, Land Use**, there are a number of future land use development projects in close proximity to the I-680 corridor (see **Table 2.1.1-1**). **Table 2.1.3-1** summarizes existing and projected population and housing growth through 2040 for the cities of Milpitas, Fremont, and Pleasanton as well as the regional Bay Area.[10]

[10] Association of Bay Area Governments jurisdiction for the "Bay Area" includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

Table 2.1.3-1 2000-2040 Population and Household Growth

Geographic Area	Population			Households		
	2000	2010	2040	2000	2010	2040
Bay Area	6,783,762	7,150,739	9,299,100	2,466,020	2,608,023	3,308,090
City of Milpitas	62,698	66,790	109,100	17,132	19,184	31,680
City of Fremont	203,413	214,089	275,500	68,237	71,004	89,090
City of Pleasanton	63,654	70,285	91,800	23,311	25,245	32,300

Source: Association of Bay Area Governments, Projections 2013.
Note: The Association of Bay Area Governments does not itemize population/housing projections for the unincorporated community of Sunol specifically; therefore, such data is not included in this table.

To accompany the increased population described above, housing is also expected to grow rapidly within the incorporated cities of the study area. The unincorporated community of Sunol, located in the northern portion of the study area, is outside the urban growth boundary line for Alameda County. While the 2010 census indicated that 913 people reside in the community of Sunol within 362 households (**Section 2.1.5, Community Impacts**), the county preserves this area as long-term open space and does not encourage development. Therefore, growth within the community of Sunol is not anticipated to substantially increase over the next several decades.

According to the Association of Bay Area Governments (ABAG), the following gains are expected in total households by 2040, within the incorporated cities:

- City of Milpitas – 12,496 additional households
- City of Fremont – 18,086 additional households
- City of Pleasanton – 7,055 additional households

Employment Trends in the Study Area

Employment throughout the Bay Area region declined during the recent economic downturn. However, job growth is expected substantially grow over the next two decades, with a 33 percent increase in the region between 2010 and 2040. Consistent with the Bay Area trends, Fremont is expected to increase its jobs by 33 percent. Fremont is a major employment center with a variety of industries including technology, research and development, manufacturing, and more recently biotechnology, life sciences and "green" technologies. Employment (job) trends and projections for Milpitas, Fremont, and Pleasanton are shown in **Table 2.1.3-2**. As discussed above, the unincorporated community of Sunol is primarily designated open space and is not considered a center of industry prioritized for employment growth.

Table 2.1.3-2 2010-2040 Employment Growth

Geographic Area	Employment (Jobs)		
	2010	2040	Percent Change
Bay Area	3,385,300	4,505,230	33%
City of Milpitas	45,190	57,810	28%
City of Fremont	90,010	120,000	33%
City of Pleasanton	54,340	69,640	28%

Source: Association of Bay Area Governments, Projections 2013.
Note: The Association of Bay Area Governments does not itemize employment projections for the unincorporated community of Sunol specifically; therefore, such data is not included in this table.

ENVIRONMENTAL CONSEQUENCES

Caltrans' *Environmental Handbook Volume 4, Community Impact Assessment* states that "growth inducement is defined as the relationship between the proposed transportation project and growth within the project limits." Caltrans has developed guidance for determining if a project is considered to be growth-inducing, both directly and indirectly.[11] Based on a "First-cut screening," it was determined that indirect project-related growth is reasonably foreseeable, but not to the extent that it would impact resources of concern. The results of the first cut screening are documented below. No additional growth analysis is required.

Build Alternative

By the year 2040, the construction of the new HOV/express lane under the Build Alternative would accommodate a 12 percent increase in the number of vehicles that can be served by northbound I-680, within the project limits, during the peak evening commute hours (2:00 to 8:00 PM). The purpose of the Build Alternative is to relieve traffic congestion and improve traffic flow on the regional highway network and create a new source of revenue for transportation related projects. By implementing these improvements, the Build Alternative would accommodate growth on a regional level.

By improving access and highway capacity, the Build Alternative could indirectly result in the development and intensification of land uses in cities surrounding the project limits. There are several locations within the study area where housing and employment-generating land uses could be developed; however, these areas are already planned for and forecasted in land use regulating documents (i.e., City of Milpitas General Plan, City of Fremont General Plan, and City of Pleasanton General Plan). The surrounding areas are

[11] Caltrans, 2006. *Guidance for Preparers of Growth-related, Indirect Impact Analyses*. Available at: http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/GRI_guidance06May_files/gri_guidance.pdf; Last Accessed: February 24, 2014.

largely built out, and the majority of future development will generally involve redevelopment of existing areas or infill development of vacant lots within urbanized areas (see **Section 2.1.1, Land Use,** *Planned Development*).

The Build Alternative does not propose any changes to the zoning or land use designations along the freeway. While the Build Alternative would improve the flow of traffic access to and from I-680, no new on- or off-ramps to the local roadways would be constructed. Existing access points to the areas surrounding the project limits would remain the same. For these reasons, the Build Alternative would not affect the rate, amount, or type of growth envisioned by the regulating documents and future planned developments in the area. The Build Alternative would not induce growth beyond forecasted development in Santa Clara County or Alameda County, and would therefore not have a substantial effect on growth. Development outside of the urban growth boundary is protected in the East County Planning area by policies set forth in the East County Area Plan. Because the Build Alternative would not encourage growth beyond what is already planned for and forecasted, it would not add to the cumulative effects on resources of concern. Therefore, no further growth analysis is necessary.

Phase 1 – Initial Construction Phase

As with the full Build Alternative, Phase 1 would accommodate growth on a regional level by improving access and highway capacity. By the year 2040, the construction of the new HOV/express lane under Phase 1 of the Build Alternative would accommodate a 9 percent increase in the number of vehicles that can be served by northbound I-680, within the project limits, during the peak evening commute hours (2:00 to 8:00 PM). Phase 1 could indirectly contribute to the development and intensification of land uses in cities surrounding the project limits. However, reasonably foreseeable indirect growth that would be accommodated by Phase 1 is already planned for and forecasted in land use regulating documents (i.e., City of Milpitas General Plan, City of Fremont General Plan, and City of Pleasanton General Plan). Phase 1 would not change land use designations or provide new access to the areas surrounding the project limits, and would therefore not affect the rate, amount, or type of growth envisioned by the regulating documents. Phase 1 would not induce growth beyond forecasted development in Santa Clara County or Alameda County, and would therefore not have a substantial effect on growth. Because potential indirect growth resulting from Phase 1 is already planned for and forecasted, it would not add to the cumulative effects on resources of concern. Therefore, no further growth analysis is necessary.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not have any effect on growth.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

No avoidance, minimization, and/or mitigation measures are necessary because the Build Alternative would not induce growth beyond what has been planned for by the City of Milpitas, the City of Fremont, the City of Pleasanton, and Alameda County.

2.1.4 FARMLANDS

REGULATORY SETTING

The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (FPPA, 7 United States Code [USC] 4201-4209; and its regulations, 7 Code of Federal Regulations [CFR] Part 658) require federal agencies, such as the FHWA, to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

CEQA requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to discourage the early conversion of agricultural and open space lands to other uses. A review of farmland impacts, as they pertain to CEQA, is included in **Chapter 3.0, California Environmental Quality Act (CEQA) Evaluation** of this environmental document.

Alameda County East County Area Plan

The *East County Area Plan* is the comprehensive plan for the east county planning area in unincorporated Alameda County. In 2000, Alameda County approved the Save Agriculture and Open Space Lands Initiative (Measure D), amending the *East County Area Plan* to further protect areas outside the urban growth boundary from development through application of stringent development review and prohibitive growth policies.[12]

The *East County Area Plan* includes the following policies related to agricultural land conversion:

- *Policy 71:* The County shall conserve prime soils (Class I and Class II, as defined by the USDA Soil Conservation Service Land Capability Classification) and Farmland of Statewide Importance and Unique Farmland (as defined by the California Department of Conservation Farmland Mapping and Monitoring Program) outside the Urban Growth Boundary.

[12] Alameda County Community Development Agency, *East County Area Plan*, 2000: i-vii, 22, 24.

- *Policy 85:* The County shall utilize provisions of the Williamson Act and other appropriate economic incentives to support agricultural uses.
- *Policy 86:* The County shall not approve cancellation of Williamson Act contracts within or outside the County Urban Growth Boundary except where findings can be made in accordance with state law, and the cancellation is consistent with the initiative. In no case shall contracts outside the Urban Growth Boundary be canceled for purposes inconsistent with agricultural or public facility uses. Prior to canceling any contract inside the County Urban Growth Boundary, the Board of Supervisors shall specifically find that there is insufficient non-contract land available within the Boundary to satisfy state-mandated housing requirements. In making this finding, the County shall consider land that can be made available through reuse and rezoning of non-contract land.
- *Policy 87:* The County shall encourage the establishment and permanent protection of existing and new cultivated agriculture through the use of home site clustering, agricultural easements, density bonuses, or other means.
- *Policy 88:* The County shall encourage the cities in East County to adopt policies and programs (such as mitigation fees for the conversion of agricultural lands within city boundaries and on lands to be annexed to a city) to fund the Alameda County Open Space Land Trust for protection of resources and the preservation of a continuous open space system outside the Urban Growth Boundary.

AFFECTED ENVIRONMENT

Information in this section is based on the CIA prepared for the project (Caltrans, 2014b) and the *East County Area Plan*. The study area for the farmland impacts discussion is defined by the land use study area, which includes a 1-mile radius around the project limits.

The California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) keep track of changes in farmland use, including the conversion of farmland to urban use. This program is informational only, and does not regulate land uses.

The FMMP classifies farmland according to four types:

- Prime Farmland is considered land with the best physical and chemical features able to sustain long-term production of crops
- Farmland of Statewide Importance is land that is similar to Prime Farmland but has minor faults such as slopes or limited ability to store soil moisture

- Unique Farmland has lesser-quality soils, is used for the production of the state's leading crops, and may be irrigated or include non-irrigated orchards or vineyards (together, these three farmland classifications constitute "Important Farmland")
- Grazing Land contains existing vegetation suitable for livestock

The land use study area contains Important Farmland as designated by the California Department of Conservation and protected under Alameda County's *East County Area Plan*, Policy 71.

There is one FMMP designated Prime Farmland property within the study area, located in the southwest quadrant of the junction of I-680 and Paloma Way/Calaveras Road, in the community of Sunol. The Build Alternative does not propose improvements in this area.

There are two FMMP designated Unique Farmland areas within the study area. The first, located southwest of the I-680 and SR 238/Mission Boulevard junction in the City of Fremont is zoned for low-density residential use. The Build Alternative does not propose improvements in this area. The second designated Unique Farmland area is located in the southeast quadrant of the junction of I-680 and Paloma Way/Calaveras Road, in Sunol. The Build Alternative would include the partial acquisition of some of the property in this area, as further discussed under *Environmental Consequences* below. In addition to properties designated under FMMP, there are several properties under Williamson Act contracts in the northern part of the study area near Sunol, only one of which may be impacted by the Build Alternative. There are no Williamson Act properties within the study area in Milpitas or Fremont. **Figure 2.1-4** shows farmlands, including FMMP designations and Williamson Act properties, within the study area.

ENVIRONMENTAL CONSEQUENCES

The federal process for assessing farmland impacts is guided by the provisions of the Farmland Protection Policy Act, which calls for completion of the NRCS Form Conservation Program Application (CPA)-106 (see **Appendix K**). For purposes of NEPA analysis, the assessment rates the impact of a proposed project on the basis of a scoring system. Specific criteria related to agricultural viability are examined by both the NRCS and Caltrans, acting as the federal agency involved. Each criterion has a set number of points it may be awarded. If the Site Assessment points in Form CPA-106 total less than 60, Form CPA-106 does not need to be submitted to the NRCS. Instead, the completed Form CPA-106 should be placed in the project files and summarized in the NEPA document. The total Site Assessment points in Form CPA-106 were below 60. A draft of Form CPA-106 is included in **Appendix K**.

The Williamson Act includes a provision prohibiting a public agency from acquiring prime farmland covered under the Act; however, state highways are generally exempt from this provision.[13] The Williamson Act property that would be affected by the Build Alternative is not prime farmland. Government Code Section 51293(d) exempts acquisition of Williamson Act property for public utility improvements from the prohibition of public improvements if the land surface is returned to its previous condition and when agricultural use of the affected parcel is not "significantly impaired" by construction of the public utility.

Build Alternative

The Build Alternative would result in the conversion of a small amount of farmland protected by the *East County Area Plan* and the NRCS' Farmland Protection Policy Act. The Build Alternative would convert a total of 1.21 acres of Unique Farmland, consisting of 0.57-acre to be converted to state-owned right-of-way and 0.64-acres for a utility easement that would allow for an underground electrical and communication conduit run (**Table 2.1.4-1**).

Under NEPA, based on the results of the Farmland Conversion Impact Rating for Corridor Type Projects (Form CPA-106), the Build Alternative would not result in an adverse effect due to proposed conversion of unique farmland. Notification of the proposed acquisition of farmland was sent to the USDA on October 30, 2014 (**Appendix K**).

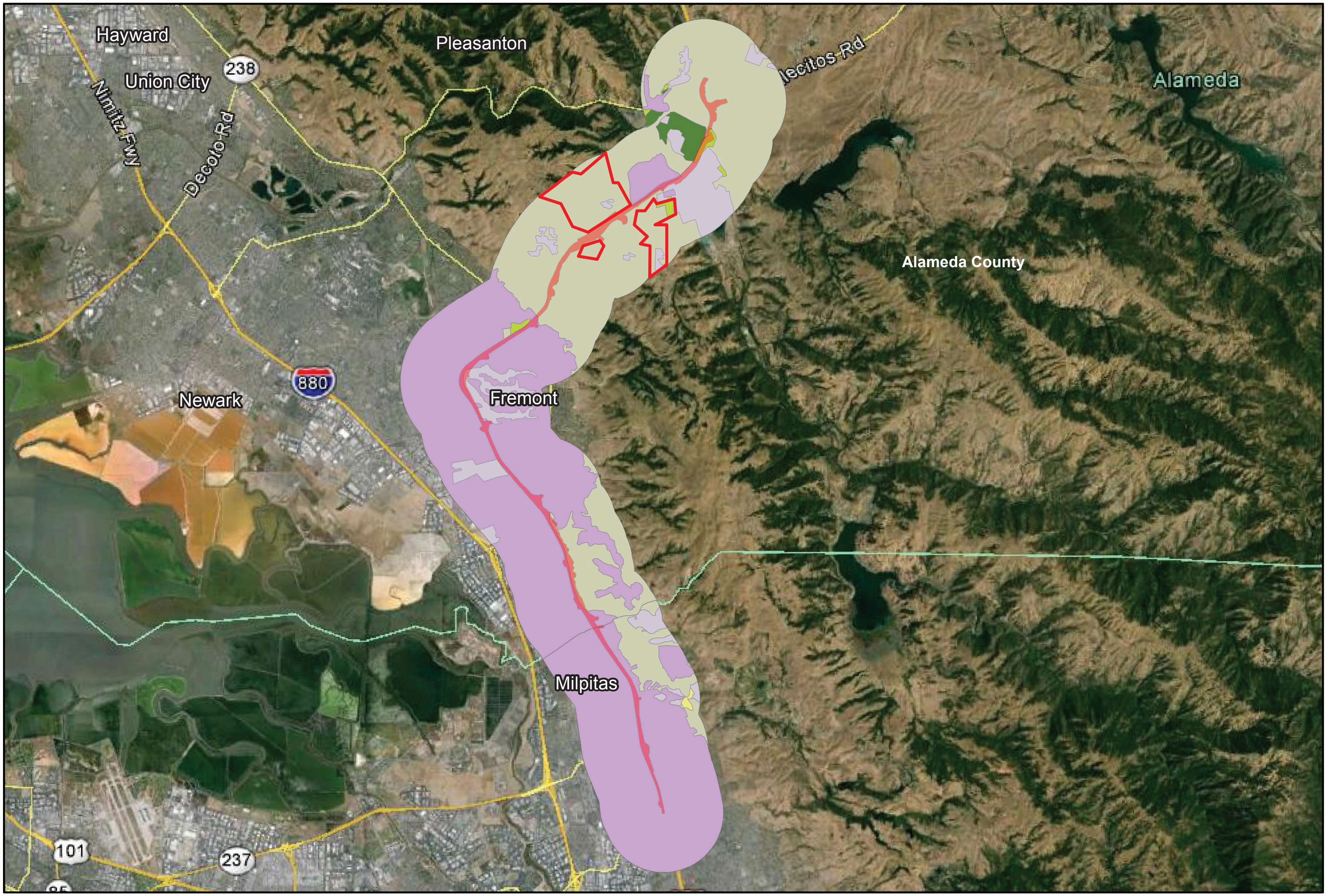
The Build Alternative would result in conversion of approximately 0.07-acre of land under a Williamson Act contract (**Table 2.1.4-2**). This portion of the property is designated as Non-Prime Agricultural Land on the Williamson Act map and is not designated as Farmland under the FMMP. Notification of the proposed conversion of land under Williamson Act contract was sent to the Department of Conservation on October 30, 2014.

Table 2.1.4-1 Farmland Property Acquisition

Assessor Parcel Number (APN)	Property Owner	ROW Acquisition		Utility Easement	
		Square feet	Acre	Square feet	Acre
096-0375-011-05	City & Co SF Water Dept.	24,780	0.57	0.00	0.00
096-0375-011-05	City & Co SF Water Dept.	0.00	0.00	27,825	0.64
	Total	**24,780**	**0.57**	**27,825**	**0.64**

Source: Caltrans, 2014b
Note: Co – County; SF – San Francisco

[13] Caltrans Standard Environmental Reference (SER) Guidelines, Chapter 4, 4-9, accessed from http://www.dot.ca.gov/ser/vol4/downloads/chap_appdx/Ch4_LandUse_21102011.pdf. Last accessed May 29, 2014.



Legend

- Project Area
- Urban Built up Land
- Grazing Land
- Farmland of Local Importance
- Unique Farmland
- Prime Farmland
- Farmland of Statewide Importance
- Other
- Williamson Act Properties

0 1 4 MILES

N

Farmlands within One Mile of Project Limits

Figure **2.1-4**

Source: Caltrans, 2014b

Acquisition of Williamson Act property for public utility improvements is permitted under Government Code Section 51293(d), under the conditions that the land surface is returned to its previous condition and when agricultural use of the affected parcel is not "significantly impaired" by construction of the public utility. Implementation of **Measure FRM-1** will ensure compliance with the Williamson Act.

Table 2.1.4-2 Williamson Act Property Acquisition

Assessor Parcel Number (APN)	Property Owner	ROW Acquisition		Utility Easement	
		Square feet	Acre	Square feet	Acre
096-0001-001-02	Sakkaris John P Tr.	1,565	0.04	-	-
096-0001-001-02	Sakkaris John P Tr.	-	-	1,125	0.03
	Total	**1,565**	**0.04**	**1,125**	**0.03**

Source: Caltrans, 2014b

Phase 1 – Initial Construction Phase

All of the affected FMMP designated farmland and Williamson Act properties are located in Phase 1. The environmental consequences identified above for the Build Alternative apply to Phase 1.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not have any effect on existing farmlands.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Measure FRM-1: Caltrans will comply with Government Code Section 51293(d), ensuring that the land surface disturbed for the relocation of utilities will be restored to its original conditions.

Phase 1 – Initial Construction Phase

Implementation of Phase 1 would result in the same farmland conversion as the Build Alternative, and would be required to comply with Government Code Section 51293(d) (**Measure FRM-1**).

2.1.5 COMMUNITY IMPACTS

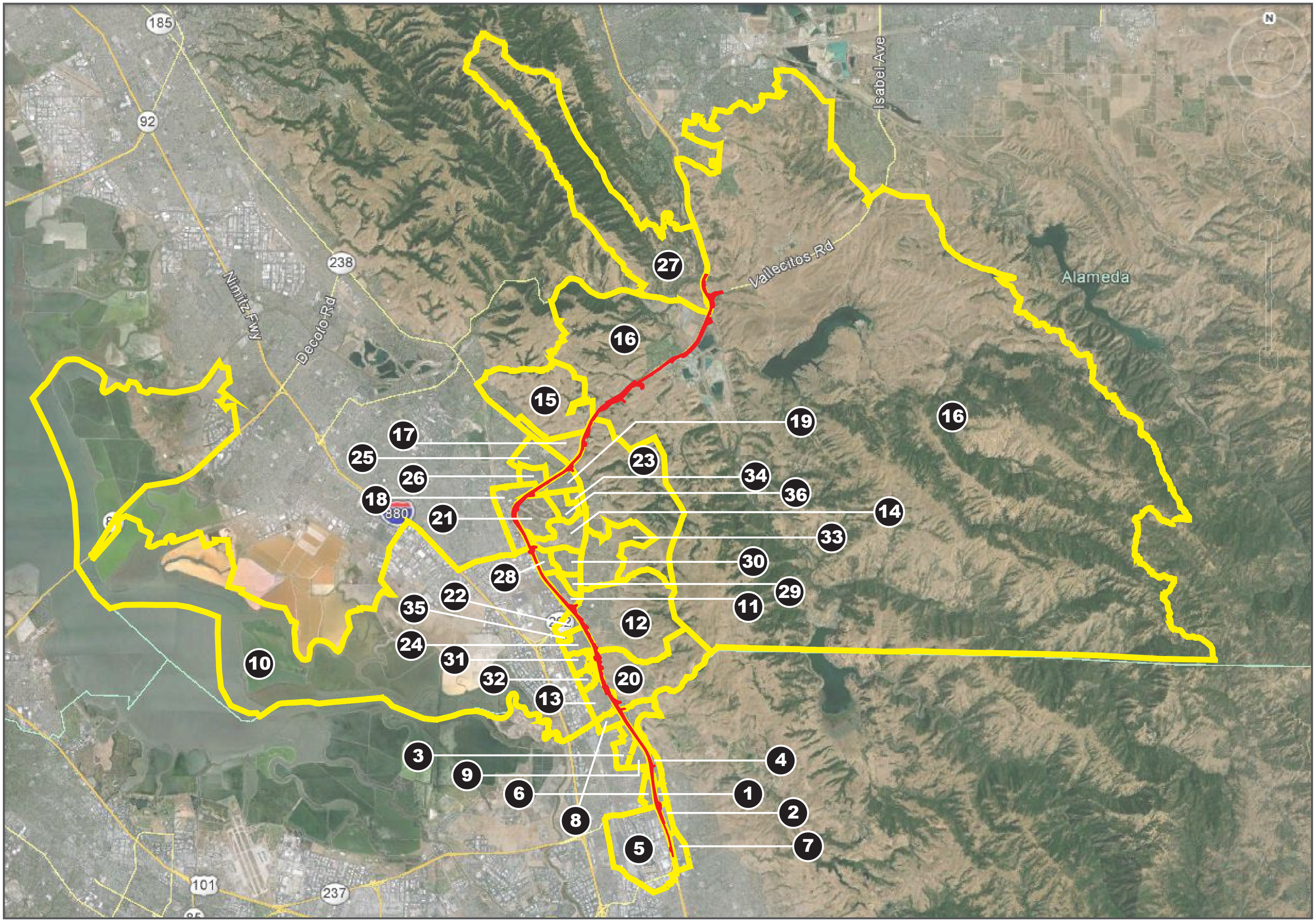
Information in this section is based on the CIA prepared for the project (Caltrans, 2014b). The study area for community impacts was defined by available statistical data describing Santa Clara County; Alameda County; the cities of Milpitas, Fremont, and Pleasanton; and thirty-six 2010 census tract block groups that encompass or are adjacent to the project limits. The entire study area for community impacts is within the City of Milpitas, the City of Fremont, unincorporated Alameda County, and small portions of the City of Pleasanton. **Figure 2.1-5** shows the boundary of each census tract block group that comprises the community impact study area, and **Table 2.1.5-1** lists the census tract block group numbers and corresponding identifiers shown on the map.

COMMUNITY CHARACTER AND COHESION

Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, established that the federal government use all practicable means to ensure that all Americans have safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). The FHWA in its implementation of NEPA (23 Code of Federal Regulations [CFR] 109[h]) directs that final decisions on projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

Under the California Environmental Quality Act (CEQA), an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects. A review of community impacts, as they pertain to CEQA, is included in **Chapter 3.0, California Environmental Quality Act (CEQA) Evaluation** of this environmental document.



Legend

Study Area Block Groups
Project Area

N
0 1 2
MILES

Community Impact Assessment Study Area Block Groups

Figure **2.1-5**

Source: Caltrans, 2014b

Table 2.1.5-1 Census Tracts and Block Groups

ID #	Santa Clara County	ID #	Alameda County
1	Census Tract 5044.12, Block Group 1	10	Census Tract 4415.03, Block Group 1
2	Census Tract 5044.18, Block Group 1	11	Census Tract 4431.02, Block Group 3
3	Census Tract 5044.21, Block Group 1	12	Census Tract 4432.00, Block Group 1
4	Census Tract 5044.20, Block Group 1	13	Census Tract 4433.01, Block Group 2
5	Census Tract 5045.04, Block Group 4	14	Census Tract 4431.05, Block Group 2
6	Census Tract 5044.14, Block Group 3	15	Census Tract 4420.00, Block Group 1
7	Census Tract 5044.16, Block Group 1	16	Census Tract 4507.01, Block Group 3
8	Census Tract 5044.22, Block Group 2	17	Census Tract 4420.00, Block Group 2
9	Census Tract 5044.21, Block Group 2	18	Census Tract 4422.00, Block Group 4
		19	Census Tract 4431.04, Block Group 3
		20	Census Tract 4432.00, Block Group 2
		21	Census Tract 4431.05, Block Group 1
		22	Census Tract 4433.21, Block Group 2
		23	Census Tract 4431.03, Block Group 1
		24	Census Tract 4433.22, Block Group 1
		25	Census Tract 4422.00, Block Group 2
		26	Census Tract 4422.00, Block Group 3
		27	Census Tract 4506.01, Block Group 1
		28	Census Tract 4431.02, Block Group 4
		29	Census Tract 4431.02, Block Group 2
		30	Census Tract 4431.02, Block Group 1
		31	Census Tract 4433.22, Block Group 2
		32	Census Tract 4433.01, Block Group 1
		33	Census Tract 4431.03, Block Group 2
		34	Census Tract 4431.04, Block Group 2
		35	Census Tract 4433.21, Block Group 1
		36	Census Tract 4431.04, Block Group 1

Source: Caltrans, 2014b
Note: Numbers (#) correspond with block group numbers on **Figure 2.1-5**.

Affected Environment

Demographic Profile

According to the 2010 United States (US) Census, the population of the community impact study area totals 67,507. Based on the 2010 U.S. Census, the racial categories are as follows: White, Black or African American, American Indian and Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, Some Other Race, and Two or More Races. With regard to a person's ethnicity, a person is either "Hispanic or Latino" or "Not Hispanic or Latino". A person that is Hispanic or Latino is a person of Cuban, Mexican, or any Spanish culture or origin, regardless of race.[14]

Table 2.1.5-2 shows the racial and ethnic composition of the community impact study area and associated jurisdictions. The population of Milpitas is composed of 85 percent minorities.[15] Santa Clara County, as a whole, has an ethnic minority population of 65 percent. The population of the City of Fremont and the community of Sunol are composed of 73 percent and 21 percent minorities, respectively; Alameda County as a whole has an ethnic minority population of 66 percent. The population in the study area is composed of 76 percent minorities. According to interviews with city stakeholders, communities are becoming more economically and racially diverse as an overall general trend.

Table 2.1.5-3 shows the median household income, poverty levels, and per capita income for the CIA study area in comparison with the surrounding cities, counties, and region. According to the 2000 Census,[16] median household incomes in the study area ($105, 995) were well above the Bay Area regional average ($62,024), and slightly above the City of Milpitas average ($84,429) and the City of Pleasanton average ($90,859), as most homes have dual incomes. The percentage of population below poverty level in the combined study area is lower than in the respective cities and counties.

However, Census Tract 4415.03, Block Group 1 in Fremont has a population below poverty of 22 percent, which is more than 10 percent above Fremont's overall average. Per capita income in the surrounding cities and counties are relatively similar to those of the greater Bay Area with the exception of Pleasanton, which has a per capita income of $41,623, and Sunol at $45,773. The study area per capita income and median household income are slightly higher than regional city trends.

[14] U.S. Census. 2012. About Hispanic Origin. Accessed from http://www.census.gov/population/hispanic/about/. Last accessed May 29, 2014.

[15] According to Executive Order 12898, the term "minority" includes any individual who is American Indian or Alaskan Native, Asian or Pacific Islander (including Native Hawaiian), Black/African American (not of Hispanic Origin), or Hispanic/Latino.

[16] Data for income and poverty on smaller geographic levels, such as census tracts and block groups, was not available at the time this document was being prepared. As such, the 2000 U.S. Census data is the best

Table 2.1.5-2 Minority Population, 2010

Population	Santa Clara County	City of Milpitas	Alameda County	City of Fremont	Comm-unity of Sunol	City of Pleasanton	Study Area
Total Population	1,781,642	66,790	1,510,271	214,089	913	70,285	67,507
Hispanic or Latino (of any race)	479,210 (27%)	11,240 (17%)	339,889 (23%)	31,698 (15%)	91 (10%)	7,264 (10%)	5,089 (8%)
Not Hispanic or Latino	1,302,432 (73%)	55,550 (83%)	1,170,382 (77%)	182,391 (85%)	822 (90%)	63,021 (90%)	62,418 (92%)
White	626,909 (35%)	9,751 (15%)	514,559 (34%)	56,766 (27%)	719 (79%)	42,738 (61%)	14,184 (21%)
Black or African American	42,331 (2%)	1,836 (3%)	184,126 (12%)	6,743 (3%)	1 (<1%)	1,116 (2%)	1,099 (2%)
American Indian and Alaska Native	4,042 (<1%)	137 (<1%)	4,189 (<1%)	458 (<1%)	3 (<1%)	143 (<1%)	88 (<1%)
Asian	565,466 (32%)	41,308 (62%)	390,524 (26%)	107,679 (50%)	48 (5%)	16,209 (23%)	44,697 (66%)
Native Hawaiian and Other Pacific Islander	6,252 (<1%)	316 (<1%)	11,931 (<1%)	1,064 (<1%)	5 (<1%)	125 (<1%)	150 (<1%)
Some Other Race	3,877 (<1%)	93 (<1%)	4,191 (<1%)	388 (<1%)	1 (<1%)	153 (<1%)	83 (<1%)
Two or More Races	53,555 (3%)	2,109 (3%)	60,862 (4%)	9,293 (4%)	45 (5%)	2,537 (4%)	2,117 (3%)

Note: Percentages (%) listed reflect the proportion of each race type relative to the total population.
Source: Caltrans, 2014b

Table 2.1.5-3 Household Income and Population Below Poverty Level (%), 2000

Geographic Area	Median Household Income	Percent Population Below Poverty Level	Per Capita Income
Study Area	$105,995	4.0%	$38,000
Santa Clara County	$74,335	7.5%	$32,795
City of Milpitas	$84,429	5.0%	$27,823
Alameda County	$55,946	11.0%	$26,680
City of Fremont	$76,579	5.4%	$31,411
Sunol	$88,353	1.4%	$45,773
City of Pleasanton	$90,859	2.6%	$41,623
Bay Area	$62,024	8.6%	$30,934

Source: Caltrans, 2014b

Over half of employment found within the study area is in the management and professional industries. Approximately 22 to 23 percent of the workforce in these cities is in the sales and office industries. The smallest employment sector for these cities is in the farming, fishing, forestry, and construction-related type of jobs at nearly 5 percent. The leading employers in Pleasanton, Milpitas, and Fremont represent the technology and science sectors.

The community impact study area is comprised of a mixture of land uses and open space. The southern portion of the corridor, from SR 237 in Milpitas to the Alameda County line, is surrounded by residential, commercial, office, and public facility uses. Through the City of Fremont, the corridor is surrounded by a mix of commercial, industrial, institutional, residential, parks and open space uses. In the northeastern Fremont hills and north through the community of Sunol in unincorporated Alameda County, land uses are predominantly large parcel agriculture and water management open space outside the urban growth boundary. Refer to **Section 2.1.1, Land Use,** for a discussion on the existing land use patterns surrounding the project limits.

Interviews with city stakeholders in Pleasanton, Fremont, and Milpitas, indicate that community members highly value the available parks and recreational resources in the study area. Most of the parks and recreational areas within Fremont include park amenities such as picnic sites, recreational fields (softball, soccer, tennis, etc.), and playgrounds. According to these interviews, community members, as a whole, are very active and utilize such resources. Additionally, public school systems in these cities are considered to be high-quality and a major selling point for residents to move to and/or continue to reside in these cities. Residents in Pleasanton, Fremont, and Milpitas are closely-knit, particularly in older parts of the city. The cities offer community events such as farmer's markets, outdoor movie screenings, street fairs, and other city-sponsored events. Additionally, sporting events and activities through the city's schools are popular and instill a sense of comradery between community members. All of these components and community values combined enhance the quality of life for residents and contribute to the community cohesiveness.

There are no schools located immediately adjacent to the project limits. A total of 26 community parks and recreational facilities are located within 0.5 mile from the project limits, including the Jose Higuera Adobe Park, Sunol Valley Golf Club, Bay Area Ridge Trail, and Sabercat Creek Trail.

Environmental Consequences

Build Alternative

Impacts to neighborhoods arising from transportation projects are generally related to the division of existing neighborhoods. According to Caltrans' *Environmental Handbook Volume 4 – Community Impact Assessment*, transportation projects may divide neighborhoods when they act as physical barriers, or when they are perceived as psychological barriers by neighborhood residents. In addition, transportation projects perceived as physical or perceptual barriers may isolate a portion of a neighborhood.

Transportation projects may also increase cohesion within neighborhoods by diverting vehicular traffic to other roadways and increasing the desirability of pedestrian activity through a neighborhood.

Pleasanton, Fremont, and Milpitas are well-established communities along the project corridor and contain mainly closely-knit, older neighborhoods. Many community and city-sponsored events occur regularly in these communities throughout the year and instill a sense of comradery and civic spirit. All of these components and community values combined enhance the quality of life for residents and contribute to the community cohesiveness. The Build Alternative's proposed roadway improvements are either on, or immediately adjacent to the existing highway; therefore no new physical or perceptual barriers would be created, nor would access be changed that would disrupt such community events or values. No division of existing neighborhoods or disruption of routines would result from implementation of the Build Alternative. Additionally, existing public facilities that are available to the community are located beyond the project limits and would not be directly affected by the Build Alternative. Accordingly, the Build Alternative would not negatively affect community cohesion or community cohesion within adjacent communities.

Phase 1 – Initial Construction Phase

As in the Build Alternative, Phase 1 would not negatively affect community cohesion as all proposed roadway improvements are either on, or immediately adjacent to, existing highways; therefore no new physical or perceptual barriers would be created nor would access be changed.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not have any effect on community cohesion.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are necessary because the project alternatives would have no effect on community cohesion.

RELOCATION AND REAL PROPERTY ACQUISITION

Regulatory Setting

Caltrans' Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of the RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. Please see **Appendix D** for a summary of the RAP.

All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 United States Code [USC] 2000d, et seq.). Please see **Appendix C** for a copy of the Caltrans' Title VI Policy Statement.

Affected Environment

The majority of the proposed improvements would be constructed within the existing right-of-way. However, in order to accommodate the additional HOV/express lane, the Build Alternative would involve the acquisition of portions (or slivers)[17] of 13 parcels within the project limits including 10 fee acquisitions (1.85 acres), 11 temporary construction easements (1.63 acres), and 4 utility easements (1.99 acres). Proposed property acquisitions and easements are listed in **Table 2.1.5-4**. All of the property acquisitions are located in the northern portion of the project limits, in unincorporated Alameda County.

Environmental Consequences

Build Alternative

Based on preliminary design, implementation of the Build Alternative would affect private and public properties listed in **Table 2.1.5-4,** as previously summarized under the *Affected Environment* discussion above. The land required for the Build Alternative primarily consists of slivers of property frontage and landscaped areas around on- and off-ramps. Permanent property acquisitions include portions of large rural agricultural properties, rural residential home sites, vacant residential, government owned vacant property, and commercial property. Utility easements entail installation or connection to underground infrastructure. Once the utility infrastructure is installed or connected to, the land would return to its original use. Generally, utility easements do not permanently change the intended use of the land. However, the land may need to be disturbed for maintenance and management purposes at a later time. Temporary construction easements directly surrounding the utility easements are needed to accommodate construction equipment and vehicles needed to construct the proposed utility infrastructure. Upon completion of construction, the land would be returned to the property owner and no long-term impact to the property would occur as a result.

None of the proposed property acquisitions, construction easements, or utility easements are in areas where there are existing structures or improvements. The remaining portions of these parcels will remain in private ownership. Proposed construction work would be limited to within or immediately adjacent to I-680 corridor. Therefore, construction would not disrupt existing designated land uses and would remain at a distance from the downtown areas, community centers, and parks and recreational areas where community members usually congregate for festivals, farmer's markets, and community events. As such, no displacement of any residence or business would be required. Residents and businesses whose access may be temporarily affected will be notified in advance of construction activity.

[17] A sliver acquisition is a partial acquisition of a parcel or strip of land.

Table 2.1.5-4 Proposed Right-of-Way Acquisitions

Number	Assessor Parcel Number (APN)	Property Owner	ROW Acquisition		Temporary Construction Easement		Utility Easement	
			Square feet	Acre	Square feet	Acre	Square feet	Acre
1	513-0701-014-04	Northstar Properties, LLC.	-	-	1,306	0.03	-	-
2	513-0065-011-02	Alarab Malik A. Tr & Barbara E. Tr	6,865	0.16	-	-	-	-
3	513-0065-011-02	Alarab Malik A. Tr & Barbara E. Tr	-	-	5,080	0.12	-	-
4	513-0065-015-05	Yosten Jimmie L.			1,390	0.03		-
5	096-0001-001-02	Sakkaris John P. Tr	1,565	0.04	-	-	-	-
6	096-0001-001-02	Sakkaris John P. Tr	-	-	1,125	0.03		
7	096-0001-001-02	Sakkaris John P. Tr	-	-	-	-	1,125	0.03
8	096-0001-003-12	Mariah II LLC	885	0.02	-	-	-	-
9	096-0001-003-12	Mariah II LLC	-	--	6,125	0.14	-	-
10	096-0001-003-12	Mariah II LLC	-	-	-	-	890	0.02
11	096-0001-003-09	Lin Andrew T. & Esther Trs	1,375	0.03	-	-	-	-
12	096-0001-003-09	Lin Andrew T. & Esther Trs	-	-	1,370	0.03	-	-
13	-	Tom R. Byrne	11,525	0.26	-	-	-	-
14	-	Tom R. Byrne	-	-	11,525	0.26	-	-
15	096-0001-006-04	Amant Antonette J. Tr	6,285	0.14	-	-	-	-
16	096-0001-008-07	Mission Valley Rock Co.	19,925	0.46	-	-	-	-
17	096-0001-008-07	Mission Valley Rock Co.	-	-	8,820	0.20	-	-
18	096-0001-010-05	Mission Valley Rock Co.	5,665	0.13	-	-	-	-
19	096-0001-010-05	Mission Valley Rock Co.	-	-	3,825	0.09	-	-
20	096-0375-011-05	City & Co. SF Water Dept.	24,780	0.57	-	-	-	-

Number	Assessor Parcel Number (APN)	Property Owner	ROW Acquisition		Temporary Construction Easement		Utility Easement	
			Square feet	Acre	Square feet	Acre	Square feet	Acre
21	096-0375-011-05	City & Co. SF Water Dept.	-	-	24,780	0.57	-	-
22	096-0375-011-05	City & Co. SF Water Dept.	-	-	-	-	27,825	0.64
23	096-0335-002-09	Gbadebo Michael A.	1,900	0.04	-	-	-	-
24	096-0335-002-09	Gbadebo Michael A.			5,535	0.13	-	-
25	-	State	-	-	-	-	56,628	1.30
		TOTAL	**80,770**	**1.85**	**70,881**	**1.63**	**86,468**	**1.99**

Source: Caltrans, 2014b
Note: LLC – Limited Liability Company; Co – County; SF – San Francisco

Phase 1 – Initial Construction Phase

All of the proposed property acquisitions are located in Phase 1; therefore, the affected properties would be the same as in the Build Alternative.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not have any effect on relocation and real property acquisition.

Avoidance, Minimization, and/ or Mitigation Measures

Build Alternative

Measure CMN-1: Caltrans will continue to implement a comprehensive community outreach program including ongoing outreach and coordination with affected property owners to minimize the impacts of access disruption or alterations as part of both project design and during construction.

During the final design phase of the project, a detailed Traffic Management Plan (TMP) would be developed to maintain property access during construction. The objective of the TMP would be to minimize the effects that construction activities would have on the traveling public. At a minimum, the TMP should include a public awareness campaign, including outreach and coordination with affected property owners to minimize the impacts of access disruption or alterations as part of both project design and during construction. Caltrans will notify affected businesses, residences, police, and emergency services at least one week in advance of any lane or roadway closures or impacts related to access. The TMP and construction documents will specify timeframes for roadway and lane closures. See **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, **Measure TRA-1** for a more detailed description of the TMP that would be required.

Phase 1 – Initial Construction Phase

All of the proposed property acquisitions are located in Phase 1; therefore, avoidance and minimization measures would be the same as in the Build Alternative.

ENVIRONMENTAL JUSTICE

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (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 2010, this was $23,492 for a family of four. In 2000, the poverty threshold was $17,603 for a family of four.[18]

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The 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 C** of this document.

Affected Environment

Per EO 12898, a population, as evaluated by U.S. census block groups, is subject to environmental justice analysis if it meets at least one of the following criteria:

- a low-income population that is greater than 25 percent of the total population of the community, or a minority population that is greater than 50 percent of the total population of the community
- a low-income and/or minority population that is more than 10 percentage points higher than the City or County average

Demographic Data: Minority Populations

Table 2.1.5-5 summarizes the racial and ethnic composition of the block groups located within the study area and the associated cities and counties. Based on the 2010 U.S. Census data, the population of Milpitas is composed of 85 percent minorities; Santa Clara County as a whole has an ethnic minority population of 65 percent. The population of the City of Fremont and the community of Sunol are composed of 73 percent and 21 percent minorities, respectively; and Alameda County as a whole has an ethnic minority population of

[18] U.S. Department of Health & Human Services, 2011 HHS Poverty Guidelines, <http://aspe.hhs.gov/poverty/11poverty.shtml>, Accessed August 23, 2013.

66 percent. This data indicates that there is a high minority population in cities and counties of the study area. Given that the minority population in the cities of Milpitas and Fremont are well over 50 percent, the entire cities would meet the criteria of an environmental justice community. The population in the study area is composed of 79 percent minorities.

Table 2.1.5-5 Race and Ethnic Minority Composition

Population	Santa Clara County	City of Milpitas	Alameda County	City of Fremont	Comm-unity of Sunol	City of Pleasanton	Study Area
Total Population	1,781,642	66,790	1,510,271	214,089	913	70,285	67,507
Hispanic or Latino (of any race)	479,210 (27%)	11,240 (17%)	339,889 (23%)	31,698 (15%)	91 (10%	7,264 (10%)	5,089 (8%)
Not Hispanic or Latino	1,302,432 (73%)	55,550 (83%)	1,170,382 (77%)	182,391 (85%)	822 (90%)	63,021 (90%)	62,418 (92%)
White	626,909 (35%)	9,751 (15%)	514,559 (34%)	56,766 (27%)	719 (79%)	42,738 (61%)	14,184 (21%)
Black or African American	42,331 (2%)	1,836 (3%)	184,126 (12%)	6,743 (3%)	1 (<1%)	1,116 (2%)	1,099 (2%)
American Indian and Alaska Native	4,042 (<1%)	137 (<1%)	4,189 (<1%)	45 (<1%)8	3 (<1%)	143 (<1%)	88 (<1%)
Asian	565,466 (32%)	41,308 (62%)	390,524 (26%)	107,679 (50%)	48 (5%)	16,209 (23%)	44,697 (66%)
Native Hawaiian and Other Pacific Islander	6,252 (<1%)	316 (<1%)	11,931 (<1%)	1,064 (<1%)	5 (<1%)	125 (<1%)	150 (<1%)
Some Other Race	3,877 (<1%)	93 (<1%)	4,191 (<1%)	388 (<1%)	1 (<1%)	153 (<1%)	83 (<1%)
Two or More Races	53,555 (3%)	2,109 (3%)	60,862 (4%)	9,293 (4%)	45 (5%)	2,537 (4%)	2,117 (3%)

Source: Caltrans, 2014b

As previously discussed, an environmental justice community under the minority population threshold would either be greater than 50 percent of the community population, or be more than 10 percentage points higher than the city average.

Approximately 34 of the 36 block groups in the study area have minority populations greater than 50 percent. The study area contains six block groups in which the minority population exceeds the city averages by more than 10 percent. There is one block group in Milpitas and five block groups in Fremont that constitute as an environmental justice community based on race. No block groups in the Sunol area constitute as environmental justice communities based on race.

As a whole, the 94 percent of the I-680 corridor within the project limits meets the criteria as an environmental justice community given the minority population is greater than 50 percent.

Socioeconomic Data: Low-Income Populations

Table 2.1.5-6 presents percentage of the population at or below the poverty level for the block groups located within the study area and the associated cities and counties, according to the 2000 Census.[19] As shown, the percentage of population below poverty level in the study area combined is lower than in the respective cities and counties.

As previously discussed, an environmental justice community under the low-income population threshold would either be greater than 25 percent of the total population of the community, or be more than 10 percentage points higher than the city average.

None of the census tracts in the study area have greater than 25 percent populations in poverty. However, Census Tract 4415.03, Block Group 1 in Fremont has a population below poverty of 22 percent, which is more than 10 percent above Fremont's average. This block group constitutes as environmental justice population based on income and race.

Table 2.1.5-6 Household Income and Population Below Poverty Level (%), 2000

Geographic Area	Median Household Income	Percent Population Below Poverty Level
Study Area	$105,995	4.0%
Santa Clara County	$74,335	7.5%
City of Milpitas	$84,429	5.0%
Alameda County	$55,946	11.0%
City of Fremont	$76,579	5.4%
Sunol	$88,353	1.4%
City of Pleasanton	$90,859	2.6%
Bay Area	$62,024	8.6%

Sources: Caltrans, 2014b

[19] Income and poverty level data is not available at the block group level for the 2010 Census; therefore, 2000 Census data is used for this analysis.

Environmental Consequences

Build Alternative

As previously discussed, approximately 94 percent of the study area meets the criteria of an environmental justice community given the minority population is greater than 50 percent.

The effects of the Build Alternative would be borne across a wide range of communities including both environmental justice and non-environmental justice communities. The Build Alternative would occur within an area with a high minority population and some low income populations, portions of which qualify as environmental justice communities. As such, the project's physical effects, including increases in noise levels and temporary construction-period emissions, would be borne by these communities.

As the project's purpose is to relieve traffic congestion and improve traffic flow on I-680 within the project limits, the Build Alternative would directly benefit these same communities. These same effects of the Build Alternative, both negative and beneficial, would also occur in non-environmental justice communities along the corridor. Given this situation, the environmental effects of the project that would be borne by the minority population within the study area would not be more severe or greater in magnitude than the adverse effects that would be suffered by non-minority populations.

The Build Alternative would not result in disproportionate impacts to environmental justice communities, and would not cause the displacement of any minority or low-income residences, businesses, or employees. There would be no disruption or effect on the existing land uses or community features in the surrounding areas. The Build Alternative would reduce traffic congestion resulting in overall improvement and reduction in air pollutants compared to the No-Build Alternative, also resulting in a benefit for adjacent land uses. None of the proposed right-of-way acquisitions would occur in block groups identified as environmental justice communities.

There are 6 block groups in the study area within which the minority population exceeds the city averages by more than 10 percent. These 6 environmental justice block groups in the community impact study area are listed in **Table 2.1.5-7**. Because these block groups have substantially higher minority populations than the surrounding city, additional review of the project's effects on these communities was conducted as part of this analysis. The review found that, like the rest of the study area, there are no project effects that would be more severe or greater in magnitude in these 6 block groups when compared to the rest of the adjacent communities.

Table 2.1.5-7 Environmental Justice Census Tract Block Groups – Build Alternative

#	Environmental Justice Block Groups	Environmental Justice Qualification	Land Use Impact
10	Block Group 1, Census Tract 4415.03, Alameda County	Race and Income	None
17	Block Group 2, Census Tract 4420, Alameda County	Race	None
33	Block Group 2, Census Tract 4431.03, Alameda County	Race	None
14	Block Group 2, Census Tract 4431.05, Alameda County	Race	None
22	Block Group 2, Census Tract 4433.21, Alameda County	Race	None
2	Block Group 1, Census Tract 5044.18, Santa Clara County	Race	None

Source: Caltrans, 2014b
Note: Numbers (#) correspond with block group numbers on **Figure 2.1-5**.

Phase 1 – Initial Construction Phase

There are two census tract block groups in the Phase 1 segment of the study area that qualify as environmental justice populations based on race. The environmental justice block groups within Phase 1 are listed in **Table 2.1.5-8**.

Table 2.1.5-8 Environmental Justice Census Tract Block Groups – Phase 1

#	Environmental Justice Block Groups	Environmental Justice Qualification	Land Use Impact
14	Block Group 2, Census Tract 4431.05, Alameda County	Race	None
17	Block Group 2, Census Tract 4420, Alameda County	Race	None

Source: Caltrans, 2014b
Note: Numbers (#) correspond with block group numbers on **Figure 2.1-5**.

As with the Build Alternative, Phase 1 would not result in the displacement of any minority or low-income residences, businesses, or employees; and there would be no disruption or effect on the existing land uses or community features in the surrounding areas. The Build Alternative would reduce traffic congestion resulting in overall improvement and reduction in air pollutants compared to the No-Build Alternative, also resulting in a benefit for adjacent land uses.

None of the proposed right-of-way acquisitions are located in block groups identified as environmental justice communities.

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to I-680, within the project limits; therefore, there would be no direct effect on minority populations. However, worsening traffic congestion in the study area could hinder access to housing, businesses, community facilities, and the provision of emergency services for minority residents, as well as the overall community.

Avoidance, Minimization, and/ or Mitigation Measures

Based on the above discussion and analysis, the Build Alternative will not cause disproportionately high and adverse effects on any minority or low-income populations as per E.O. 12898, regarding environmental justice. No avoidance, minimization, and/or mitigation measures would be required.

2.1.6 UTILITY/EMERGENCY SERVICES

AFFECTED ENVIRONMENT

Information in this section is based on the Draft Project Report (Caltrans, 2014c) and the CIA (Caltrans, 2014b) prepared for this project. Pacific Gas & Electric (PG&E) provides gas and electricity both regionally and to communities surrounding where project improvements would be constructed. AT&T provides communications services. The SFPUC, the Alameda County Water District (ACWD), the San Francisco Water District (SFWD), and the Santa Clara Valley Water District (SCVWD) provide local and regional water service. Wastewater collection, treatment, and disposal are provided by the Union Sanitary District (USD) and the San Jose/Santa Clara Water Pollution Control Plan (WPCP). Solid waste disposal and recycling services are provided by Allied Waste Services.

Police protection and traffic enforcement services within the project limits are provided by the Milpitas Fire Department, Milpitas Police Department, Fremont Fire Department, Fremont Police Department, and Alameda County Fire Department. The California Highway Patrol (CHP) has jurisdiction over the I-680 corridor for matters involving both traffic violations and emergency services. The three closest CHP offices to the project limits are located in San Jose and Fremont. The San Jose Area CHP office is located at 2020 Junction Avenue. The CHP Nimitz Inspection Facility is located at 4416 I-880, in Fremont. The CHP Mission Grade Inspection Facility is located on northbound I-680, just north of Sheridan Road, in Fremont.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Public Utilities

The Build Alternative would include the installation of an Electronic Tolling System (ETS) to operate, maintain and manage the new northbound I-680 HOV/express lane. The ETS is a combination of electronic toll collection devices (FasTrak® transponder readers and License Plate Recognition (LPR) cameras), video surveillance, and detection of traffic in the express and mixed flow lanes. The HOV/express lane would also include electronic Variable Toll Message Signs (VTMS) to provide graphic messages that inform motorists of pricing by toll zone, and operating rules. The final location of the electronic components of the Build Alternative would be determined during the final design phase of the project and in coordination with the tolling systems manager.[20]

To provide electrical power and communications to the electronic tolling equipment and signage for the express lane facility, electrical and communications conduits and fiber would be extended from existing sources along the outside edge of pavement. 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.

Relocation and adjustments to existing gas and electric transmission lines and street lighting are proposed as part of the Build Alternative. Utilities that would be affected include gas, and electrical lines. An approximately 200-foot portion of a 24-inch gas transmission line that crosses I-680 in a 30-inch casing between Vargas Road and Sheridan Road would need to be relocated outside of the right-of-way. A portion of a PG&E 115/60 kilovolt overhead electrical transmission lines supported on parallel steel lattice towers aligned along the east side of I-680, between Andrade Road and Calaveras Road (approximately Post Mile (PM) 10.7 to PM 10.88), would be relocated to accommodate widening of northbound I-680 and avoid encroachment of the towers and electrical transmission lines into state right-of-way.

The relocation of public utilities may result in minor interruption of service. To minimize this potential, Caltrans would enter into cooperative agreements with the affected utility owners. The precise field location of high-risk utilities would be positively identified during the final design phase in accordance with Caltrans Procedures on High Risk Utilities. Preliminary coordination with utility owners has been completed. The direct, physical effects related to the relocation of utilities are captured in **Section 2.2, Physical Environment**, as part of the evaluation of temporary construction activities of the Build Alternative.

[20]Each electronic tolling system would be linked to a Toll Data Center (TDC) that collects and records toll data. The TDC would be owned and operated by the Sunol Smart Carpool Lane Joint Powers Authority (SSCLJPA). The TDC then transfers toll data to the existing Regional Customer Service Center (RCSC) operated by the Bay Area Toll Authority (BATA), which would handle payment processing.

Emergency Services

Short-term operational effects to police, fire, and emergency service providers may result from construction-related activities under the Build Alternative. Increased emergency response times within the project limits could be caused by traffic congestion during construction and temporary lane closures. Lane closures are expected to be of short duration and would occur in off-peak commute hours; the effect is expected to be minimal.

The proposed improvements under the Build Alternative would ultimately reduce traffic congestion and indirectly improve access and response times for emergency services utilizing the northbound I-680 corridor within the project limits.

Phase 1 – Initial Construction Phase

The effects to utilities and emergency services described above for the Build Alternative are also applicable to the Phase 1 segment. There are no proposed improvements or conditions specific to the Phase 1 segment that would change the conclusions of the environmental consequences previously identified.

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to I-680 within the project limits, thereby avoiding the need to relocate utilities. Traffic congestion is expected to increase under the No-Build Alternative, which could in turn cause decreased access for emergency services.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure UTL-1: Detailed utility coordination and verification will be required during the final design phase of the project. The locations of the utilities will not be determined until final design, in coordination with the affected utility owner.

As described in the **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, **Measure TRA-1**, a Traffic Management Plan (TMP) that specifies all timeframes for all lane closures would be prepared. Emergency response services such as fire and police would also be notified one to two weeks in advance of any lane or roadway closures and any proposed detours. Implementation of the TMP would reduce short-term operational effects to police, fire, and emergency service providers that may result from construction-related activities under the Build Alternative.

Phase 1 – Initial Construction Phase

Coordination with the affected public utility service providers and the preparation of a TMP would occur as part of the final design phase for the Build Alternative alignment, including Phase 1. No additional avoidance, minimization, or mitigation measures would be required for Phase 1.

2.1.7 TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES

REGULATORY SETTING

Caltrans, as assigned by the FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations [CFR] 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 United States Code [USC] 794). FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to Federal-aid projects, including Transportation Enhancement Activities.

AFFECTED ENVIRONMENT

Information in this section is based on the Traffic Operations Analysis Study Report that was prepared for the project (Caltrans, 2014n).

The traffic study area was developed in consultation with the Alameda CTC and the cities of Fremont, Milpitas, and Pleasanton; and is intended to capture the local and regional traffic effects of the Build Alternative. The traffic study area encompasses the northbound I-680 corridor from just south of SR 237 to the Alcosta Boulevard interchange, in the City of San Ramon. A map of the traffic study area is shown on **Figure 2.1-6.**

The project is proposing capacity improvements only to the northbound direction of travel along I-680. The project corridor is heavily used for commute travel between residential areas in eastern Alameda and Contra Costa counties and employment areas in Santa Clara County. As a result of this travel pattern, the I-680 corridor experiences high levels of travel demand in the southbound direction during the morning commute period, and in the northbound direction during the afternoon/evening commute period. The southbound direction of the I-680 corridor was improved in the recent past with the addition of an HOV/express lane. The Build Alternative proposes a similar set of improvements to the northbound direction. Therefore, the traffic analyses presented in this EIR/EA focuses on the PM peak period (from 2:00 PM to 8:00 PM), because that is the time period during which the northbound corridor experiences the heaviest traffic demand. A PM peak period analysis encompasses the broadest range of potential project impacts, and thus an evaluation of the morning (AM) peak period was not necessary.[21]

The concern of traffic impacts on northbound I-680 north of the project limits toward I-580, as well as increases in traffic congestion on local streets through Pleasanton, was raised by the City of Pleasanton during the scoping process for the project. The evaluation of these impacts and effects on the local circulation system within Pleasanton is summarized in **Chapter 4.0, Comments and Coordination**, for informational purposes only. This "Tri-Valley Triangle" area, generally bounded by I-680, I-580, and SR 84, is represented as the "extended study area" in **Figure 2.1-6**.

Current and Forecast Traffic Analysis

Data collection was undertaken during fall 2011 and spring 2012 to determine existing peak period travel times (2:00 to 8:00 PM), mainline queuing characteristics, traffic volumes, vehicle occupancies, and truck percentages within the traffic study area boundaries.[22] Additionally, mainline and ramp lane configurations were collected along the study segments of northbound I-680.

Traffic forecasts were based on applications of the Alameda CTC Travel Demand Forecasting Model and developed in more detail for the traffic study area using the VISUM software. Freeway operations were analyzed using the VISSIM micro-simulation software so that the complex interaction of the freeway mainline and ramps under congested conditions could be measured.[23] The evening peak period operational models were calibrated and validated to the established criteria for traffic volumes, travel times, and observed queues.

The traffic operations analysis evaluates three distinct timeframes:

- existing (2011)
- construction year (2020)
- design year (2040)

Level of Service

Level of Service (LOS) is a measure of actual traffic conditions and the perception of such conditions by motorists. There are six LOS ratings, ranging from LOS A (free traffic flow with low traffic volumes and high speeds, resulting in low vehicle densities) to LOS F (traffic volumes exceeding the capacity of the infrastructure, resulting in forced flow traffic operations, slow speeds, and high vehicle densities). This traffic analysis evaluates traffic

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[21] The Traffic Operations Analysis Report (Caltrans 2014n), includes the existing AM peak period traffic counts that justify the elimination of the AM peak period analysis.
[22] The freeway "mainline" refers to the general mixed-flow travel lanes.
[23] A traffic assignment model was developed specifically for the study area using the VISUM software, which allowed for the travel demand forecasting model input into the VISSIM micro-simulation model.

operations based on the LOS criteria for highway and weaving segments, highway ramp junctions, local intersections, and peak commute hour vehicle speeds. The criteria used in this traffic analysis are consistent with the procedures contained in the Highway Capacity Manual (see **Figure 2.1-7**).

It is often useful to supplement the individual segment analyses with system-wide performance measures such as vehicle miles of travel, average travel time, average travel speed, and vehicle hours of delay to obtain a better understanding of overall traffic operations. This information can be particularly useful when comparing project alternatives. Several Measures of Effectiveness (MOEs) computed with the VISSIM model was used to quantify traffic operations of the northbound I-680 corridor:

- Volume Served – a measure of the vehicles that can be served by the I-680 corridor during the analysis period. For those locations that are over-capacity for a given time period, the volume served will be less than the demand volume.

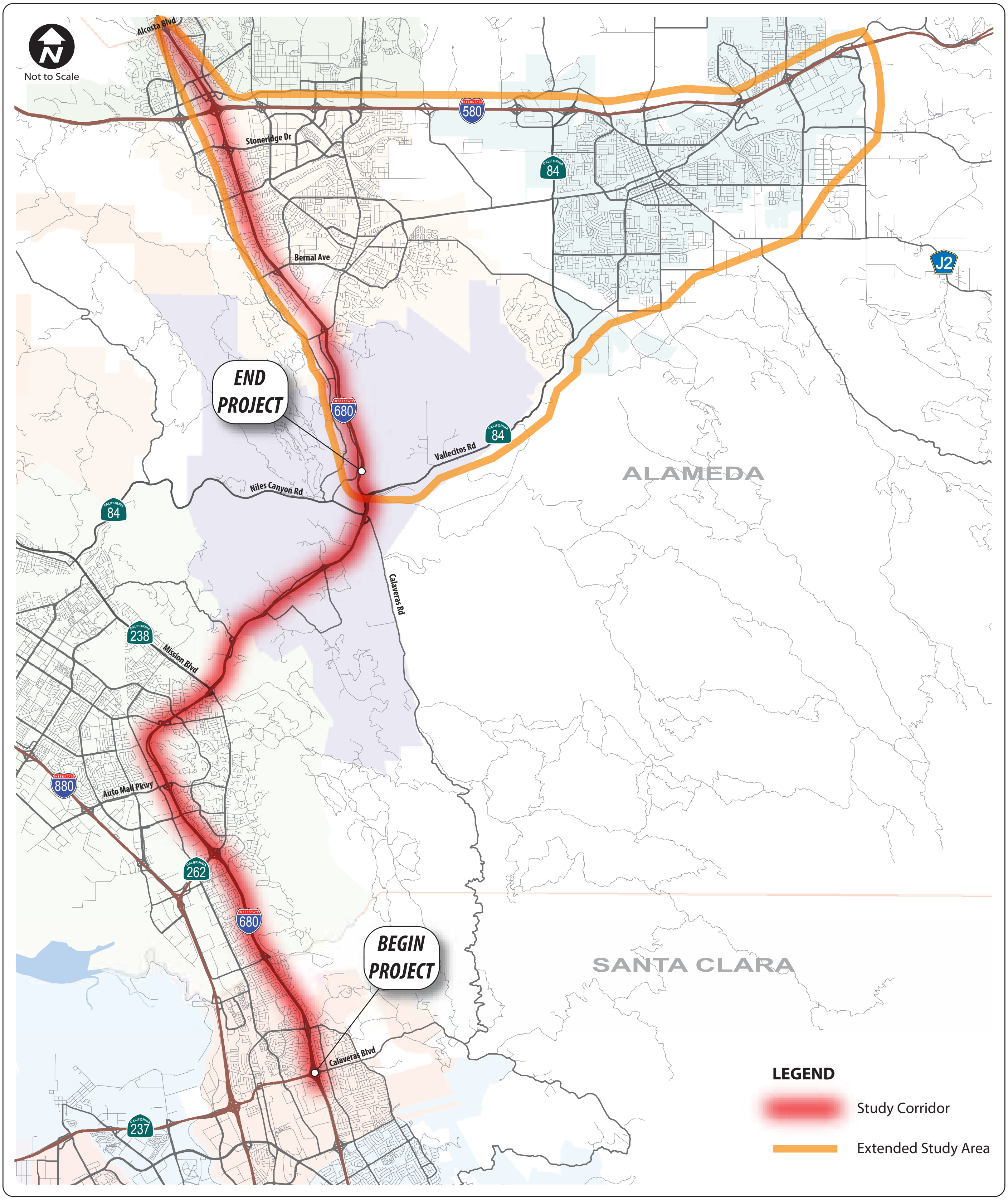
- Vehicle Miles Traveled (VMT) and Person Miles of Travel (PMT) – measures the total vehicle and person throughput of the corridor. These measures take into consideration the actual volume served versus the demand and the trip lengths of those vehicles and travelers. Total Travel Time – a measure of the time taken by all vehicles (on average) to travel through the network during the peak period. The travel time calculation considers the average delay throughout the corridor, vehicle queues, and friction caused by merging vehicles.

- Average Travel Speed – the average speed of vehicles in the network. This measure depends both on the posted speed for a given link and the level of traffic congestion.

- Vehicle Hours of Delay (VHD) and Person Hours of Delay (PHD) – the total delay incurred by vehicles and persons, respectively, during the peak period due to traffic congestion.

Existing Traffic Operations

Traffic congestion along northbound I-680, within the traffic study area, has continued to be considerable for over a decade now, even during the recent economic downturn. During a typical weekday afternoon peak period, the freeway is congested at several locations where the demand exceeds available capacity. Traffic congestion begins to develop around 3:30 PM when a bottleneck forms between the Washington Boulevard on-ramp and the SR 238 (Mission Boulevard) off-ramp. The queue from this bottleneck gradually increases until it reaches a point between the Scott Creek Road and SR 262 (Mission Boulevard) interchanges, with a queue length of approximately 4.5 miles. The queue remains at this location until 6:30 PM then dissipates and is generally cleared by 7:30 PM. A second bottleneck also develops just after 4:15 PM between the Andrade Road on-ramp and the SR 84 (Vallecitos Road) off-ramp.

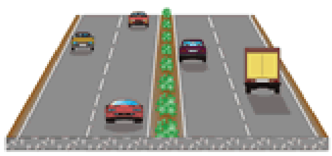
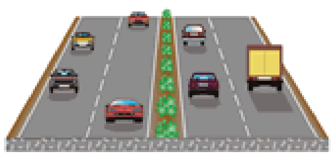
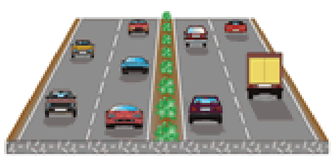
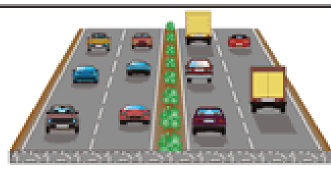
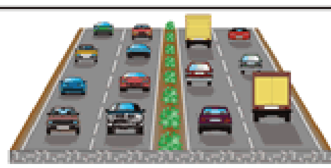
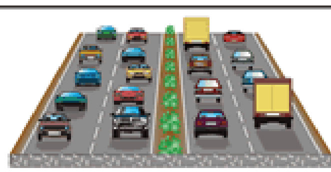


Traffic Study Area

Figure **2.1-6**

Source: Caltrans, 2014n

LEVELS OF SERVICE
for Freeways

Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptions
A		70	Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. **No delays**
B		70	Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. **No delays**
C		67	Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. **Minimal delays**
D		62	Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. **Minimal delays**
E		53	Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. **Significant delays**
F		<53	Very congested traffic with traffic jams, especially in areas where vehicles have to merge. **Considerable delays**

Levels of Service for Freeways

Figure 2.1-7

Source: Caltrans Style Guide, 2014.

The queue from this bottleneck gradually increases until it reaches the SR 238 (Mission Boulevard) interchange, with a queue length of approximately 3.5 miles. This queue remains at this location until 7:15 PM then dissipates and is generally cleared by 8:00 PM.

Evening Peak Hour Performance

Tables 2.1.7-1 and **2.1.7-2** summarize mainline and ramp operations along I-680 within the traffic study area, respectively. Existing system-wide MOEs for the six-hour PM peak period (2:00 to 8:00 PM) are presented in **Table 2.1.7-3**. System-wide MOEs are presented for the entire peak period to provide a more comprehensive understanding of overall traffic operations during this period. During the evening peak commute hour (5:00 to 6:00 PM), LOS F conditions occur between SR 262 and Washington Boulevard and between Sheridan Road and SR 84 (Calaveras Road). The total delay when compared to free flow conditions for a single vehicle passing through the traffic study area during the evening peak hour is estimated to be 15 to 20 minutes. Cumulatively, all of the vehicles during the six-hour evening peak commute period experience a total of approximately 6620 vehicle-hours of delay with an average travel speed of 46 miles per hour (mph). The average travel speed during the evening peak commute hour varies from 69 mph between SR 237 and Scott Creek Road to 12 mph near Sheridan Road. Average travel speed drops substantially between SR 262 and Washington Boulevard (less than 15 mph on the general purpose freeway travel lanes).

Traffic Diversion

There is a sharp increase in traffic using the Sheridan Road off-ramp and a very similar spike in traffic using the Andrade Road on-ramp between 5:00 and 7:00 PM, with almost exactly the same number of vehicles added to both ramps as compared to the volumes before 5:00 and after 7:00 PM. This indicates that a substantial number of drivers (approximately 600 vehicles in the peak commute hour alone) are choosing to divert off of northbound I-680 and use local roads through this 1.6 mile stretch of the corridor. In addition, at a public information meeting in August 2013 in the City of Fremont, local officials reported substantial increases in traffic congestion on Mission Boulevard (and parallel city streets) between the SR 262 and SR 238 interchanges during the PM peak period. Based upon public input, it appears some drivers are also choosing to use Calaveras Road between the SR 237 and SR 84 interchanges. All of this information suggests that the traffic congestion on the freeway is substantial enough to cause high levels of traffic diversion at multiple locations.

Table 2.1.7-1 Current and Forecasted PM Peak Hour Level of Service for Freeway Mainline

Segment	Existing (2011)	Construction Year (2020)			Design Year (2040)[A]		
		No-Build	Phase 1 (Build Alternative)[B]		No-Build	Phase 1 (Build Alternative)[B]	
			Mixed Flow	Express Lane		Mixed Flow	Express Lane
SR 237 to Jacklin Rd.	D	**F**	E (D)	N/A (A)	**F**	**F (F)**	N/A (A)
Jacklin Rd. to Scott Creek Rd	D	**F**	D (C)	N/A (A)	**F**	**F (F)**	N/A (C)
Scott Creek Rd. to SR 262	E	**F**	E (D)	N/A (A)	**F**	**F (F)**	N/A (B)
SR 262 to Auto Mall Pkwy.	**F**	**F**	C (C)	N/A (A)	**F**	**F (F)**	N/A (C)
Auto Mall Pkwy. to Washington Blvd.	**F**	**F**	C (C)	A (A)	**F**	**F (F)**	B (C)
Washington Blvd. to SR 238	E	E	C (C)	B (B)	E	**F (F)**	E (D)
SR 238 to Vargas Rd.	D	D	D (D)	C (C)	D	**F (F)**	E (C)
Vargas Rd. to Sheridan Rd.	D	D	C (C)	B (B)	**F**	**F (F)**	E (D)
Sheridan Rd. to Andrade Rd.	**F**	**F**	C (C)	B (B)	**F**	**F (F)**	C (C)
Andrade Rd. to SR 84 (West)	**F**	D	**F (F)**	C (C)	D	**F (F)**	E (D)
SR 84 (West) to SR 84 (East)	C	C	C (C)	C (C)	C	E (E)	E (D)
SR 84 (East) to Koopman Rd.	D	C	**F (F)**	N/A	C	**F (F)**	N/A

Table Note: **Bold** font indicates LOS F conditions.

A. The conditions reported represent the single evening peak commute hour (worst-case). Because of the very heavy forecasted traffic volumes, congested conditions would extend for multiple hours.

B. The Build Alternative may be constructed under a single construction contract or in multiple phases . The first phase of the Build Alternative (Phase 1) would include the construction of a new HOV/express lane facility on northbound I-680 from just Auto Mall Parkway to SR 84 (Vallecitos Road), in Alameda County, with an auxiliary lane between the Washington Boulevard on-ramp and Mission Boulevard (SR 238) off-ramp. Phase 1 also includes the construction of an approach lane from South Grimmer Boulevard to the start of the new HOV/express lane at Auto Mall Parkway. The "Phase 1" scenario represents the traffic conditions that would occur if only Phase 1 were constructed. The "Build Alternative" scenario represents the full build out of the Build Alternative (i.e., Phase 1 and future phases).

Source: Caltrans, 2014n

Table 2.1.7-2 Current and Forecasted PM Peak Hour Level of Service for Ramps

Segment	Existing (2011)	Construction Year (2020)			Design Year (2040)[A]		
		No-Build	Phase 1 (Build Alternative)[B]		No-Build	Phase 1 (Build Alternative)[B]	
			Mixed Flow	Express Lane		Mixed Flow	Express Lane
SR 237 to Jacklin Rd.	D	**F**	D	C	**F**	**F**	**F**
Jacklin Rd. to Scott Creek Rd	D	**F**	D	C	**F**	**F**	**F**
Scott Creek Rd. to SR 262	D	**F**	D	C	**F**	**F**	**F**
SR 262 to Auto Mall Pkwy.	C	**F**	C	C	**F**	**F**	**F**
Auto Mall Pkwy. to Washington Blvd.	**F**	**F**	C	B	**F**	**F**	**F**
Washington Blvd. to SR 238	**F**	**F**	C	C	**F**	**F**	**F**
SR 238 to Vargas Rd.	**F**	**F**	C	C	**F**	**F**	**F**
Vargas Rd. to Sheridan Rd.	**F**	**F**	C	C	**F**	**F**	**F**
Sheridan Rd. to Andrade Rd.	E	D	D	D	D	**F**	**F**
Andrade Rd. to SR 84 (West)	D	C	C	C	C	**F**	**F**
SR 84 (West) to SR 84 (East)	E	C	C	C	D	**F**	**F**
SR 84 (East) to Koopman Rd.	E	**F**	C	C	**F**	**F**	**F**

Note: **Bold** font indicates LOS F conditions.

A. The conditions reported represent the single evening peak commute hour (worst-case).
B. The Build Alternative may be constructed under a single construction contract or in multiple phases. The first phase of the Build Alternative (Phase 1) would include the construction of a new HOV/express lane facility on northbound I-680 from Auto Mall Parkway Boulevard to SR 84 (Vallecitos Road) in Alameda County, with an auxiliary lane between the Washington Boulevard on-ramp and Mission Boulevard (SR 238) off-ramp. Phase 1 also includes the construction of an approach lane from South Grimmer Boulevard to the start of the new HOV/express lane at Auto Mall Parkway. The "Phase 1" scenario represents the traffic conditions that would occur if only Phase 1 were constructed. The "Build Alternative" scenario represents the full build out of the Build Alternative (i.e., Phase 1 and future phases).

Source: Caltrans, 2014n

Table 2.1.7-3 Existing Peak Period Network Measures of Effectiveness

Measure	Results
Total Volume Served	98,964
Vehicle Miles of Travel	883,320
Person Miles of Travel	1,030,280
Total Travel Time (hours)	19,310
Average Travel Speed (mph)	45.8
Vehicle Hours of Delay	6,620
Person Hours of Delay	7,700

Note: System-wide measures of effectiveness are presented for the entire peak period (2:00 to 8:00 PM).
Source: Caltrans, 2014n

Vehicle Occupancy

Table 2.1.7-4 summarizes existing vehicle occupancy on northbound I-680 within the project limits. An HOV/express lane was recently constructed on the southbound side of this same I-680 corridor. According to a recent study, the southbound I-680 HOV/express lane has resulted in increased vehicle and person throughput in the corridor, improved average travel times in both the general purpose lanes and in the HOV/express lane, and increased average speeds across the corridor. Because this corridor primarily serves commuters that tend to follow similar daily and weekly travel patterns, the experience with the southbound HOV/express lane indicates that there is a demand for this type of facility in the northbound direction.

Table 2.1.7-4 Existing Vehicle Occupancy

Facility	Passenger Cars		
	Single Occupancy	2 Persons	3+ Persons
I-680 Mainline	83%	11%	2%
Ramps	83%	13%	2%

Source: Caltrans, 2014n

Collision Analysis

Mainline and ramp accident rates were obtained from Traffic Accident Surveillance and Analysis (TASAS) for the three-year period from July 1, 2008 to June 30, 2011. **Tables 2.1.7-5** and **2.1.7-6** summarize the collision data for the freeway mainline and ramps between Yosemite Drive and Koopman Road, summarized by the total number of accidents by fatality or injury.

Based on the accident collision data, there were a total of 514 accidents along the I-680 corridor between East Calaveras Boulevard (SR 237) and Koopman Road between 2008 and 2011. Over 60 percent of the accidents occurred between Mission Boulevard (SR 262) and Andrade Road. Actual accident rates averaged for the entire segment are less than the average statewide rate for comparable facilities. Rear-end collisions make up the majority of accidents within the traffic study area. This type of collision is generally associated with driver inattention, unsafe speeds, and/or lane changing in traffic congestion.

Table 2.1.7-5 Mainline Collision Data

Facility	Number of Accidents			Actual Accident Rate[1]			State Average Accident Rate[1]		
	Fatal	F+I[2]	Total	Fatal	F+I[2]	Total	Fatal	F+I[2]	Total
Yosemite Dr. to Scott Creek Rd.	0	25	65	0.000	0.10	0.27	0.004	0.26	0.85
Scott Creek Rd. to SR 262	0	20	58	0.000	0.13	0.37	0.005	0.28	0.90
SR 262 to SR 238	0	57	151	0.000	0.18	0.48	0.005	0.31	1.01
SR 238 to Andrade Rd.	0	49	175	0.000	0.19	0.69	0.006	0.21	0.63
Andrade Rd. to Koopman Rd. UC	0	29	65	0.000	0.18	0.40	0.010	0.27	0.75
Total	**0**	**180**	**514**	**0.000**	**0.16**	**0.45**	**0.006**	**0.27**	**0.83**

Notes:
1 Accident rates are measured in accidents per million vehicle miles
2 F+I = all accidents that are either fatal (F) or result in injury (I)
Source: Caltrans, 2014n

Table 2.1.7-6 Ramp Collision Data

Facility	Number of Accidents			Actual Accident Rate[A]			Average Accident Rate		
	Total	Fatal	F+I	Total	Fatal	F+I	Total	Fatal	F+I
NB Off Ramp to SR 237	8	0	2	**0.54**	0.00	**0.13**	0.25	0.002	.08
NB Off Ramp to SR 237 (EB Calaveras Rd.)	29	0	4	**5.14**	0.00	**0.71**	0.75	0.004	0.24
NB Off Ramp to SR 237 (WB Calaveras Rd.)	13	0	7	**1.38**	0.00	**0.74**	1.06	0.003	0.30
NB On Ramp from SR 237 (EB Calaveras Rd.)	2	0	0	0.30	0.00	0.00	0.72	0.002	0.21
NB On Ramp from SR 237 (WB Calaveras Rd.)	5	0	3	**1.44**	0.00	**0.87**	0.57	0.003	0.18
NB On Ramp from SR 237	1	0	0	0.10	0.00	0.00	0.18	0.001	0.06
NB Off Ramp to Jacklin Rd	9	0	2	**1.15**	0.00	0.26	1.01	0.003	0.35

Facility	Number of Accidents			Actual Accident Rate[A]			Average Accident Rate		
	Total	Fatal	F+I	Total	Fatal	F+I	Total	Fatal	F+I
NB On Ramp from Jacklin Rd	2	0	1	0.62	0.00	**0.31**	0.63	0.002	0.22
NB Off-Ramp to Scott Creek Rd.	0	0	0	0.00	0.00	0.00	0.25	0.002	0.08
NB Off-Ramp to WB Scott Creek Rd.	1	0	0	0.20	0.00	0.00	1.06	0.003	0.30
NB Off-Ramp to EB Scott Creek Rd.	0	0	0	0.00	0.00	0.00	0.75	0.004	0.24
NB On-Ramp from Scott Creek Rd.	0	0	0	0.00	0.00	0.00	0.63	0.002	0.22
NB Off-Ramp to SR 262	0	0	0	0.00	0.00	0.00	0.25	0.002	0.08
NB Off-Ramp to NB Mission Blvd.	3	0	2	**0.89**	0.00	**0.60**	0.75	0.004	0.24
NB Off-Ramp to SB SR 262	4	0	1	0.43	0.00	0.11	1.06	0.003	0.30
NB On-Ramp from SB SR 262	0	0	0	0.00	0.00	0.00	0.57	0.003	0.18
NB On-Ramp from NB Mission Blvd.	9	0	2	0.47	0.00	0.10	0.73	0.002	0.21
NB On-Ramp from SR 262	4	0	2	0.20	0.00	**0.10**	0.18	0.001	0.06
NB Off-Ramp to Durham Rd.	2	0	1	0.25	0.00	0.13	1.01	0.003	0.35
NB On-Ramp from Durham Rd.	0	0	0	0.00	0.00	0.00	0.72	0.003	0.24
NB Off-Ramp to Washington Blvd.	4	0	2	0.75	0.00	0.37	1.00	0.004	0.33
NB On-Ramp from Washington Blvd.	1	0	0	0.18	0.00	0.00	0.63	0.002	0.22
NB Off-Ramp to SR 238	2	0	0	0.34	0.00	0.00	1.01	0.003	0.35
NB On-Ramp from SR 238	1	0	1	0.14	0.00	0.14	0.72	0.003	0.24
NB Off-Ramp to Vargas Rd.	1	0	0	**2.83**	0.00	0.00	0.75	0.004	0.24
NB On-Ramp from Vargas Rd.	0	0	0	0.00	0.00	0.00	0.73	0.002	0.21
NB Off-Ramp to Sheridan Rd.	6	0	1	**4.64**	0.00	**0.77**	1.04	0.007	0.34
NB Off-Ramp to Truck Scales	1	0	0	**4.35**	0.00	0.00	0.77	0.003	0.07
NB On-Ramp from Truck Scales	0	0	0	0.00	0.00	0.00	0.55	0.002	0.05
NB Off-Ramp to Andrade Rd.	1	1	1	0.81	**0.806**	**0.81**	1.04	0.007	0.34
NB On-Ramp from	0	0	0	0.00	0.00	0.00	0.53	0.004	0.17

Facility	Number of Accidents			Actual Accident Rate[A]			Average Accident Rate		
	Total	Fatal	F+I	Total	Fatal	F+I	Total	Fatal	F+I
NB On-Ramp from Andrade Rd.	0	0	0	0.00	0.00	0.00	0.53	0.004	0.17
NB Off-Ramp to SR 84 (West)	1	0	0	**1.03**	0.00	0.00	0.90	0.014	0.36
NB On-Ramp from SR 84 (West)	2	0	0	**0.59**	0.00	0.00	0.44	0.005	0.14
NB Off-Ramp to SR 84 (East)	2	0	0	0.14	0.00	0.00	0.25	0.003	0.08
NB On-Ramp from SR 84 (East)	0	0	0	0.00	0.00	0.00	0.29	0.002	0.10

Notes: Actual accident rates shown in **bold** text exceed the statewide average for similar roadway facilities
A. Accident Rates are measured in accidents per million vehicle miles
Source: Caltrans, 2014n

Bicycle and Pedestrian Facilities

Within the traffic study area, bicycle and pedestrian travel occurs at the majority of cross street locations that intersect with the I-680 ramp termini. The Bay Area Ridge Trail and Sabercat Creek Trail are the only multi-use trail facilities adjacent to the I-680 freeway corridor, within the traffic study area. The Bay Area Ridge Trail between Mission Peak and Vargas Plateau crosses under I-680 at Vargas Road, in Fremont. The Sabercat Creek trail is located east of I-680, between Washington Boulevard and Durham Road.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Definition of Project Elements

As part of the traffic operations analysis conducted for this project, several configurations of the HOV/express lane beginning and end points were evaluated. The current project limits from SR 237 to north of SR 84 (Vallecitos Road) showed the most substantial benefits in traffic operations along northbound I-680. As a result of the traffic analysis and consultation with the project development team, the Build Alternative was defined based on the following considerations:

- The northern end of the express lane should be just north of SR 84 (Vallecitos Road). Terminating the express lane south of SR 84 would substantially limit the project's benefit.
- A new auxiliary lane between Washington Boulevard and SR 238 would produce substantial benefit to the corridor, by providing extra capacity at a major bottleneck location. Omitting this auxiliary lane would degrade the benefits created by the project.

- Auxiliary lanes should also be included between interchanges that do not currently have them between SR 237 and Auto Mall Parkway. This will be consistent with the interchange configurations on the southbound side of I-680, where auxiliary lanes are provided between each interchange, and will provide operational benefit by smoothing the merge and diverge maneuvers that contribute to intermediate bottlenecks.
- Consistent with other express lanes that are currently being planned and implemented in the Bay Area, the northbound I-680 express lane should allow continuous access between the express lane and the adjacent mixed-flow lane. Barrier separation of express lanes can be beneficial in controlling locations where there is likely to be substantial amounts of merging in and out of the express lane while the mixed-flow lanes are in queue. That is not the situation on the northbound I-680 corridor, particularly in the near-term. The major merging movements into and out of the express lane would occur in sections where the mixed-flow lanes are expected to flow relatively smoothly, so barrier separation is not anticipated to be beneficial.

Phase 1 – Initial Construction Phase

The Build Alternative may be constructed under a single construction contract or in multiple phases. The first phase of the Build Alternative (Phase 1) would include the construction of a new HOV/express lane facility on northbound I-680 from Auto Mall Parkway to SR 84 (Vallecitos Road) in Alameda County, with an auxiliary lane between the Washington Boulevard on-ramp and SR 238 (Mission Boulevard (SR 238)Road) off-ramp. Phase 1 also includes the construction of an approach lane from South Grimmer Boulevard to the start of the new HOV/express lane at Auto Mall Parkway. Beginning the express lane at Auto Mall Parkway rather than at SR 237, and thereby shortening the express lane by several miles, still results in substantial benefits to travelers using the I-680 corridor. This shorter segment of express lane (Phase 1 segment) is therefore a logical initial phase of construction for the Build Alternative.

Future Year Forecasts

Table 2.1.7-7 shows the overall level of traffic growth anticipated in the I-680 corridor under the 2020 and 2040 scenarios compared with the existing conditions (2011). As expected, traffic entering the I-680 corridor is anticipated to increase substantially by the year 2040, largely as a result of the local and regional residential and employment growth projected over that period. A comparison of the No-Build Alternative and Build Alternative conditions indicates the construction of the Build Alternative would result in a substantial number of motorists using the HOV/express lanes within the traffic study area. This increase is to be expected given the nature of the project and the overall level of traffic growth anticipated over this time period.

Table 2.1.7-7 Future Traffic Growth Summary

Scenario	Percent Growth (compared to 2011)	Annualized Growth Rate
2020 No Project	8%	0.85% per year
2020 with Project	11%	1.1% per year
2040 No Project	28%	0.85% per year
2040 with Project	37%	1.1% per year

Source: Caltrans, 2014n

Tables 2.1.7-8 and **2.1.7-9** show the I-680 segments within the traffic study area where the volume of carpool vehicles (2+ persons) is expected to be less than the lane capacity of 1,650 vehicles per hour in the proposed HOV/express lane. These segments are where the potential exists to “sell” the available HOV/express lane capacity to toll-paying single occupant vehicles. It is expected that all of the traffic study area segments along the I-680 corridor would have available capacity in the HOV/express lane to sell to single occupant vehicles in the construction year (2020). In the design year (2040), there would be available capacity in the southern part of the I-680 corridor, and in the northern part of the corridor during the hours outside of the peak commute period. Future traffic conditions within the project limits therefore have the capacity to accommodate the operation of an HOV/express lane.

Evening Peak Hour Performance

<u>Construction Year (2020)</u>

Tables 2.1.7-1 and **2.1.7-2** summarize future mainline and ramp operations along I-680 within the traffic study area, respectively. Under 2020 conditions, the Build Alternative would substantially improve the operations along the southern portion of the study corridor when compared to the No-Build Alternative. The Build Alternative would alleviate the bottleneck near Washington Boulevard and provide additional capacity for use by HOV users and toll-paying single-occupant vehicles. As a result of this additional capacity under the Build Alternative, the peak hour operations of the mixed-flow lanes would improve from LOS F to LOS D or better from SR 237 up to Andrade Road. However, the addition of new capacity would also allow more traffic to pass through the project limits, resulting in a new bottleneck forming near the I-680/Bernal Avenue on-ramp, with peak hour queues that extend back to SR 84. Beyond the Bernal Avenue interchange, the remainder of the I-680 corridor within the traffic study area would operate at LOS E or better up to the I-580 interchange.

Table 2.1.7-8 Year 2020, Freeway Segments with Available Capacity in HOV/Express Lane

Freeway Segment	Commute Period					
	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM
SR 237 to Jacklin	X	X	X	X	X	X
Jacklin to Scott Creek	X	X	X	X	X	X
Scott Creek to SR 262 (Mission)	X	X	X	X	X	X
SR 262 (Mission) to Auto Mall	X	X	X	X	X	X
Auto Mall to Washington	X	X	X	X	X	X
Washington to SR 238 (Mission)	X	X	X	X	X	X
SR 238 (Mission) to Vargas	X	X	X	X	X	X
Vargas to Sheridan	X	X	X	X	X	X
Sheridan to Andrade	X	X	X	X	X	X
Andrade to Calaveras	X	X	X	X	X	X
Calaveras to SR 84 East	X	X	X	X	X	X

Source: Caltrans, 2014n

While the additional capacity provided by the Build Alternative would be the main contributor to improved traffic conditions, dynamic toll pricing would also ensure efficient operations of the HOV/express lane. Tolls for express lanes change periodically based on real-time traffic volumes. During periods of lower congestion, the toll will be lower. The lower toll rates encourage more single-occupant vehicles to pay the toll and make use the additional capacity of the HOV/express lane. During peak commute periods, when there is more traffic congestion on the freeway, the toll to access the express lane will be higher. The higher toll rates discourage more single-occupant vehicles from using the HOV/express lane and encourage carpooling, both of which free up at-capacity conditions within the facility. By raising or lowering the toll in response to the level of traffic congestion, and therefore demand, this dynamic pricing effectively manages the volume of traffic in the HOV/express lane. As shown in **Table 2.1.7-1**, the HOV/express lane would be managed through dynamic pricing to operate at LOS C or better, with average travel speeds of 60 mph or faster.

Table 2.1.7-9 Year 2040, Freeway Segments with Available Capacity in HOV/Express Lane

Freeway Segment	Commute Period					
	2-3 PM	3-4 PM	4-5 PM	5-6 PM	6-7 PM	7-8 PM
SR 237 to Jacklin	X	X	X	X	X	X
Jacklin to Scott Creek	X	X	X	X	X	X
Scott Creek to SR 262 (Mission)	X	X	X	X	X	X
SR 262 (Mission) to Auto Mall	X	X	X	X	X	X
Auto Mall to Washington	X					X
Washington to SR 238 (Mission)	X					X
SR 238 (Mission) to Vargas	X					X
Vargas to Sheridan	X					X
Sheridan to Andrade	X					X
Andrade to Calaveras	X					X
Calaveras to SR 84 East	X					X

Source: Caltrans, 2014n

Under the Build Alternative, the overall severity of northbound I-680 traffic congestion in year 2020 would be substantially less than that expected under the No-Build Alternative. The duration of the traffic congestion at the worst bottleneck locations would be reduced from 5 hours to 3 hours, and the combined total distance of all queues would be reduced from 13 miles to 8 miles. The lowest peak hour speed on a single freeway segment would be about 24 miles per hour, compared to speeds of around 10 miles per hour on several segments under the No-Build Alternative.

Table 2.1.7-10 summarizes the 2020 conditions (using key MOEs) along I-680 within the traffic study area. When compared to the 2020 conditions under the No-Build Alternative, the Build Alternative would result in increased throughput and substantially more efficient operations of the I-680 corridor. The Build Alternative would result in an approximately 49 percent increase in average travel speed along the corridor, accommodate a 5 percent increase in traffic volume and 8 percent increase in vehicle miles of travel, with the overall time spent traveling reduced by 28 percent. The amount of delay experienced by motorists in 2020 would decrease by two-thirds under the Build Alternative. While the No-Build Alternative would not provide quite enough capacity to serve all of the vehicle demand in 2020, the Build Alternative would provide adequate capacity to serve the projected demand.

Table 2.1.7-10 Future PM Peak Period Measures of Effectiveness

Measure	Existing (2011)	Future Construction Year (2020)			Design Year (2040)		
		No-Build	Build		No-Build	Build	
			Phase 1	Full		Phase 1	Full
Freeway Volume Served	98,964	106,500	111,500 (+5%)	111,500 (+5%)	117,300	127,800 (+9%)	131,300 (+12%)
Percent Demand Served	--	98%	100%	100%	88%	89%	92%
Vehicle Miles of Travel	883,320	914,700	990,400 (+8%)	990,400 (+8%)	1,525,900	1,698,700 (+11%)	1,735,100 (+14%)
Person Miles of Travel	1,030,280	1,079,100	1,175,300 (+8%)	1,175,300 (+8%)	1,803,400	2,074,000 (+15%)	2,117,800 (+17%)
Total Travel Time (hours)	19,310	24,900	17,900 (-28%)	17,900 (-28%)	62,500	60,300 (-4%)	54,400 (-13%)
Average Travel Speed (mph)	45.8	37	55 (+49%)	55 (+49%)	24	28 (+17%)	32 (+33%)
Vehicle Hours of Delay	6,620	11,900	3,900 (-67%)	3,900 (-67%)	41,200	36,600 (-11%)	30,200 (-27%)
Person Hours of Delay	7,700	14,000	4,600 (-67%)	4,600 (-67%)	48,400	42,900 (-11%)	34,400 (-29%)

Note: System-wide measures of effectiveness are presented for the entire peak period (2:00 to 8:00 PM).
Source: Caltrans, 2014n

<u>Design Year (2040)</u>

Tables 2.1.7-1 and **2.1.7-2** summarize future mainline and ramp operations along I-680 within the traffic study area, respectively. Under 2040 conditions, the Build Alternative would distribute the projected increases in traffic volumes along the I-680 corridor, reduce the bottleneck around Washington Boulevard, and provide additional capacity for use by high occupancy vehicles and some toll-paying single occupant vehicles. There would be multiple intermediate bottlenecks along the I-680 corridor (such as at SR 262 and at the lane drop at SR 84 East). The queues resulting from those bottlenecks would merge together during the peak commute hour, resulting in slow speeds and LOS F conditions along much of

the traffic study area. Under the Build Alternative, the length of the most severe traffic queue would be substantially shorter than in the No-Build scenario; the full extent of the southernmost queue is estimated to extend for about 5 miles outside of the traffic study area, as compared to 13 miles under the No-Build Alternative. The HOV/express lane would operate at LOS D or better, with average travel speeds of 42 mph or faster.

As shown in **Table 2.1.7-10**, by 2040, the effects of the Build Alternative would be more modest as compared to 2020 conditions, but would still result in an increased throughput and more efficient operations of the I-680 corridor. When compared to the No-Build Alternative, the Build Alternative would increase the average travel speed by 33 percent, accommodate more traffic with the vehicle miles of travel increasing by 14 percent, while the overall time spent traveling would be reduced by 13 percent. The amount of delay experienced by travelers in 2040 would decrease by 29 percent with the implementation of the Build Alternative.

Neither the Build nor No-Build Alternative would provide enough capacity to serve all of the vehicle demand in 2040. The No-Build Alternative would serve 88 percent of the peak period demand, while the Build Alternative would accommodate 92 percent.

Safety

The draft Preliminary Safety Analysis completed for this project found that improvements to roadway visibility are essential to facilitate traffic flow and minimize the impacts caused by additional lane changing movements and maneuverings between the proposed express lanes and mixed flow lanes, particularly at the start and end of the project limits and at toll zone boundaries. To provide improved roadway visibility, the Build Alternative would provide enhanced lighting, signage and pavement delineation.

Nighttime lighting would be upgraded at ramp merges and diverges, and would also be added in the following areas:

- express lane entrance and at toll zone boundaries
- locations on the highway where visibility is restricted by barriers
- locations where the median width is narrow and drivers may be subjected to headlight glare
- locations where concentrations of nighttime accidents are known to have occurred

These elements of the Build Alternative are expected to reduce the number of accidents within the traffic study area.

Bicycle and Pedestrian Facilities

The Build Alternative proposes the following improvements to bicycle and pedestrian facilities:

- With the realignment of the Sheridan Road overcrossing, the Build Alternative would include the construction of on-street bicycle lanes (Class II) at Sheridan Road and Athenour Way.[24]
- The intersection at northbound I-680/SR 238 loop on-ramp termini would be modified, the sidewalk reconstructed, and ADA elements and crosswalk markings installed.[25]

These elements of the Build Alternative would create an overall beneficial effect to pedestrian and bicycle facilities in the surrounding communities.

Property of the Bay Area Ridge Trail and Sabercat Creek Trail would not be acquired or impacted as part of the Build Alternative, thereby avoiding direct effects to these trail facilities. The Bay Area Ridge Trail that crosses under I-680 at Vargas Road would remain open during construction and would not be impacted as part of the Build Alternative. Since the Build Alternative would not substantially alter the location of I-680, the distance between the existing bicycle and pedestrian facilities and the freeway corridor would not change when compared to existing conditions. No effects to pedestrian and bicycle facilities are anticipated (refer to **Section 2.1.2, Parks and Recreational Facilities**, for a complete discussion). The Build Alternative would not preclude the construction of any proposed bicycle and pedestrian improvements established in local plans or programs.

Phase 1 – Initial Construction Phase

In general, the traffic conditions detailed above for the Build Alternative are applicable to the Phase 1 segment. Implementation of Phase 1, with or without the future phases of the Build Alternative, would result in substantially more efficient operations of the I-680 corridor. **Tables 2.1.7-1** and **2.1.7-2** summarize future mainline and ramp operations along I-680 within the traffic study area, respectively. **Table 2.1.7-10** summarizes the future traffic conditions using key MOEs. Each of the aforementioned tables includes a “Phase 1” column that represents the traffic conditions that would occur within the Phase 1 segment without the implementation of the future phases of the Build Alternative (i.e., as if only the Build Alternative improvements within the Phase 1 segment were constructed).

[24] Per California Streets and Highways Code Section 890.4(b), “Class II bikeways, also known as "bike lanes," which provide a restricted right-of-way designated for the exclusive or semi exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and crossflows by pedestrians and motorists permitted."

[25] To allow people with disabilities to cross streets safely, state and local governments must provide curb ramps at pedestrian crossings where walkways intersect a curb. To comply with ADA requirements, the curb ramps provided must meet specific standards for width, slope, cross slope, placement, and other features.

Construction Year (2020)

Under 2020 conditions, the implementation of Phase 1 would have very similar effects on I-680 corridor-wide traffic operations when compared to the full build out of the Build Alternative (see **Table 2.1.7-10**). Construction of the Phase 1 improvements, without future phases, would result in somewhat lower travel speeds in the southern part of the corridor, but all freeway segments between SR 237 and Andrade Road would operate at LOS E or better (see **Table 2.1.7-1**). The HOV/express lane in the Phase 1 segment would operate at LOS C or better, with speeds of at least 60 mph. When compared to the full build out of the Build Alternative, the implementation of Phase 1 would result in the same effects on the northern part of the traffic study area, with a new bottleneck forming near the I-680/Bernal Avenue on-ramp.

Design Year (2040)

Under 2040 conditions, implementation of Phase 1 of the Build Alternative would result in the formations of multiple bottlenecks within the traffic study area. The traffic queues resulting from the bottlenecks would merge together during the peak hour, creating slow travel speeds and LOS F conditions along much of the I-680 corridor. With only the construction of improvements within the Phase 1 segment, the length of the most severe traffic queues would be shorter than in the No-Build Alternative, but longer than the traffic queues anticipated under the full build out of the Build Alternative. Implementation of Phase 1 would result in slower average travel speeds on most freeway segments when compared to the full Build Alternative. The HOV/express lane speeds would drop to between 40-50 mph on five segments, resulting in LOS E conditions. As shown in **Table 2.1.7-10**, the implementation of Phase 1 of the Build Alternative would result in improved corridor-wide operations as compared to the No-Build, but would have slower average speeds and greater levels of delay than the full build out of the Build Alternative.

Temporary Construction Impacts

As discussed in **Chapter 1.0**, **Proposed Project**, the Build Alternative would be constructed in multiple stages in order to minimize traffic delays and traffic congestion caused by construction activities. The exact staging of the construction phases would be determined during the final design process. It is anticipated that the proposed construction would require temporary roadway and shoulder closures.

No-Build Alternative

As presented in the analyses above (see **Table 2.1.7-10**), the forecasted increases in traffic volumes without capacity improvements would result in further deterioration in traffic congestion and slower vehicle speeds along northbound I-680. By year 2020, the bottleneck at Washington Boulevard is expected to cause substantial queuing during much of the evening peak commute period, with the queue extending beyond SR 237. Peak hour operations are expected to be at LOS F from SR 237 up to Washington Boulevard, with average travel speeds between 11 and 21 mph. Slow speeds between 21 and 41 mph (LOS F conditions) are also anticipated between Sheridan Road and SR 84 (Calaveras Road) due to the secondary bottleneck at that location. The total combined distance of all queues along the corridor would total 13 miles, and traffic congestion at the worst bottleneck would last for approximately five hours. Cumulatively, all of the vehicles during the six-hour evening peak period would experience almost twice as much vehicle-hours of delay compared to existing conditions, and the average travel speed would drop to 37 mph.

By 2040 with no improvements, the two bottlenecks effectively merge resulting in a substantial queue that exists for longer than the six-hour peak period and is estimated to extend for about 13 miles south of SR 237. Peak hour operations are expected to be at LOS F throughout the entire traffic study area. Cumulatively, all of the vehicles during the six-hour PM peak period would experience a six-fold increase in vehicle-hours of delay compared to existing conditions, with an average travel speed of 24 mph.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Measure TRA-1: A Traffic Management Plan (TMP) should be prepared during the detailed design phase for the Build Alternative, in accordance with Caltrans requirements and guidelines. The TMP should address traffic impacts from staged construction, detours, and specific traffic handling concerns during construction of the project. The objective of the TMP is to minimize the impacts that construction activities would have on the traveling public. Traffic management strategies that require action by the construction contractor should be presented in detail in the Build Alternative's technical specifications of the bid contract, and should be considered part of the project.

In implementing the TMP, Caltrans should produce and disseminate press releases and other documents, as necessary, to adequately notify and inform motorists, business community groups, local entities, emergency services, and elected officials of upcoming road closures and detours. This responsibility includes advance notification to local newspapers, television and radio stations, and emergency response providers. Caltrans construction staff should also submit weekly information regarding the daily traffic impacts to State facilities to the Caltrans District 4 Public Information Office. This information should be included in the Weekly Traffic Updates, which are dispersed to all news media outlets and other interested agencies.

Phase 1 – Initial Construction Phase

No avoidance, minimization, or mitigation measures specific to Phase 1 would be required beyond the implementation of the TMP, as described above under **Measure TRA-1**.

2.1.8 VISUAL/AESTHETICS

REGULATORY SETTING

The National Environmental Policy Act (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 United States Code [USC] 4331[b][2]). To further emphasize this point, the 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.

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

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.

Caltrans classified "Landscaped Freeways" are landscaped freeways with plantings that meet the State Outdoor Advertising Regulations criteria. Outdoor advertising displays are controlled and regulated along Classified Landscaped Freeways. Criteria for Landscaped Freeways include freeways with plantings within the state right-of-way that are continuous (no gaps ≥ 200 feet), ornamental (not functional), a least 1,000 feet long, on at least one side of the freeway, and require reasonable maintenance. Outdoor advertising is limited in these locations.

AFFECTED ENVIRONMENT

Information in this section is based on the Visual Impact Assessment prepared for this project (Caltrans, 2014o). The visual impact assessment was prepared in accordance with the guidelines in the FHWA *Visual Impact Assessment for Highway Projects* (FHWA, 1981). The study area for visual resources (visual resources study area) encompasses the project's viewshed, which is defined as the immediate areas in which proposed improvements would occur as well as areas that are visible from the project limits and views from off-site locations toward the project limits. The visual resources study area is determined by topography, vegetation, and viewing distance. Visual resources are identified below under state and local policies and guidelines. The visual setting section describes visual assessment units and key views.

State Policies and Guidelines

State Scenic Highway Program

Caltrans designated I-680 as an Official State Scenic Highway between Mission Boulevard (SR 238) in Fremont and the junction with SR 24 in Walnut Creek. Approximately one-third of the project limits (within the Phase 1 segment) are within the scenic corridor.[26] The scenic aspects of the corridor include the rolling wooded hills of the Contra Costa range contrasted with the flat Sunol Valley ringed by distance hills to the north and east.

I-680 from the Santa Clara County line to Mission Boulevard (SR 238) is *eligible* for designation as a state scenic highway, but not officially designated. A proposed state scenic highway changes from eligible to officially designated when the local governing body: (1) applies to Caltrans for scenic highway approval, (2) adopts a Corridor Protection Program, and (3) receives notification that the highway has been officially designated a Scenic Highway. To date, no such steps have been taken to officially designate the portion of the study limits within Santa Clara County. However, consideration of the similar scenic aspects of the corridor is included in this visual impact assessment.

According to the Caltrans Scenic Highway Guidelines, the merits of a highway nominated for scenic highway designation are evaluated on how much of the natural landscape a traveler sees and the extent to which visual intrusions impact the "scenic corridor". Visual intrusions may be natural or constructed elements, viewed from the highway, that adversely affect the scenic quality of a corridor. The proposed overhead express lane signs under the Build Alternative would represent new constructed visual intrusions within the scenic highway corridor that would adversely affect scenic quality (see *Environmental Consequences* discussion further below).

Caltrans Landscape Freeways

Currently, the segments of I-680 listed below are classified by Caltrans as Landscaped Freeways and meet the criteria of Caltrans outdoor advertising regulations.[27]

Santa Clara County:

- between the Yosemite Drive overpass (SCL PM 6.5) to just south of the Santa Clara/Alameda County border (SCL PM 9.93)

[26] Caltrans, 2012. *California Scenic Highway Program*. Accessed from http://www.dot.ca.gov/hq/LandArch/scenic_highways/scenic_hwy.htm

[27] Criteria for Landscaped Freeways include freeways with plantings within the state right-of-way that are continuous (no gaps ≥ 200 feet), ornamental (not functional), a least 1,000 feet long, on at least one side of the freeway, and require reasonable maintenance.

Alameda County:

- between the Alameda County line (ALA PM 0.0) and just north of the Mission Boulevard (SR 262) Interchange (ALA PM 2.85)
- between just south of the Grimmer Boulevard underpass (ALA PM 3.23) and the north side of the Auto Mall Parkway Interchange (ALA PM 4.07)
- between just south of Washington Boulevard (ALA PM 5.11) and north of the Mission Boulevard (SR 238) Interchange (ALA PM 6.62)

Local Policies and Guidelines

Local city and county land use plans were reviewed to identify goals and policies, and to provide insight into viewer sensitivity concerning visual resources in the visual resources study area.

The City of Milpitas' General Plan, Open Space & Environmental Conservation Element identifies principles to preserve and enhance the natural beauty of Milpitas as well as to establish a network of continuous and varied scenic routes that provide views of scenic resources, open space, and parks. Milpitas has not designated any portion of the I-680 corridor (within city limits) as a scenic corridor. However, Milpitas has designated the portion of I-680 between Montague Expressway and the Santa Clara County limit as a scenic connector. Different from a scenic corridor, a scenic connector provides access to scenic corridors or distant views. Guiding policies for scenic connectors establish measures to preserve scenic resources including limits on development height, enhance scenic views through landscaping, and minimize visibility of utilities and signage.

The Fremont General Plan, Community Character Element, designates the portion of the I-680 corridor from Mission Boulevard (SR 238) to the city limits as a scenic corridor. Mission Boulevard and Paseo Padre Parkway are also designated as scenic corridors. The General Plan encourages Caltrans to protect visual features in scenic corridors through landscaping and maintenance and to provide enhancement through distinguishing design techniques. Specifically, Implementation Policy 4-5.4.A encourages Caltrans to maintain open and landscaped rights-of-way at freeway interchanges, providing visual distinction between the freeway and city streets.

The East County Area Plan provides guiding principles for development and conservation in the East County Planning Area, which includes the portion of the project limits north of the Fremont border. The East County Area Plan contains polices aimed to protect regionally significant open space[28] and agricultural land from development and to preserve unique visual resources and protect sensitive viewsheds.

[28] The *East County Area Plan* Land Use Chapter II includes policies and goals for the protection of "Sensitive Lands and Regionally Significant Open Space". Specific open space areas that fall within the category of "regionally significant" include the Vargas Plateau and the Sheridan Road areas; Pleasanton Ridgelands; and West Dublin.

Visual Setting

The visual setting and visual quality of the study area can be described by three distinct visual assessment units. Visual assessment units are geographically discreet areas that are often separated by natural features such as bodies of water, ridges, or changes in vegetation. Each visual assessment unit has a certain visual character based upon its land uses and features. **Figure 2.1-8** depicts the location of these visual assessment units.

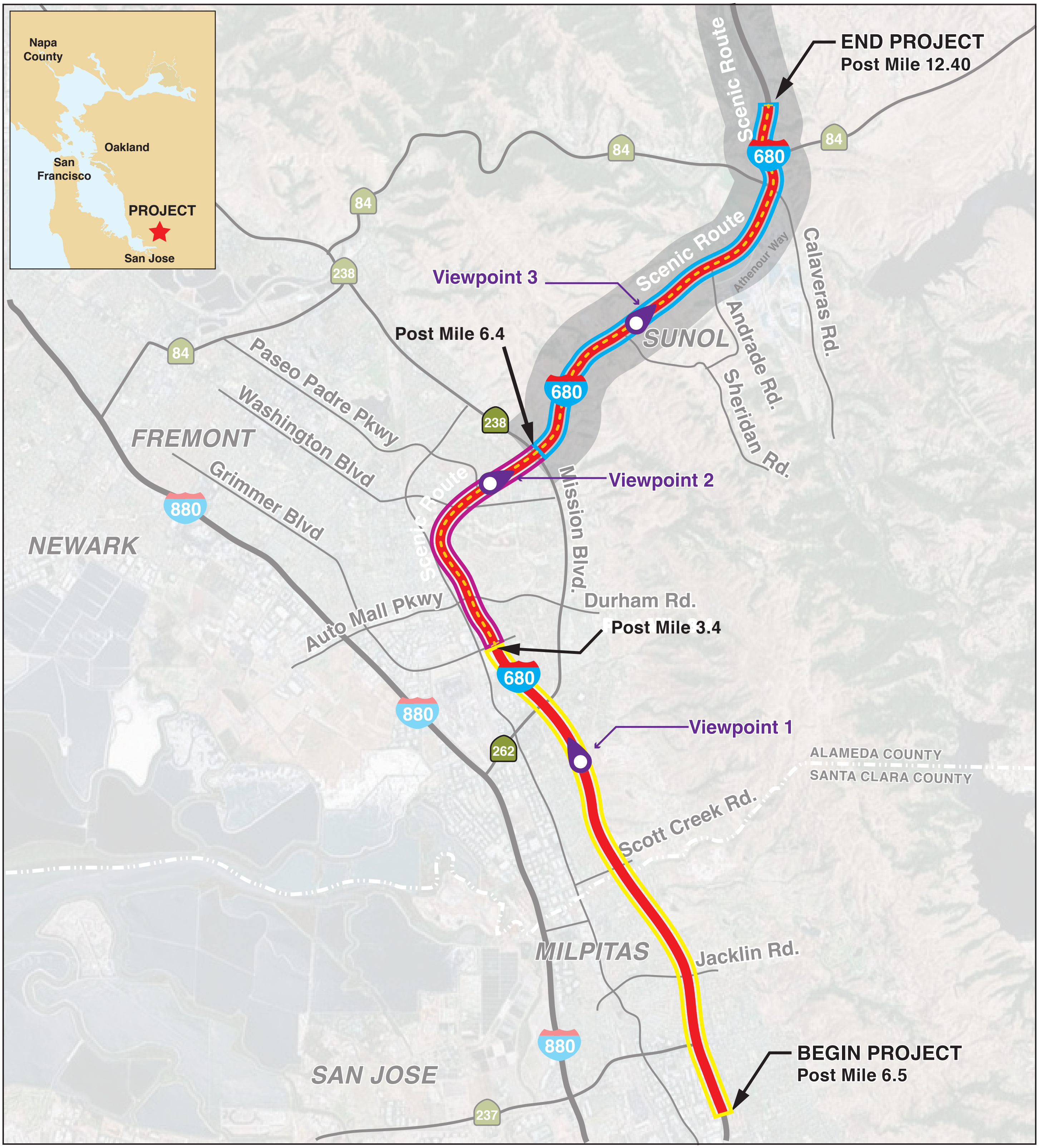
The immediate vicinity of the visual resources study area consists of urban development through Milpitas and Fremont and open hilly terrain in the unincorporated Alameda County area. Urban development consists of low-density residential neighborhoods from the flatlands to the foothills and scattered areas of low-density commercial development. The unincorporated Alameda County portion of the visual resources study area is mostly open space with rolling hillsides and scenic views. A gravel mine, a golf course, and agricultural developments break up the open space in the northern portion of the visual resources study area.

Visual Assessment Unit A

Visual Assessment Unit A includes the portion of the I-680 corridor from the southern-most project limit (SCL PM 6.5) in Santa Clara County to Grimmer Boulevard (ALA PM 3.35) in Alameda County. The northern half of Visual Assessment Unit A between from the county line (Scott Creek Road) to its northern limits is *eligible* for designation as a state scenic highway. This visual assessment unit is dominated by a suburban character and includes continuous residential, commercial, and industrial developments. Soundwalls and moderate vegetation separate the freeway from the surrounding neighborhoods. To the east of I-680, residential developments, soundwalls, and moderate vegetation increase the diverse visual texture of Visual Assessment Unit A. East-facing and distant views include undeveloped hilly terrain.

A clearing north of the Scott Creek Road provides a continuous line of west-facing and distant views of urban development that stretches to the City of San Jose, San Francisco Bay, and the peninsula ridgeline. At the same clearing, looking east on I-680, there is some residential land cover, but the undeveloped hills are visually dominant. Overall, the portion of I-680 in Visual Assessment Unit A is consistent with the suburban character of the area.

Visual Assessment Unit A includes mostly man-made development that creates a landscape similar in visual quality to many places in the San Francisco Bay Area. Distant San Francisco Bay views to the west and hills to the east of I-680 increase the landscape's overall appeal and harmony. As a result, the existing landscape in Visual Assessment Unit A has moderate-high vividness. The mixture of urban and natural land patterns result in moderate unity. The integrity of the landscape is moderately intact because Visual Assessment Unit A does not contain major visual intrusions.



Legend

Project Study Limits	Visual Assessment Unit A
Phase 1 Project Study Limit	Visual Assessment Unit B
Viewpoint Location	Visual Assessment Unit C

N

0 2 mi

Visual Assessment Units

Figure 2.1-8

Source: Caltrans, 2014o

Visual Assessment Unit B

Visual Assessment Unit B includes the portion of the I-680 corridor from Grimmer Boulevard (ALA PM 3.35) to the I-680/Mission Boulevard (SR 238) Interchange (ALA PM 6.38). All of Visual Assessment Unit B is *eligible* for designation as a state scenic highway. West of I-680 and south of Auto Mall Parkway, the visual character includes diverse textures of residential developments, industrial buildings, and commercial buildings. In some locations east of the I-680 corridor, soundwalls block views of hilly landform and residential land cover. The visual scale of I-680 in this portion of Visual Assessment Unit B harmonizes with the urban setting. The roadway corridor curves to the northeast direction and the landform transitions to include denser, natural land cover and vegetation on both sides of the roadway corridor while traveling north on I-680, after Auto Mall Parkway. Distant hilly landform is apparent.

Visual Assessment Unit B includes moderate man-made development, with some industrial and commercial areas, and natural land cover in the northern portion of this unit. The mixture of urban and natural land patterns result in moderate- high vividness and unity. The integrity of the landscape has moderate-high intactness, with few disturbances and visual intrusions.

Visual Assessment Unit C

Visual Assessment Unit C includes the portion of the I-680 corridor from the I-680/Mission Boulevard (SR 238) Interchange (PM 6.38) to the northernmost portion of the project study limits at Koopman Road (PM 12.4). I-680 throughout Visual Assessment Unit C is an officially designated state scenic highway. The character of Visual Assessment Unit C is unique compared to the southern portions of the visual resources study area, as undeveloped hills dominate the landform. Roadside vegetation mainly consists of grassland, but scattered planted trees and shrubs are prevalent and reflect the vegetative patterns throughout this unit. In the winter and spring, the hills are a soft green color, contrasting with darker green trees and vegetation to form the overarching skyline. Beyond the summit at Sheridan Road, I-680 makes a long descent down the Sunol Grade and across Alameda Creek where the valley is framed by the surrounding hills. I-680 traverses the valley bottom on a relatively straight alignment amid a golf course and low-density residential, industrial, and agricultural areas. Electrical transmission lines on steel lattice towers are visible. The highway corridor disrupts the visual continuity of the undeveloped landform, but does not strongly conflict with the rural character of this unit.

The hilly rural landform and natural land cover in Visual Assessment Unit C are striking to travelers, resulting in moderate-high vividness. The less common rural character of the landscape and its visually appealing topography produce moderate-high levels of unity and intactness.

Viewer Groups

Viewer groups within the visual resources study area include commuter traffic, local traffic, goods movement traffic, residents in the surrounding homes, and employees and patrons of the commercial businesses and agricultural businesses along the project limits. These viewer groups fall into two major categories: highway neighbors and highway users. Each viewer group has their own particular level of viewer exposure and viewer sensitivity, resulting in distinct and predictable visual concerns for each group that help to predict their responses to visual changes.

Highway Neighbors

There are relatively few highway neighbors that are exposed to prolonged views of the freeway within the project limits. For the majority of residential highway neighbors, views of I-680 are blocked by soundwalls, trees, and shrubs. On average, highway neighbors have low exposure to views of the freeway. Patrons of the exposed land uses (i.e., commercial, hotel, recreational) would likely focus on various activities that would take their awareness away from the freeway, and would thus have low sensitivity. Overall, highway neighbors have a viewer response of low.

Highway Users

Drivers traveling along at normal speeds typically focus their attention on long-range, non-peripheral views while maintaining focus on the roadways and traffic in front of them. Those that experience congested traffic conditions and slower speeds tend to notice views beyond the freeway itself. Tourists travelling to and from the San Francisco Bay Area on I-680 may also have an increased sensitivity of the visual environment, as these types of travelers may be more interested in the views they observe from the roadway. Overall, highway users would have a moderate-high response to changes within the project limits, especially considering the scenic highway status of I-680.

Existing viewer response for the visual study area is summarized in **Table 2.1.8-1.** An average viewer response (neighbors and users) of moderate is used to determine the level of visual impact for Visual Assessment Units A and B. Within Visual Assessment Unit C, highway neighbors are limited and sparse as I-680 climbs upgrade through the pass to the Sunol Valley. Visual changes, exposure, and sensitivity for the few highway neighbors in this unit are low because views of the project would be largely blocked by existing soundwalls, topography, and orientation of the land uses. Accordingly, because the lack of highway neighbors within this unit coupled with the highway users that would have a moderate-high response to resource changes, the overall viewer response is moderate-high in Visual Assessment Unit C.

Table 2.1.8-1 Viewer Response

Group	Viewer Exposure	Viewer Sensitivity	Averaged Viewer Response
Highway Neighbors	Low	Low	Low
Highway Users	High	Moderate	Moderate-High

Source: Circlepoint, 2014

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Three viewpoints were selected to represent existing views from the I-680 Corridor. These viewpoints best represent the visual character and quality and/or the unique visual resources of each Visual Assessment Unit, respectively. **Figure 2.1-8** provides a key to the location and direction of these viewpoints. Visual simulations were prepared at each viewpoint location to illustrate the future improvements under the Build Alternative.

Visual Assessment Unit A

<u>Resource Change</u>

Visual Assessment Unit A includes mostly man-made development that creates a landscape similar in visual quality to many places in the San Francisco Bay Area. For this reason, such landscapes are common throughout the region and the visual quality of the area is not particularly vivid for viewers.

Within Visual Assessment Unit A, the Build Alternative includes primarily inside (in the median) widening and some outside widening on northbound I-680; construction of several retaining walls; and new signage. Within this unit, the Build Alternative proposes seven retaining walls ranging between 560 to 3,500 feet in length and 4 to 21 feet in height. There are 25 proposed overhead signs (including 5 existing signs that would be relocated).

<u>Viewpoint 1</u>

Viewpoint 1, looking north from the center northbound I-680 lane several hundred feet north of Scott Creek Road, was selected to represent the general character of Visual Assessment Unit A. Northbound I-680 currently includes three traveling lanes with shoulders on each side. The visual simulation depicted in **Figure 2.1-9** illustrates how the addition of a travel lane in this area would not drastically alter the existing land cover or change the vividness. At Viewpoint 1, a new retaining wall would be slightly visible by highway users traveling in the northbound direction, but would not affect views of the San Francisco Bay. The new signage would dominate certain viewpoints and would disrupt the intactness and unity of the viewpoint.

Visual Assessment Unit A

The northern half of Visual Assessment Unit A between the county line (Scott Creek Road) to its northern limits (South Grimmer Boulevard) is *eligible* for designation as a state scenic highway. Visual Assessment Unit A includes mostly man-made development that creates a landscape similar in visual quality to many places in the San Francisco Bay Area. For this reason, such landscapes are common throughout the region and the visual quality of the area is not particularly vivid for viewers. Scenic hillsides to the north and east enter the view shed for northbound motorists approaching Mission Boulevard (SR 262). The new HOV/express lane signs that would be added to the I-680 corridor under the Build Alternative are typical of express lane corridors throughout the San Francisco Bay Area, with 13 overhead roadway signs currently installed on I-680 in the southbound direction within this unit. The proposed express lane signs would be consistent with the existing infrastructure along the freeway. The signs that would be installed towards Mission Boulevard (SR 262), while being highly visible to motorists, would not obstruct views of the surrounding hills. The visual intrusion of the proposed HOV/express lane signs would reduce the level of intactness and unity; and the overall visual quality would change from moderate to moderate-low in Visual Assessment Unit A. The resource change would be moderate-low.

The moderate viewer response coupled with a moderate-low resource change, would result in a moderate visual impact for Visual Assessment Unit A. **Table 2.1.8-2** summarizes the visual quality/resource change for Visual Assessment Unit A.

Table 2.1.8-2 Visual Quality Change from Visual Assessment Unit A

Alternative	Vividness	Intactness	Unity	Overall Visual Quality	Resource Change
Existing	Moderate-High	Moderate	Moderate	Moderate	N/A
No-Build Alternative	No Change	No Change	No Change	No Change	No Change
Build Alternative	Moderate-High	Moderate-Low	Moderate-Low	Moderate-Low	Moderate-Low

Source: Caltrans, 2014o

The sign elements of the Build Alternative would be designed per Caltrans *California Manual on Uniform Traffic Control Devices*.[29] Standard guide signs would use retroreflective paints and lettering, which work by reflecting light directly back from the point of origin. For example, the light emitted from cars' headlights hits the sign and is reflected directly towards the car. Similarly, any illumination of guide signs would be directed towards the sign, and would not affect the surrounding areas. Changeable message signs shall

[29] Caltrans, 2012. *California Manual on Uniform Traffic Control Devices*. Available online at: http://www.dot.ca.gov/hq/traffops/engineering/mutcd/ca_mutcd2012.htm; last accessed: June 3, 2014.

Existing Conditions in Viewpoint 1

Proposed Build Alternative Improvements in Viewpoint 1

Viewpoint 1

Figure

2.1-9

Source: Caltrans, 2014o

automatically adjust their brightness under varying light conditions to maintain legibility. Brighter illuminations of the changeable message signs during the day would not be used at night. None of the proposed signage would reflect light onto adjacent land uses.

Within Visual Assessment Unit A, the majority of the safety lighting installed under the Build Alternative would be between the I-680 freeway and interchange on-and off-ramps, more than 250 feet from any adjacent development. North of Jacklin Road, the lighting infrastructure would be along the northbound I-680 travel lanes, directly adjacent to the single-family homes along North Park Victoria Road, which are situated behind a soundwall. The additional lighting proposed as part of the Build Alternative would be designed with downward cast lighting, per Caltrans requirements, which prevents the illumination of areas outside of the freeway right-of-way. Due to the relative distance of the adjacent development, the location of the soundwalls, and design requirements, the proposed lighting would not directly affect the adjacent properties. Furthermore, because lighting infrastructure (local street lighting) already exists within the adjacent commercial, industrial, and residential areas, the additional lighting infrastructure along the freeway would not introduce substantial new sources of light for the surrounding areas.

Construction of the Build Alternative within Visual Assessment Unit A would remove approximately 0.5 acres of vegetation along the freeway shoulders. In general, the existing vegetation along the I-680 corridor is characterized as ruderal vegetation consisting primarily of weedy species and other non-native herbs. The Concept Landscape Plan prepared for the project identifies approximately 1.5 acres of areas within this unit that could be used for replacement planting within the environmental study limits established for the project footprint; resulting in a net gain of 1 acre of vegetation. Existing landscaping and other roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy. Replacing landscaping per Caltrans policy would reduce visual impacts due to vegetation removal in Visual Assessment Unit A.

Within Visual Assessment Unit A, post mile 6.5 to 9.93 (within Santa Clara County) and post mile 3.2 to 3.4 (within Alameda County) are classified landscaped freeway segments. Landscaping in this area is intermittent, as the I-680 frontage is developed with commercial buildings and soundwalls that protect the adjacent residential land uses. No vegetation or tree removal is anticipated that would create gaps in vegetation greater than 200 feet. In order to prevent indirect visual impacts from the declassification of the Landscaped Freeways, the landscape plans prepared during the final design phase of the project would incorporate certain specifications for replacement landscaping in this area, such that the criteria for the Landscaped Freeway would be maintained (see **Measure VIS-2**). Based on the preliminary designs for the Build Alternative improvements, the project is not anticipated to affect the Landscaped Freeways classification within Visual Assessment Unit A.

Visual Assessment Unit B

Resource Change

Visual Assessment Unit B includes moderate man-made development, with some industrial and commercial areas, and natural land cover in the northern portion of this unit. This unit includes wooded vegetation adjacent to some areas of I-680, along with the rolling hills of the Contra Costa range to the north and east.

Under the Build Alternative, improvements within Visual Assessment Unit B would include primarily inside (in the median) and some outside widening on northbound I-680, construction of 11 retaining walls (ranging between 50 and 1,850 feet in length and 4 to 24 feet in height). Up to nine overhead signs and five existing signs would be constructed or relocated within this unit. Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of a replacement noise barrier (NB Wall 13), located along northbound I-680, between Palm Avenue and Mission Boulevard (see **Section 2.2.7, Noise, Mitigation Measure NOI-A**). Replacement barrier NB Wall 13 would replace portions of the existing soundwall that would be removed under the Build Alternative, with an equivalent height of 14 feet. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision of the noise abatement will be made upon completion of the project design and the public involvement processes.

Viewpoint 2

Viewpoint 2, looking north from the center northbound I-680 lane between Paseo Padre Parkway and Palm Avenue, was selected to represent the general character of Visual Assessment Unit B. The wooded vegetation adjacent to some areas of I-680, along with the rolling hills of the Contra Costa range to the north and east are considered scenic features. The visual simulation depicted in **Figure 2.1-10** shows a typical retaining wall and overhead HOV/express lane sign from Viewpoint 2. The proposed roadway widening and retaining walls would reduce the vividness, intactness, and unity of the viewpoint, as man-made features would remove a substantial amount of natural land cover and vegetation.

Visual Assessment Unit B

All of Visual Assessment Unit B is *eligible* for designation as a state scenic highway. The new HOV/express lane signs that would be added to the I-680 corridor under the Build Alternative are standard throughout the San Francisco Bay Area, with 8 overhead roadway signs currently installed on I-680 in the southbound direction within this unit. The proposed signs in the northbound direction would thus blend with the existing character and quality of the I-680 corridor. The proposed express lane signs in this particular area would be highly visible but would not obstruct views of surrounding vegetation and the distant hills. The visual intrusion of the proposed HOV/express lane signs would reduce the level of intactness and unity from moderate-high to moderate. As depicted in **Figure 2.1-10**, the construction of large retaining walls along the hillsides, would further intrude on the natural land cover and contribute to further reduction in vividness and intactness, as well as reduce unity.

The overall visual quality would change from moderate-high to moderate in Visual Assessment Unit B. The overall resource change in Visual Assessment Unit B would be moderate. Combining a viewer response rating of moderate with the resource change of moderate, the overall visual impact would be moderate. **Table 2.1.8-3** summarizes the visual quality/resource change for Visual Assessment Unit B.

Table 2.1.8-3 Visual Quality Change from Visual Assessment Unit B

Alternative	Vividness	Intactness	Unity	Overall Visual Quality	Resource Change
Existing	Moderate-High	Moderate-High	Moderate-High	Moderate-High	N/A
No-Build Alternative	No Change	No Change	No Change	No Change	No Change
Build Alternative	Moderate-Low	Moderate	Moderate	Moderate	Moderate

Source: Caltrans, 2014o

As previously discussed, the sign elements of the Build Alternative would be designed per Caltrans *California Manual on Uniform Traffic Control Devices*. None of the proposed signage would reflect light onto adjacent land uses.

Within Visual Assessment Unit B, the majority of the safety lighting installed under the Build Alternative would be between the I-680 freeway and interchange on-and off-ramps, more than 250 feet from any adjacent development. North of South Grimmer Boulevard, the lighting infrastructure would be along the northbound I-680 travel lanes, directly adjacent to the single-family homes along Camellia Drive, which are situated behind a soundwall. The additional lighting proposed as part of the Build Alternative would be designed with downward cast lighting, per Caltrans requirements, which prevents the illumination of areas outside of the freeway right-of-way. Due to the relative distance of the adjacent development, the location of the soundwalls, and design requirements, the proposed lighting would not directly affect the adjacent properties. Furthermore, because lighting infrastructure (local street lighting) already exists within the adjacent commercial, industrial, and residential areas, the additional lighting infrastructure along the freeway would not introduce substantial new sources of light for the surrounding areas.

Existing Conditions in Viewpoint 2

Proposed Build Alternative Improvements in Viewpoint 2

Viewpoint 2 **Figure 2.1-10**

Source: Caltrans, 2014o

Construction of the Build Alternative within Visual Assessment Unit B would remove approximately 2.7 acres of vegetation along the freeway shoulders. In general, the existing vegetation along the I-680 corridor is characterized as ruderal vegetation consisting primarily of weedy species and other non-native herbs. The Concept Landscape Plan prepared for the project identifies approximately 1.8 acres of areas within this unit that could be used for replacement planting within the environmental study limits established for the project footprint; resulting in a net loss of 0.8 acres of roadside vegetation. Existing landscaping and other roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy. There are areas outside of the environmental study area that could be used for additional landscape replacement so that no net loss of vegetation occurs as a result of the Build Alternative. As discussed in the *Avoidance, Minimization, and Mitigation Measures* discussion below, replacement planting would likely be accomplished as a separate contract during the final design phase. As part of the final design effort, consideration of the environmental effects from any landscaping proposed outside of the environmental study area would be evaluated at that time. Replacing landscaping per Caltrans policy would reduce visual impacts due to vegetation removal in Visual Assessment Unit B.

Visual Assessment Unit B has existing classified Landscaped Freeway areas from the Grimmer Boulevard undercrossing (ALA PM 3.4) to the north side of the Auto Mall Parkway Interchange (ALA PM 4.07) and from south of Washington Boulevard (ALA PM 5.11) to south of the I-680/Mission Boulevard (SR 238) Interchange (PM 6.38). No vegetation or tree removal is anticipated that would create gaps in vegetation greater than 200 feet. In order to prevent indirect visual impacts from the declassification of the Landscaped Freeways, the landscape plans prepared during the final design phase of the project would incorporate certain specifications for replacement landscaping in this area, such that the criteria for the Landscaped Freeway would be maintained (see **Measure VIS-2**). Based on the preliminary designs for the Build Alternative improvements, the project is not anticipated to affect the Landscaped Freeways classification within Visual Assessment Unit B.

Visual Assessment Unit C

<u>Resource Change</u>

The character of Visual Assessment Unit C is unique within the study limits because it contains the freeway and mostly undeveloped hills as the dominant surrounding landform. Roadside vegetation mainly consists of grassland, but scattered planted trees and shrubs are prevalent and reflect the vegetative patterns throughout this unit. The hilly rural landform and natural land cover in Visual Assessment Unit C are striking to travelers, and represent the elements that qualify this unit as a scenic corridor.

Under the Build Alternative, improvements within Visual Assessment Unit C would include primarily inside (in the median) and some outside widening on northbound I-680 and the construction of 27 retaining walls (ranging between 4 and 24 feet in height and 100 and

2,966 feet in length). Up to 11 new overhead signs and 14 existing signs would be constructed or relocated within this unit. Grassland and shrub removal would be required in several locations along the outside northbound lane to accommodate proposed retaining walls and roadway widening.

Viewpoint 3

Viewpoint 3, looking north from the center northbound I-680 lane just after the Sheridan Road Bridge, was selected to represent the general character of Visual Assessment Unit C. The wooded vegetation adjacent to some areas of I-680, along with the rolling hills of the Contra Costa range to the north and east are considered scenic features that contribute to the official state scenic highway designation within this unit. The visual simulation depicted in **Figure 2.1-11** shows how northbound retaining walls would cut into the hillside to contain the steep slopes. Vegetation removal and roadway widening would be required in order to make room for the retaining wall, auxiliary lane, and HOV/express lane. The added HOV/express lane sign would alter the texture of the surrounding environment. On the southbound side, in this viewpoint, the roadway would be widened to accommodate the Sheridan Road Bridge replacement. As a result, a southbound retaining wall would be constructed to contain the steep slopes, but would be minimally visible to motorists on the northbound side.

Visual Assessment Unit C

I-680 throughout Visual Assessment Unit C is an officially designated state scenic highway. The new HOV/express lane signs that would be added to the I-680 corridor under the Build Alternative are standard throughout the San Francisco Bay Area, with 13 overhead roadway signs currently installed on I-680 in the southbound direction within this unit. The proposed signs in the northbound direction would thus be similar to the existing signs along the I-680 corridor and typical express lane signs seen along other Bay Area freeways. The signs in this particular area would block portions of the views of the surrounding hills for motorist travelling the corridor. This view blockage 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 reduce the level of intactness and unity from moderate-high to moderate. The visual intrusion of the new HOV/express lanes signs within the scenic corridor would be unavoidable. As depicted in **Figure 2.1-11**, retaining walls would intrude on the natural land cover and therefore contribute to this reduction in vividness and intactness, as well as reduce unity.

The overall visual quality would change from moderate-high to moderate in Visual Assessment Unit C. The overall resource change in Visual Assessment Unit C would be moderate. Combining a viewer response rating of moderate-high with the resource change of moderate, the overall visual impact would be moderate-high. **Table 2.1.8-4** summarizes the visual quality/resource change for Visual Assessment Unit C.

Table 2.1.8-4 Visual Quality Change from Visual Assessment Unit C

Alternative	Vividness	Intactness	Unity	Overall Visual Quality	Resource Change
Existing	Moderate-High	Moderate-High	Moderate-High	Moderate-High	N/A
No-Build Alternative	No Change	No Change	No Change	No Change	No Change
Build Alternative	Moderate	Moderate	Moderate	Moderate	Moderate

Source: Caltrans, 2014o

As previously discussed, the sign elements of the Build Alternative would be designed per Caltrans *California Manual on Uniform Traffic Control Devices*. None of the proposed signage would reflect light onto adjacent land uses.

Within Visual Assessment Unit C, the majority of the safety lighting installed under the Build Alternative would be within the I-680 freeway median, between the I-680 freeway and interchange on-and off-ramps, or along the northbound I-680 travel lanes where no development is located. The additional lighting proposed as part of the Build Alternative would be designed with downward cast lighting, per Caltrans requirements, which prevents the illumination of areas outside of the freeway right-of-way. Due to the relative distance of the adjacent development and design requirements, the proposed lighting would not directly affect the adjacent properties. Because there is limited development along this segment of I-680, the lighting infrastructure introduced along the freeway would introduce new sources of light for the surrounding areas. Because existing development is sparse, adverse effects from new sources of light related to the human environment would be minimal. New freeway lighting may illuminate areas that are used by smaller animal species during the night, making them easier to see and therefore more vulnerable to predation. These affects are discussed in detail in **Section 2.3.5, Threatened and Endangered Species**.

Construction of the Build Alternative within Visual Assessment Unit C would remove approximately 6.1 acres of vegetation along the freeway shoulders. In general, the existing vegetation along the I-680 corridor is characterized as ruderal vegetation consisting primarily of weedy species and other non-native herbs. The Concept Landscape Plan prepared for the project identifies approximately 1.7 acres of areas within this unit that could be used for replacement planting within the environmental study limits established for the project footprint; resulting in a net loss of 4.4 acres of roadside vegetation. Existing landscaping and other roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy.

There are areas outside of the environmental study area that could be used for additional landscape replacement so that no net loss of vegetation occurs as a result of the Build Alternative. As discussed in **Section 9.0, Avoidance, Minimization, and Mitigation Measures**, replacement planting would likely be accomplished as a separate contract during the final design phase. As part of the final design effort, consideration of the environmental effects from any landscaping proposed outside of the environmental study area would be evaluated at that time. Replacing landscaping per Caltrans policy would reduce visual impacts due to vegetation removal in Visual Assessment Unit C.

Visual Assessment Unit C has an existing classified Landscaped Freeway area from just south of the I-680/Mission Boulevard (SR 238) Interchange (ALA PM 6.38) to north of the Mission Boulevard (SR 238) Interchange (ALA PM 6.62). No vegetation or tree removal is anticipated that would create gaps in vegetation greater than 200 feet. In order to prevent indirect visual impacts from the declassification of the Landscaped Freeways, the landscape plans prepared during the final design phase of the project would incorporate certain specifications for replacement landscaping in this area, such that the criteria for the Landscaped Freeway would be maintained (see **Measure VIS-2**). Based on the preliminary designs for the Build Alternative improvements, the project is not anticipated to affect the Landscaped Freeways classification within Visual Assessment Unit C.

Summary of Visual Impacts

Table 2.1.8-5 summarizes the visual impacts for the Build Alternative and compares the narrative ratings for visual resource change and viewer response for each Visual Assessment Unit. Implementation of the Build Alternative would result in changes to the existing visual environment. Proposed overhead express lane signs would have varying degrees of impact throughout the study area, depending on the existing scenery and backdrop. The changes would be more evident Visual Assessment Unit C, the officially designated state scenic highway. The new sign structures, retaining walls, and vegetation removal would periodically disrupt motorists' views of the undeveloped hillsides and result in visual impacts ranging from moderate to moderate-high.

Table 2.1.8-5 Summary of Visual Impacts

Visual Unit	Build Alternative			No-Build Alternative		
	Resource Change	View Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
A	Moderate-Low	Moderate	Moderate	No Change		
B	Moderate	Moderate	Moderate			
C	Moderate	Moderate-High	Moderate-High			

Source: Caltrans, 2014o

Existing Conditions in Viewpoint 3

Proposed Build Alternative Improvements in Viewpoint 3

Viewpoint 3

Figure
2.1-11

Source: Caltrans, 2014o

Design elements of the Build Alternative with the potential to add new sources of light and glare would be designed to minimize adverse effects to adjacent land uses. The sign elements of the Build Alternative would be designed per Caltrans *California Manual on Uniform Traffic Control Devices*. None of the proposed signage would reflect light onto adjacent land uses. The majority of the safety lighting installed under the Build Alternative would be between the I-680 freeway and interchange on-and off-ramps, within the freeway median, and more than 250 feet from any adjacent development. Lighting infrastructure that would be along the northbound I-680 travel lanes, directly adjacent to the single-family homes, are in locations where the homes are situated behind a soundwall. The additional lighting proposed as part of the Build Alternative would be designed with downward cast lighting, per Caltrans requirements, which prevents the illumination of areas outside of the freeway right-of-way. Due to the relative distance of the adjacent development, the location of the soundwalls, and design requirements, the proposed lighting would not directly affect the adjacent properties. Furthermore, because lighting infrastructure (local street lighting) already exists within the adjacent commercial, industrial, and residential areas, the additional lighting infrastructure along the freeway would not introduce substantial new sources of light for the developed surrounding areas. Within Visual Assessment Unit C, new freeway lighting may illuminate areas that are used by smaller animal species during the night, making them easier to see and therefore more vulnerable to predation. These affects are discussed in detail in **Section 2.3.5, Threatened and Endangered Species**.

Temporary Construction Impacts

Highway users could expect visual impacts as a result of construction for a temporary duration. Short-term impacts would add visual intrusion and disturbances to the continuous line of the corridor and would reduce the intactness and unity of the visual resources in the study area.

Nighttime construction activities may temporarily add new sources of light and glare for residents, businesses, and local motorists along the I-680 corridor. As construction equipment and machinery would be stationed at any of the identified staging areas within the project limits, temporary sources of light and glare would be added to the Visual Assessment Units during the construction phase. However, temporary visual effects from the construction of the Build Alternative not considered to be substantial.

Phase 1 – Initial Construction Phase

Visual Assessment Units B and C of the visual resources study area are located within the Phase 1 segment of the Build Alternative. Refer to **Table 2.1.8-5** and the discussions above for a summary of the environmental consequences evaluated within the Phase 1 segment. Temporary construction impacts described under the Build Alternative would also apply to Phase 1.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not have any effect on visual resources. Transportation projects planned and funded within Alameda County and Santa Clara County would not be in the same viewshed as the Build Alternative and would avoid aesthetic and visual effects described in this section. The visual quality of the visual resources study area would remain the same.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Caltrans and the FHWA mandate that a qualitative/aesthetic approach should be taken to address visual quality loss in the project area. This approach fulfills the letter and the spirit of FHWA requirements because it addresses the actual cumulative loss of visual quality due to a project. This approach also results in avoidance, minimization, and/or mitigation measures that can lessen or compensate for a loss in visual quality. The inclusion of aesthetic features in the project design can help generate public acceptance of a project. This section describes additional avoidance, minimization, and/or mitigation measures to address specific visual impacts. These will be designed and implemented with concurrence of the District Landscape Architect.

Visual Assessment Unit C is part of the officially designated I-680 state scenic highway. Within the existing project limits, no other build alternatives were deemed viable because of the physical constraints associated with the developed land uses surrounding the I-680 corridor. Given these constraints, the current design of the Build Alternatives require that project improvements be constructed in the designated state scenic highway corridor. Construction of retaining walls, some roadside vegetation removal, and partial obstruction of scenic hillsides by new overhead signs cannot be avoided. Replacement planting would be provided and retaining walls and other structures would be given aesthetic treatments to reduce visual impacts.

Measure VIS-1: As directed by Caltrans, existing landscaping and other roadside vegetation removed by the Build Alternative should be replaced where proper setback exists and where feasible per Caltrans policy. If the cost estimate for replacement planting exceeds $200K, replacement planting would need to be accomplished as a separate contract, funded from the parent roadway contract, and must include a 3-year plant establishment period. Landscape plans should be developed during the final design phase and be approved by Caltrans.

Measure VIS-2: Replacement landscaping within the designated Landscaped Freeway locations must be planted such that the criteria for the Landscaped Freeway will be maintained. In these areas, planting must be continuous (no gaps ≥ 200 feet), ornamental (not functional), a least 1,000 feet long, on at least one side of the freeway, and require reasonable maintenance. The following locations within the project limits are designated Landscaped Freeway:

- Santa Clara County: PM 6.5 to 9.93
- Alameda County: PM 0.0 to 2.85, PM 3.23 to 4.07, PM 5.11 to 6.62

Measure VIS-3: To reduce the visual impact of new retaining walls and noise barriers, aesthetic treatments consisting of color, texture and/or patterning should be applied considered to reduce visual impacts. The aesthetic treatment should be context sensitive to the location and be compatible with existing walls in the area. If concrete drainage ditches are required along the top of and behind the retaining walls, the ditch should be stained to match the overall color of the wall. Aesthetic treatments should be developed during the final design phases and be approved by the Caltrans District Landscape Architect.

Measure VIS-4: Where required, retaining wall cable safety railing should have black or brown vinyl cladding to make them less obtrusive and help them blend with the setting.

Measure VIS-5: Concrete safety-shaped barriers should be sand blasted to a medium finish to minimize glare and deter graffiti. Barriers at the bottom of retaining walls should be stained to match the overall wall color if deemed appropriate by the Office of Landscape Architecture during the design phase.

Measure VIS-6: As directed by Caltrans, appropriate light and glare screening measures should be used at the construction staging areas including the use of downward cast lighting.

Phase 1 – Initial Construction Phase

The design requirements described above are applicable to the entire Build Alternative alignment, including Phase 1.

2.1.9 CULTURAL RESOURCES

REGULATORY SETTING

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

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800). On January 1, 2014, a Section 106 Programmatic Agreement (PA) between the Advisory Council, the FHWA, State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

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

AFFECTED ENVIRONMENT

The analysis in this section is based on the Historic Property Survey Report (HPSR) prepared for this project (Caltrans, 2014d). The HPSR incorporates the results of the Archaeological Survey Report (ASR), the Historical Resources Evaluation Report (HRER), the Environmentally Sensitive Area, and Archaeological Monitoring Area Action Plan (ESA and AMA Plan). The study area for cultural resources is identified by the archeological and architectural Area of Potential Effects (APE), which encompasses all areas that fall within the physical footprint of the proposed improvements (i.e., the Build Alternative) and areas that may either be directly or indirectly affected by project-related construction activities. The majority of the archeological and architectural APE is located within/along the existing Caltrans right-of-way along northbound I-680 with some exceptions, such as temporary construction/utility easements. The archeological APE covers 15.45 miles, encompasses 531.4 acres, and contains the full project footprint including all areas of direct impacts, the full horizontal extent of all project activities, and the boundaries of overlapping resources. The vertical APE varies greatly within the project APE, with excavation depths ranging from 2 feet for biofiltration strips to 25 feet for sign foundations.

The architectural APE generally follows the Caltrans right-of-way along northbound I-680, including bridges that span northbound and southbound I-680. The APE includes parcels that are intersected or directly affected by the project and contain built environment resources. Four built environment resources located outside the Caltrans right-of-way have been included because they may be affected by the project.

Archaeological Resources

An analysis of potential for buried sites, based on landform age and environmental characteristics, was conducted for land within 0.05 miles of the project limits. The results of this analysis show that just over 90 percent of the APE is categorized as having Extremely Low to Low potential for buried sites; 8.2 percent has Moderate potential and less than 1 percent has a High or Very High potential for buried sites. The most likely locations for buried sites are those in the High or Very High category. The project design was developed to avoid areas of High or Very High potential or to avoid impact depths that could potentially encounter buried deposits.

An archival records search and an archaeological field survey for the APE were conducted as part of the Archaeological Survey Report. One site, which is considered eligible to the National Register of Historic Places (NRHP) with the SHPO consensus, is within the APE. No surface archaeological material was observed at this site or elsewhere within the APE during the field survey.

Because the Build Alternative would include construction around, and shallow excavations in fill soil above the site, an ESA and AMA Plan were developed to protect the site against inadvertent adverse effects. The ESA and AMA Plan identifies protocol for establishing, installing, and monitoring an ESA to protect the site, and an AMA around each project element in close proximity to the site, which will be monitored by a qualified archaeologist to ensure that excavation does not exceed two feet into the native soils.

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

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code (PRC) Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), which will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Caltrans' PQS Archaeologist 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.

Historic Resources

A records search, review of historic and current maps, and field surveys were conducted to determine whether historical architectural resources were present within the APE. One historic-era property within the architectural APE, at 7587 Athenour Way, was previously evaluated. On March 19, 2003, the SHPO concurred with Caltrans' determination that this property is not eligible for listing in the NRHP.

Buildings and structures within the APE were recorded during fieldwork on February 11, 2013. Subsequent to the Section 106 PA application, four historic-era resources required full inventory and evaluation and are recorded on DPR 523 forms located in Attachment A of the HRER, and Appendix D of the HPSR. These resources were two rural-residential properties developed in the 1930s and 1960s, one circa 1966 electrical substation, and one electrical transmission line dating from 1908 to 1910. Seven bridges in the APE are 45 years or older, six of which were previously determined ineligible for the NRHP. One bridge is exempt from evaluation per the Section 106 PA.

Besides the property at 7587 Athenour Way, noted above, none of the built environment resources in the APE have been previously evaluated, and none are listed in or determined eligible for listing in the NRHP or the California Register. None of the four properties evaluated for this project appear eligible for listing in the NRHP or the California Register. In February 2013, letters were sent to ten potential interested parties associated with the historic-era properties. No responses were received from these letters.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Based on the investigations conducted, there is one archaeological site and four historic-era properties within the Build Alternative's APE. The Historic Property Survey Report determined no substantial adverse change to these resources.

ESA and AMA Plans were established to protect known cultural resources within the APE. ESA and AMA Plans include enforcement measures and standard conditions to support a finding of No Adverse Effect under Section 106. The plan was filed with the California State Historic Preservation Officer (SHPO) for concurrence. On January 13, 2014, SHPO issued a letter of concurrence for the *Finding of No Adverse Effect with Standard Conditions/ESA and AMA Action Plan* and the NRHP eligibility determinations for the architectural resources.

The Build Alternative would not result in the use (direct or indirect) of a historic property qualifying for protection under Section 4(f), as further outlined in **Appendix B**.

Native American Consultation

In January 2012, and in April 2013, Sacred Lands File searches conducted by the Native American Heritage Commission (NAHC) determined that no recorded resources are known within or near the APE.

The NAHC also provided a list of interested Native American groups and individuals in the study area. Letters requesting input from interested parties were sent to the Native American groups and individuals in January 2012, and an update letter describing the revised project limits in February 2013. Ms. Katherine Erolinda Perez, Ohlone/Costanoan, Northern Valley Yokuts; Bay Miwok, acknowledged her family history in the area and noted that there are several small waterways where sites can be expected. Ms. Katherine Erolinda

Perez recommended both an archaeologist and a Native American monitor if geoarchaeological trenching is conducted. Chairperson Ann Marie Sayers, Indian Canyon Mutsun Band of Costanoan asked for a summary of the records search findings and project impacts, and requested that a Native American monitor be present if archaeological monitoring or excavation is required. Chairperson Rosemary Cambra, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area is aware of cultural resources throughout the I-680 corridor and asked to be kept appraised of the project, archaeological project recommendations, and whether monitoring or other archaeological work occurs. Mr. Edward Ketchum, Amah Mutsun Tribal Band, responded that the project limits are outside of the Amah Mutsun traditional tribal boundaries.

Phase 1 – Initial Construction Phase

No surface archaeological sites would be affected by Phase 1 project activities. As currently planned, Phase 1 would not impact any potential buried archaeological deposits. No additional identification efforts are considered necessary.

No-Build Alternative

The No-Build Alternative would not change existing conditions; therefore, it would not affect any cultural resources.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Measure CUL-1: If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC who will then notify the MLD. At this time, the person who discovered the remains will contact Caltrans Professionally Qualified Staff (PQS) Archaeologist 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.

Measure CUL-2: 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. Additional study or survey will be needed if the project design changes or project limits are extended beyond the present survey limits.

Measure CUL-3: Per the ESA and AMA Action Plan, unintentional adverse effects on archaeological resources will be avoided by establishing ESAs and AMAs around the archaeological site boundaries within the APE, and the high-sensitivity locations within the project limits. The ESA will be designated by temporary orange-mesh fencing erected to bar entry into the site.

A summary of the ESA and AMA Action Plan tasks are outlined below. Caltrans shall inform interested Native Americans about the proposed project activities and the ESA and AMA Action Plan prior to construction.

- The Caltrans Archaeologist will review the final design package to ensure that the ESAs and AMAs are appropriately included in the plans and specifications, and can clearly guide construction, and will notify the appropriate Native American group.
- At least three weeks in advance, the Caltrans Resident Engineer and Archaeologist will coordinate to clearly delineate and install the ESAs and AMAs as specified.
- Prior to construction workers shall be informed of the ESA, the AMAs, and monitoring methods and expectations.
- The Caltrans RE and Archaeologist will coordinate prior to construction and ensure that a monitor is present.
- During construction, the Caltrans Archaeologist will periodically inspect the ESAs and monitor all construction activity within the designated AMAs. Post construction, the archaeologist will assist in any necessary post construction tasks.

Phase 1 – Initial Construction Phase

Under Phase 1, **Measure CUL-1** and **Measure CUL-2** described above for the Build Alternative will be implemented in the Phase 1 segment. There are no surface archaeological sites that would be affected by Phase 1 project activities; therefore, the measures in the ESA and AMA Action Plan (**Measure CUL-3**) do not apply to Phase 1.

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2.2 PHYSICAL ENVIRONMENT

2.2.1 HYDROLOGY AND FLOODPLAIN

REGULATORY SETTING

Executive Order (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 Federal Highway Administration (FHWA) requirements for compliance are outlined in Title 23 of the Code of Federal Regulations (CFR) Part 650, Subpart A.

In order 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 impacted 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."

AFFECTED ENVIRONMENT

Hydrology and Floodplains (hydrologic) information for this section is provided in the Location Hydraulic Study prepared for the project (Caltrans, 2014f). The Location Hydraulic Study Report incorporates information from the Federal Emergency Management Agency (FEMA), Flood Insurance Rate Maps (FIRM) for Alameda and Santa Clara Counties. The Location Hydraulic Study also incorporates information from United States Geological Survey (USGS) topographic maps, Oakland Museum of California watershed maps, aerial photographs, and a site visit conducted in October, 2012.

The hydrologic study area includes those streams, floodplains and watersheds within which the Build Alternative improvements will be located, as well as the receiving waterways, marshes, and wetlands that intersect and/or are adjacent to I-680.

Floodplains

Floodplains were defined using FEMA FIRMs, which categorize these floodplains into different Special Flood Hazard Areas:

- *Zone AE*. Floodplains identified as Zone AE represent areas with a one percent annual chance of flooding, where base flood elevations have been determined. Within a Zone AE floodplain, there are also regulatory floodway areas. A regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment, so that the one percent annual chance flood can be carried without substantial increases in flood heights.

- *Zone A*. Floodplains identified as Zone A represent areas with a one percent annual chance of flood inundation, where no base flood elevations have been determined.

- *Zone AO*. Floodplains identified as Zone AO represent areas within the one percent annual chance of flood inundation, with an average depth ranging from 1 foot to 3 feet.

- *Zone AH*. Floodplains identified as Zone AH represent areas within the one percent annual chance of flood inundation, with flood depths of 1 to 3 feet and base flood elevations determined.

According to the FIRMs, various portions of the hydrologic study area are identified as being within Zone X (shaded), which may represent areas of the 0.2 percent annual chance flood or one percent annual chance flood with a depth less than 1 foot. These areas are not considered to be within the base floodplain.

There are 31 streams and creeks crossings of I-680, 8 of which have established FEMA floodplains within the hydrologic study area. These include: Piedmont Creek, Arroyo de los Coches, Toroges Creek, Agua Fria Creek, Agua Caliente Creek, Canada del Aliso, Sabercat Creek, and Alameda Creek. There are two other established floodplains within the hydrologic study area: a Zone AH floodplain (local ponding) along I-680, approximately 400 feet north to 875 feet south of Yosemite Drive, and a Zone AO floodplain along North Park Victoria Drive. Portions of the floodplain along North Park Victoria Drive are located within the U.S. Department of Transportation's (Caltrans) right-of-way for northbound I-680.

Table 2.2.1-1 presents information on the ten floodplains within the hydrologic study area. The majority of the I-680 corridor is at a higher elevation than the surrounding floodplains, and as such, is not considered to be within a Special Flood Hazard Area (i.e., Zone X), and/or is not inundated during 100-year flood events.

Table 2.2.1-1 Floodplain Information

Approximate Floodplain Station	Flood Source	FIRM Panel(s)	SFHA at I-680	Inundates Freeway
1151+80	Local Ponding	06085C0067H	AH	Yes
1161+00	Piedmont Creek	06085C0067H	A	No
1182+00	Arroyo de los Coches	06085C0067H	X	No
1260+00	North Park Victoria Drive	060085C0059H	AO	No
1382+50	Toroges Creek	06001C0606G	X	No
1432+00	Agua Fria Creek	06001C0606G	X	No
1437+00	Agua Caliente Creek	06001C0606G	X	No
1517+00	Canada del Aliso	06001C0464G	A	No
1575+00	Sabercat Creek[1]	06001C0464G	X	No
1853+00	Alameda Creek[1]	06001C0460G 06001C0478G	AE	No

Note: SFHA = Significant Flood Hazard Area
1. Within Phase 1 segment
Source: Caltrans, 2014f

Natural and Beneficial Floodplain Values

Beneficial floodplain values include habitat for fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance, and ground water recharge. The floodplains in the hydrologic study area have many of these values, including wildlife habitat and plants. Several creeks are identified as potential habitat for special-status fish species. In addition, wetlands and marshes along the banks of the creeks provide habitat for federally and state-listed endangered animals. A complete description of the sensitive plant and animal habitats known to occur within the hydrologic study area is included in **Section 2.3, Biological Environment**.

Tsunamis

A tsunami is a series of waves generated in a body of water by a rapid disturbance that vertically displaces the water. These changes can be caused by an underwater fault rupture (that generates an earthquake) or underwater landslides (typically triggered by earthquakes). Based upon the Tsunami Inundation Map for Coastal Evacuation, the proposed improvements under the Build Alternative are not located in a tsunami inundation area.

ENVIRONMENTAL CONSEQUENCES

A "significant encroachment" as defined in 23 CFR 650.105 is a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction or flood-related impacts:

- a significant risk (to life or property)
- a significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route
- a significant adverse impact on natural and beneficial floodplain values

Build Alternative

Floodplain Encroachments and Risk of Action

Longitudinal Encroachment

As defined by the FHWA, a longitudinal encroachment is an action within the limits of the base floodplain that is parallel to the direction of the flow. No longitudinal encroachments have been identified as part of the Build Alternative, as the majority of the floodplains within the hydrologic study area run perpendicular to the I-680 corridor.

The FEMA floodplain along North Park Victoria Drive is located parallel to the proposed I-680 within the project limits. In this area, the Build Alternative would include construction of a retaining wall that would prevent the placement of fill or other alterations from occurring within this FEMA floodplain, and therefore would avoid longitudinal encroachments or adverse effects on this floodplain.

The local ponding floodplain along I-680, approximately 400 feet north to 875 feet south of Yosemite Drive, also runs parallel to the freeway. However, the Build Alternative improvements in this area only consist of restriping the existing roadway and would not affect existing ground conditions. Therefore, the Build Alternative actions would not constitute an encroachment within the existing floodplain in this area.

Risk of Action

The potential flood risks associated with implementation of the Build Alternative include: 1) change in land use, 2) fill inside the floodplain, or 3) change in the 100-year water surface elevation. **Table 2.2.1-2** presents the risk to the floodplains under the Build Alternative.

The Build Alternative proposes widening of northbound I-680 which would increase impervious surfaces and result in an increase in the storm water runoff/flow. However, this increase in storm water runoff would be insignificant when compared with the overall size of the watershed (less than 0.6 percent). Additionally, the proposed widening would not substantially raise the grade of I-680, thereby avoiding risks associated with redirected flood flows.

There are several locations where the Build Alternative would widen I-680 within the hydrologic study area floodplains of several creek crossings. With the exception of Alameda Creek, the widening would be accommodated on top of the existing culvert crossings under I-680 and no modification to the culverts would be necessary. In these locations no effect on the floodplain would occur.

Table 2.2.1-2 Added Impervious Area and Risk Summary

Approximate Mainline Station	Flood Source	Drainage Area (mi^2)	Drainage Area (ac)	Proposed Construction within FEMA Floodplain	Increase to Base (100 year) Flood Elevation (ft)	Total Added Impervious Area Draining to the Floodplain Build Alternative (ac)	% Added (Build Alternative)	Risk
"A" 1151+80	Local Ponding	-		No	0.0	0.00	-	Low
"A" 1161+00	Piedmont Creek	0.6	399	No	0.0	0.00	-	Low
"A" 1182+00	Arroyo de los Coches	4.0	2,560	No	0.0	0.59	0.023	Low
"A" 1260+00	North Park Victoria Drive	0.4	256	No	0.0	0.00	-	Low
"A" 1382+50	Toroges Creek	1.0	640	No	0.0	0.02	0.003	Low
"A" 1432+00	Agua Fria Creek	1.6	1,024	No	0.0	0.68	0.066	Low
"A" 1437+00	Agua Caliente Creek	2.1	1,344	No	0.0	0.12	0.009	Low
"A" 1517+00	Canada del Aliso	1.6	1,024	Yes	0.0	6.01	0.583	Low
"AR" 1575+00	Sabercat Creek[1]	2.0	1,280	No	0.0	1.21	0.094	Low
"B" 1853+00	Alameda Creek[1]	197.0	126,080	Yes	0.1	1.98	0.002	Low

Note: 1 Within Phase 1 segment
Source: Caltrans, 2014f

The Build Alternative would widen the east side of the I-680 Alameda Creek crossing. This would result in the placement of fill and support structures within the flow channel of the Alameda Creek floodplain. The direct placement of fill within this floodplain was modeled to determine the potential to increase the base flood elevation, and associated contribution to flood issues. Based on the results of the modeling (see **Table 2.2.1-2**), the amount of fill anticipated in the Alameda Creek floodplain under the Build Alternative would not result in a substantial increase in the base flood elevation (approximately 0.1 foot).

Flood risks as a result of the Build Alternative are anticipated to be low at all locations within the hydrologic study area.

Floodplain Development

As defined by the FHWA, the support of incompatible floodplain development will encourage, allow, serve, or otherwise facilitate incompatible base floodplain development, such as commercial development or urban growth. By improving access and highway capacity, the Build Alternative could indirectly result in the development and intensification of land uses in cities surrounding the project limits. This development intensification would most likely occur in areas already planned for growth by the surrounding cities, and would therefore not have a substantial effect on growth. The Build Alternative would add capacity in the northbound direction of I-680. However this additional capacity is needed to accommodate existing and anticipated traffic demand that would occur with or without the project. As a result, the Build Alternative would not directly encourage growth, nor would it promote local development or growth beyond that which is already planned. The Build Alternative would therefore not encourage incompatible floodplain development. A complete discussion of the Build Alternative's effects on regional growth is included in **Section 2.1.3, Growth.**

The Build Alternative would not result in the interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route in the event of a flood. In fact, the Build Alternative could improve access for emergency vehicles and evacuation by addressing existing and future traffic congestion through the addition of capacity on I-680 in the northbound direction.

Natural and Beneficial Floodplain Values

The Build Alternative would adversely affect wetlands and other waters in the hydrologic study area that provide natural beneficial floodplain values (i.e., wildlife and plant habitat, natural moderation of floods, water quality maintenance, and groundwater discharge). Direct effects would occur as a result of the physical displacement of existing wetlands and other waters from the construction of the proposed improvements. Indirect effects could also occur from fluid leaks from the construction equipment that is parked in close proximity to sensitive wetland habitat. In addition, erosion during construction work that involves grading and other earth moving activities can contribute large amounts of sediment and silt to storm water runoff, which can deteriorate the water quality of the wetlands and other waters that receive storm water runoff from the study area.

Section 2.2.2, Water Quality and Storm Water Runoff, addresses adverse effects to water quality anticipated from the implementation of the proposed improvements. **Section 2.3.2, Wetlands and Other Waters**, addresses adverse effects to wetlands and other waters within the hydrologic study area that provide natural beneficial floodplain values. Implementation of the avoidance, minimization, and mitigation measures identified in these later sections would reduce effects on natural and beneficial floodplain values within the hydrologic study area.

Summary

As the proposed improvements would generally maintain the existing roadway profile of I-680, the Build Alternative's effects to the floodplains would be minimal with regards to storm water runoff and changes in the 100-year water surface elevations. The Build Alternative would not encourage floodplain development in the surrounding areas. Therefore, no significant floodplain encroachment would occur under the Build Alternative.

Phase 1 – Initial Construction Phase

The risks associated with hydrology and floodplains described above for the Build Alternative are applicable to Phase 1. No significant floodplain encroachments would occur. The two floodplains within Phase 1 are the Sabercat Creek floodplain and the floodplain of Alameda Creek (see **Table 2.2.1-2**).

The impact to the floodplain at the Sabercat Creek crossing would be minimal. The existing culvert would not be modified as part of Phase 1. There will be widening of I-680 at the Sabercat Creek crossing, but the widening would occur on top of the existing culvert crossing of I-680. Therefore, the widening would not impact the Sabercat Creek floodplain. Additionally, Phase 1 would not substantially raise the grade of I-680. Widening under Phase 1 would result in increased impervious area draining into Sabercat Creek, but this increase would be insignificant compared to the overall watershed of the floodplain (less than 0.1 percent). The fill and increase in impervious area would not increase the base flood elevation. Therefore, the flood risk as a result of Phase 1 would be low at this location.

Phase 1 would include replacement and widening of the I-680 Alameda Creek crossing. This would result in the placement of fill and support structures within the flow channel of the Alameda Creek floodplain. However as discussed above, the direct placement of fill within this floodplain was modeled to determine the potential to increase the base flood elevation, and associated contribution to flood issues. Based on the results of the modeling (see **Table 2.2.1-2**), the amount of fill anticipated in the Alameda Creek floodplain under the Build Alternative is minimal and would not result in a substantial increase in the base flood elevation (approximately 0.1 foot).

No-Build Alternative

The No-Build Alternative assumes that the northbound I-680 would remain in its existing condition and no further action of improvements would occur. Under this alternative, the existing route would remain unchanged except for planned and approved projects within the project vicinity including the ramp metering, traffic operating systems (TOS), and pavement rehabilitation. The No-Build Alternative will therefore not affect the hydrology or result in floodplain development within the areas evaluated above.

AVOIDANCE, MINIMIZATION, AND /OR MITIGATION MEASURES

Build Alternative

The flood risks as a result of the Build Alternative are anticipated to be low at all locations within the hydrologic study area. As such, no avoidance, minimization, or mitigation measures are proposed related to flooding hazards. However, the Build Alternative would adversely affect wetlands and other waters in the hydrologic study area that provide natural beneficial floodplain values.

Measure HYDR-1: Construction of the Build Alternative will be planned so as to avoid adverse effects to the natural and beneficial floodplain values to the maximum extent practicable. Any impacts to the natural and beneficial floodplain values would be reduced with re-vegetation, storm water treatment, or other requirements as designated by the relevant permits.

Refer to **Section 2.2.2, Water Quality and Storm Water Runoff**, and **Section 2.3.2, Wetlands and Other Waters**, for a detailed description of the measures that shall be taken to protect water quality and the natural and beneficial floodplain values that would be affected by the Build Alternative.

Phase 1 – Initial Construction Phase

No avoidance, minimization, or mitigation measures specific to Phase 1 would be required beyond the one's described above under the Build Alternative.

2.2.2 WATER QUALITY AND STORM WATER RUNOFF

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 is in compliance with a National Pollutant Discharge Elimination System (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 U.S. Regional Water Quality Control Boards (RWQCB) 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 U.S. Army Corps of Engineers (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 Standard permits. There are two types of General permits: Regional permits and Nationwide permits. 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 Nationwide Permit may be permitted under one of the USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with United States Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (U.S. EPA Code of Federal Regulations [CFR] 40 Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA 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 USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) 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 LEDPA 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, Regional Boards designate beneficial uses for all water body segments, and then set criteria necessary to protect these 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 non-point 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, non-point, 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. RWCQBs 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 Municipal Separate Storm Sewer Systems (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 the Department as an owner/operator of an MS4 under federal regulations. The

Department's MS4 permit covers all Department 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.

The Department's MS4 Permit (Order No. 2012-0011-DWQ) was adopted on September 19, 2012 and became effective on July 1, 2013. The permit has three basic requirements:

1. The Department must comply with the requirements of the Construction General Permit (see below);
2. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and
3. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (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, the Department 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 Department 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 Department uses to reduce pollutants in storm water and non-storm water 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. 2009-009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (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 storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 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 Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the Clean Water Act (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 be in compliance 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 Regional Water Quality Control Board (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 Waste Discharge Requirements (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.

AFFECTED ENVIRONMENT

This analysis is based on the information provided in the Water Quality Assessment Report prepared for the project (Caltrans, 2014p). The analysis focuses on adverse effects to the water quality of the hydrologic study area, as defined in **Section 2.2.1, Hydrology and Floodplain.** The hydrologic study area is within the jurisdiction of the San Francisco Bay RWQCB, which implements water quality protection through the issuance of permits for projects found to be in compliance with the San Francisco Basin Plan Regional Hydrology.

Climate

The southern portion of the hydrologic study area (west of the Sunol Grade) has a marine climate with very little change in temperature. The northern portion (east of the Sunol Grade) has a slightly more variable climate. Rain falls mainly between October and April, with little or no rain during the summer months. In general, precipitation increases inland from the bay with increasing elevation and reaches a maximum average downfall at the top of the Contra Costa range. The precipitation decreases rapidly from the east of the hills. The average annual precipitation in the study area is about 14.5 inches, with monthly averages of approximately 0.5 inches between October and April.

Regional Hydrology

The San Francisco Bay RWQCB separates the San Francisco Bay Region into seven hydrologic planning areas. The hydrologic study area crosses three hydrologic sub-areas, each with their own respective planning watersheds. **Table 2.2.2-1** lists the hydrologic sub-areas and planning watersheds within the project's hydrologic study area.

Table 2.2.2-1 Hydrologic Planning Areas within the Project Hydrologic Study Area

<table>
<tr><th>I-680 Post Mile</th><th>Hydrologic Planning Area</th><th>Hydrologic Sub Area</th><th>Hydrologic Sub-area Number</th><th>Planning Watershed</th></tr>
<tr><td>SCl M6.5/M9.7</td><td>Santa Clara</td><td>Coyote Creek</td><td>205.30</td><td>Undefined</td></tr>
<tr><td>SCl M9.7/M9.9
Ala M0.0/M0.7
Ala M2.1/R6.5</td><td rowspan="3">Santa Clara[1]</td><td rowspan="3">Fremont Bayside[1]</td><td rowspan="3">205.20[1]</td><td>Newark Slough[1]</td></tr>
<tr><td>Ala M0.7/M2.1</td><td>Toroges Creek</td></tr>
<tr><td>Ala R6.5/R8.1</td><td>Mission Creek[1]</td></tr>
<tr><td>Ala R8.1/R11.7</td><td rowspan="2">South Bay[1]</td><td rowspan="2">Alameda Creek[1]</td><td rowspan="2">204.30[1]</td><td>Sheridan Creek[1]</td></tr>
<tr><td>Ala R11.7/R12.4</td><td>Vallecitos Creek[1]</td></tr>
</table>

Note:

1. Partly or entirely within Phase 1 segment

Source: Caltrans, 2014p

Groundwater Hydrology

The hydrologic study area extends through various groundwater sub basins, based on the San Francisco and Central Coast Basin Plans (see **Table 2.2.2-2**). Based on review of recent groundwater data located near the hydrologic study area (Caltrans, 2014f), groundwater flow generally follows the local topography. As a result, the peak of Mission Pass appears to create a groundwater divide where groundwater east of the peak appears to flow northeast toward Alameda Creek and groundwater west of the peak appears to flow west and southwest toward San Francisco Bay. Within the hydrologic study area, depth to groundwater below ground surface varies between 5 and 50 feet, with the deepest groundwater levels observed between Scott Creek Road and South Grimmer Boulevard where the local surface elevation is higher.

Table 2.2.2-2 Groundwater Basins within the Project Limits

Groundwater Basin Name	Groundwater Sub-Basin	Basin Number	Size (acres)
Santa Clara Valley	Santa Clara	2 – 9.02	153,600
Santa Clara Valley[1]	Niles Cone	2 – 9.01	65,800
Sunol Valley[1]	N/A	2 -- 11	16,600

Notes:

1. Partly or entirely within Phase 1 segment

Source: Circlepoint, 2014

Local Hydrology

Table 2.2.2-3 below identifies the creeks and stream crossings within the project limits.

Table 2.2.2-3 Waterway Crossings within the Project Limits

Stream Name	Crossing Types	Beneficial Uses
Piedmont Creek	Culvert	None listed
Arroyo de los Coches	Culvert	RARE, WARM, WILD, REC-1, REC-2
Tularcitos Creek	Culvert	WARM, WILD, REC-1, REC-2
Calera Creek	Culvert	WARM, WILD, REC-1, REC-2
Scott Creek	Culvert	WARM, WILD, REC-1, REC-2
DWR South	Bridge	None listed
Unnamed Creek	Culvert	None listed
Toroges Creek	Culvert	None listed
DWR North	Bridge	None listed
Unnamed Creek	Culvert	None listed
Agua Fria Creek	Culvert	WARM, WILD, REC-1, REC-2
Agua Caliente Creek	Culvert	WARM, WILD, REC-1, REC-2
Canada del Aliso	Culvert	WARM, WILD, REC-1, REC-2
Sabercat Creek[1]	Culvert	WARM, WILD, REC-1, REC-2
Washington Creek[1]	Culvert	None listed
Mission Creek[1]	Culvert	WARM, WILD, REC-1, REC-2
Unnamed Tributary to Mission Creek #1[1]	Culvert	None listed
Unnamed Tributary to Mission Creek #2[1]	Culvert	None listed
Unnamed Tributary to Mission Creek #3[1]	Culvert	None listed
Unnamed Tributary to Mission Creek #4[1]	Culvert	None listed
Unnamed Tributary to Mission Creek #5[1]	Culvert	None listed
Unnamed Tributary to Alameda Creek#1[1]	Culvert	None listed

Stream Name	Crossing Types	Beneficial Uses
Unnamed Tributary to Alameda Creek#2[1]	Culvert	None listed
Unnamed Tributary to Alameda Creek#3[1]	Culvert	None listed
Unnamed Tributary to Alameda Creek#4[1]	Culvert	None listed
Unnamed Tributary to Alameda Creek#5[1]	Culvert	None listed
Sheridan Creek[1]	Culvert	None listed
Alameda Creek[1]	Bridge	AGR, GWR, COMM, COLD, MIGR, RARE, WARM, WILD, REC-1, REC-2
Vallecitos Creek[1]	Culvert	WARM, WILD, REC-1, REC-2

Notes:
Existing beneficial uses:
AGR—Agricultural Supply
GWR—Groundwater Recharge
COMM—Ocean, Commercial, and Sport Fishing
COLD—Cold Freshwater Habitat
MIGR—Fish Migration
RARE—Preservation of Rare and Endangered Species
SPWN—Fish Spawning
WARM—Warm Freshwater Habitat
WILD—Wildlife Habitat
REC-1—Water Contact Recreation
REC-2—Non-contact Water Recreation

1. Partly or entirely within Phase 1 segment

Source: Caltrans, 2014p

Beneficial Uses

As previously discussed in **Section 2.2.1, Hydrology and Floodplain**, the water bodies within the hydrologic study area have many of natural beneficial values, including wildlife habitat and plants. Several creeks are identified as potential habitat for special-status fish species. In addition, wetlands and marshes along the banks of the creeks provide habitat for federally and state-listed endangered animals. The San Francisco Basin Plan lists beneficial uses for creeks and stream crossings within the project limits. **Table 2.2.2-3** summarizes the beneficial uses for these water bodies. A complete description of the sensitive plant and animal habitats known to occur within the hydrologic study area is included in **Section 2.3, Biological Environment**. There are no *Areas Of Special Biological Significance*, as designated by the SWRCB, within the study area.

Water Supply

There are no known drinking water reservoirs or recharge facilities within the hydrologic study area. The Hetch Hetchy Aqueduct and its associated branches cross under I-680 twice near the Vargas Road undercrossing and again at Mission Boulevard (SR 262). The aqueduct crosses I-680 in a closed conduit and is maintained by the San Francisco Public Utilities Commission.

Clean Water Act 303(d) List

The general water quality objectives established for surface waters within the San Francisco Bay region include bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, population and community ecology, pH, radioactivity, salinity, sediment, settleable material, suspended material, sulfide, taste and odors, temperature, toxicity, turbidity, and un-ionized ammonia. Alameda Creek and Arroyo de la Laguna are the only receiving water bodies within the hydrologic study area included on the CWA 303(d) List of Water Quality Limited Segments, and therefore do not meet state water quality standards. Both water bodies are listed as impaired for diazinon. Diazinon is commonly found in chemicals used for landscaping and is released into water bodies as runoff from the irrigation of lawns and landscapes areas in developed neighborhoods. Because diazinon is not common in roadway runoff, the project does not need to consider treatment or target this pollutant when designing the drainage systems. Currently, Caltrans is not required to mitigate for the diazinon TMDLs. However, Caltrans and SWRCB are coordinating a permit amendment for diazinon's wasteload allocation, required compliance, and Caltrans' level of responsibility.[1]

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The Build Alternative would result in adverse temporary construction related and permanent operation related effects to water quality, as described below. Avoidance and minimization measures are proposed for project construction and design that would prevent adverse effects from occurring.

Effect to Receiving Waters

<u>Temporary Construction Related Effects</u>

Construction would involve substantial grading and earth moving activities, stockpiling of soils, and the loading, unloading, and transport of excavated and fill material. Rainfall could carry loose soils into adjacent waterways, resulting in increased sedimentation and adverse effects to water quality. Concentrated flow due to grading in some areas will increase the potential for erosion and for sediment transport into the adjacent areas. Construction equipment debris and fuel could also further degrade the quality of storm water runoff if fueling activity and maintenance products are not handled properly. This contamination could impact nearby waterways, including the mapped creeks and wetlands in the hydrologic study area.

Work within waterways can result in changes in creek characteristics at the crossing and upstream and downstream of the crossings through widening and replacement of existing culverts and bridges. Although the goal of the project design would be to maintain existing drainage structures, the proposed road widening and modifications to the existing freeway and ramps could also result in modifications or removal of the exiting drainage structures. Temporary drainage facilities may be required during construction to redirect runoff from work areas. Temporary measures that will control pollutant discharges during construction activities are described in **Table 2.2.2-5**.

<u>Permanent Operation Related Effects</u>

The Build Alternative would add approximately 29 acres of new impervious area, the bulk of which would be added in Phase 1 (approximately 22 acres) through road widening and modifications to

[1] Order 2014-XXXX-DWQ (Draft), Amending National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit for State of California Department of Transportation (Order 2012-0011-DWQ) NPDES NO. CAS000003

the existing roadway and ramps. The proposed widening and modifications to the existing freeway and ramps are expected to result in the fill or removal of existing ditches, modification or relocation of existing longitudinal drainage structures, and construction of new drainage structures. The goal of the Build Alternative's drainage design would be to maintain existing drainage patterns; however, during construction, temporary drainage facilities may be required to redirect runoff from work areas. The disturbed soil area and existing added and reworked impervious area values for the Build Alternative and Phase 1 are shown in **Table 2.2.2-4**.

Additional impervious area prevents runoff from naturally dispersing and infiltrating into the ground, resulting in increased concentrated flow. The additional flow has the potential to transport an increased amount of sediment and pollutants to waterways and water resources, plus create increased erosion resulting from changes to waterway hydrographs (flow versus time) pre and post construction. This phenomenon is termed hydromodification.

Table 2.2.2-4 Disturbed Soil and Impervious Area Values

Planning Watershed	Build Alternative				Phase 1			
	Disturbed Soil (ac)	Impervious Area (ac)			Disturbed Soil (ac)	Impervious Area (ac)		
		Existing	Added	Reworked		Existing	Added	Reworked
Undefined	11	38	3	8				
Newark Slough	19	68	9	10	16	35	7	4
Toroges Creek	6	17	2	4				
Mission Creek	10	22	4	2	10	22	4	2
Sheridan Creek	23	51	9	5	23	51	9	5
Vallecitos Creek	4	10	2	1	4	10	2	1
Total	73	206	29	30	53	118	22	12

Source: Caltrans, 2014p

Hydromodification would occur in areas that drain to unlined channels. Areas that may drain to hardened channels or culvert systems, or areas that discharge to tidally influenced waterways are not subject to hydromodification. Based on the natural conditions of Toroges Creek, Mission Creek and Vallecitos Creek, these areas are susceptible to hydromodification as a result of the impervious surfaces added with the construction of the Build Alternative.

The additional paved roadway surfaces that would be created under the Build Alternative would allow for an increased area for deposition of sediment and other pollutants from vehicular traffic that could be discharged from I-680 within the hydrologic study area, adversely affecting water quality in the area.

The Build Alternative proposes work within and near water bodies that are identified as Waters of the state and Waters of the U.S.; therefore, a 404 Permit from USACE and a 401 Water Quality Certification from the San Francisco Bay RWQCB will be required. Because the project limits are within the Santa Clara County and Alameda County Phase I MS4, all infiltration and hydromodification changes would be required to comply with the San Francisco Bay RWQCB Municipal Regional Storm Water NPDES Permit. Additional permits for the Build Alternative may include, but are not limited to, a 1602 Streambed Alteration Agreement from the California Department of Fish and Wildlife, and a Biological Opinion from the U.S. Fish and Wildlife Service (see **Section 2.3, Biological Environment**).

Each of the permits or agreements will detail specific temporary and permanent impacts to the appropriate jurisdiction, required actions to be used to avoid or minimize impacts to water resources, including special-status species associated with those resources, and detail specific mitigation efforts to enhance or restore these areas. Any impacts to the special-status species associated with the waterways within the hydrologic study area would be reduced or avoided with re-vegetation, storm water treatment, or other requirements as designated by the relevant permits. Refer to **Section 2.3.2, Wetlands and Other Waters,** and **Section 2.3.4, Animal Species**, for a detailed description of the measures that shall be taken to protect water quality with respect to the special-status species would be affected by the Build Alternative.

Effects to Groundwater

<u>Temporary Construction Related Effects</u>

The groundwater depth beneath the study area ranges from shallow and close to the surface to a depth of 50 feet. Construction activities, such as excavation, could intrude into the groundwater table. If exposed, rainfall could carry loose soils and pollutants into the groundwater table, resulting in increased sedimentation and adverse effects to groundwater quality. Contamination of the groundwater could also occur during construction activities that require dewatering (the removal of water from the subsurface prior to construction work). Temporary measures related to the protection of groundwater during construction activities are described below.

<u>Permanent Operations Related Effects</u>

As previously discussed, this Build Alternative would result in the addition of impervious area and reduce the available unpaved area that previously allowed runoff to infiltrate into the native soils. The reduction of runoff infiltrating through native soils has the potential to result in loss in volume or amount of water that previously recharged localized aquifers and reduce regional groundwater volumes. However, the increase in impervious area associated with the Build Alternative would not result in a measurable change to groundwater recharge, when compared to the overall size of the watersheds (see **Table 2.2.2-2**).

Phase 1 – Initial Construction Phase

The adverse effects to receiving water bodies and groundwater described above for the Build Alternative are applicable to Phase1. Phase 1 would add approximately 22 acres of new impervious area through road widening and modifications to the existing roadway and ramps. Work within the water way crossings to widen or replace existing bridges and culvert structures would also occur under Phase 1. The disturbed soil area and existing added and reworked impervious area values Phase 1 are shown in **Table 2.2.2-4**.

Hydromodification impacts would occur in areas that drain to unlined channels. Within Phase 1, the areas from North Mission Boulevard (SR 238) to State Route 84 (SR 84) are likely to include waterways susceptible to hydromodification.

No-Build Alternative

The No-Build Alternative would not result in any physical changes or operational improvements to I-680. Existing storm water treatment systems would remain unchanged. The No-Build Alternative may have the potential for permanent water quality impacts due to increased traffic congestion resulting in a greater deposition of pollutants from exhaust and from braking of vehicles. The currently planned and funded projects within the hydrologic study area would be required to adhere to the applicable state requirements and permitting issued by San Francisco Bay RWQCB, which would protect water quality in the study area under separate review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Construction activities and operation of the roadway improvements would be regulated under the applicable Caltrans' NPDES permits and SWMP, which regulate storm water discharge from activities on local roadways. The design features to address adverse effects to water quality are a condition of Caltrans' NPDES permit, Construction General Permit, San Francisco Bay RWQCB Municipal Regional Storm Water NPDES Permit, and other regulatory agency requirements.

To eliminate run-off of sediment from the proposed work area during and after construction, the Caltrans Storm Water Quality Handbooks – Project Planning and Design Guidelines would be used to determine the BMPs that are appropriate to install. The potential for adverse effects to water quality will be avoided by implementing temporary and permanent BMPs outlined in the Caltrans' Standard Specifications. Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion.

Implementation of details for these design features or BMPs would be developed and incorporated into the Build Alternative during the final design phase. Preliminary design of the stormwater treatment areas for the Build Alternative is complete, as described in **Section 1.3.1, Project Alternatives**. The measures below outline the temporary and permanent BMPs to be implemented, at a minimum, but also incorporate project-specific requirements for the protection of the natural values of the waterways, and the special status species present within and adjacent to the project limits (see **Section 2.3, Biological Environment**).

Measure WQ-1*:* Temporary Construction Best Management Practices (BMPs). A Storm Water Pollution Prevention Program (SWPPP) would be developed for the project and would comply with the Caltrans SWMP which includes guidance for Design staff to include special provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges. Water quality inspector(s) will inspect construction areas after a rain event to ensure that the storm water BMP's are adequate.

The SWPPP would reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges. **Table 2.2.2-5** outlines temporary BMPs to be implemented, at a minimum. Further evaluation of the BMPs necessary for the Build Alternative to comply with the permits and other regulatory agency requirements would be detailed during the final design phase. The temporary BMPs identified for the Build Alternative include measures specific to the protection of the natural values of the waterways that cross the project limits, as well as measures to reduce adverse effects to special-status species likely to occur in the areas of proposed improvements (see **Section 2.3, Biological Environment**).

Table 2.2.2-5 Temporary BMPs

Temporary BMPs	Purpose
Soil Stabilization	
Move-In/Move-Out	Mobilization locations where permanent erosion control or revegetation to sustain slopes is required within the projects limits
Temporary Cover	Plastic covers for stockpiles
Temporary Fence (Type ESA)	High visibility fence to designate areas off-limits to the contractor
Sediment Control	
Temporary Fiber Rolls	Degradable fibers rolled tightly, or coir rolls, and placed on the toe and face of slopes to intercept runoff
Temporary Silt Fence	Linear, permeable fabric barriers to intercept sediment-laden sheet flow. Placed downslope of exposed soil areas, along channels and project perimeter
Temporary Netting	Erosion control netting such as jute or coir rolls installed at base of slope
Temporary Gravel Bag Berm	Single row of gravel bags installed end to end to form a barrier across a slope to intercept runoff. Can be used to divert or detain moderately concentrated flows
Temporary Check Dams	Small constructed device of rock or other product placed across a channel or ditch to reduce flow velocity
Temporary Drainage Inlet Protection	Runoff detainment devices used at storm drain inlets that is subject to runoff from construction activities

Temporary BMPs	Purpose
Tracking Control	
Temporary construction entrances/exits	Points of entrance/exit to a construction site that are stabilized to reduce the tracking of mud and dirt onto public roads
Street Sweeping	Removal of tracked sediment to prevent them entering a storm drain or watercourse
Non-Storm Water Management	
Temporary Creek Diversion	For work within live creeks. Prevents sediment and water from disrupting construction activities
Revegetation	For areas disturbed by construction, pre-existing vegetation will restored with native seed or species mix to restore habitat value
All other anticipated non-storm water management measures are covered under Job Site Management.	
Waste Management and Materials Pollution Control	
Temporary Concrete Washout Facilities	Specified vehicle washing areas to contain concrete waste materials for collection and disposal
All other anticipated waste management and materials pollution control measures are covered under Job Site Management.	
General measures covered under job site management includes: • spill prevention and control • materials management • stockpile management • waste management • hazardous waste management • contaminated soil • concrete waste • sanitary and septic waste and liquid waste • dust control	Non-storm water management consists of: • water control and conservation • illegal connection and discharge detection and reporting • vehicle and equipment cleaning - No discharge of pollutants are allowed into the storm drain or watercourses • vehicle and equipment fueling and maintenance areas must be at least 50 feet away from downslope drainage facilities and water courses, and must use drip pans or absorbent pans to prevent spill • On-site fueling or maintenance areas must be approved by Caltrans resident engineer • material and equipment used over water • structure removal over or adjacent to water • paving, sealing, saw cutting and grinding operations • thermoplastic striping and pavement markers • concrete curing and concrete finishing - concrete waste is collected and disposed of and not allowed into watercourses, and waste will be stored in previously disturbed areas; a minimum of 50 feet from waterways • dust control will be implemented, including the use of water trucks and tackifiers in excavation and fill areas, and rocking of temporary access roads entrances and exits

Temporary BMPs	Purpose
Miscellaneous job site management includes: • training of employees and subcontractors • proper selection, deployment and repair of construction site BMPs	

Note: The temporary BMPs identified in this table are generally pulled from *Caltrans Construction Site BMPs Manual;* and have been modified slightly to capture avoidance measures specific to the protection of the natural values of the waterways, and the special status species present within and adjacent to the project limits (see **Section 2.3, Biological Environment**).

Source: Caltrans, 2014p and Caltrans, 2014g

Permanent BMPs

The design features to address water quality impacts are a condition of Caltrans' NPDES permit, Construction General Permit, and other regulatory agency requirements. Implementation of details for these design features or BMPs would be developed and incorporated into the Build Alternative design prior to project construction. Implementation of the SWMP also requires that long-term pollution prevention and control measures be incorporated into the Build Alternative design.

Measure WQ-2: Design Pollution Prevention BMPs. The drainage and landscape elements listed below can be utilized as design pollution prevention BMPs for the Build Alternative, as specified by the Design Engineer. The following elements would be considered during the final design phase:

- *Consideration of downstream effects related to increased flow:* The Build Alternative would discharge into unlined ditches; therefore, necessary erosion control would be applied to the ditches to minimize erosion downstream from increased discharge.
- *Preservation of existing vegetation: Preserving existing vegetation is beneficial.* The Build Alternative would avoid any disturbance beyond what will be necessary to widen the existing transportation facilities.
- *Concentrated flow conveyance systems:* The Build Alternative has the potential to create water gullies, create and modify existing ditches, dikes, and berms, and require the concentration of surface flows. If necessary, flow attenuating devices would be implemented (e.g., flared-end-section, outlet protection/velocity dissipation devices).
- *Slope/Surface Protection Systems:* The Build Alternative would create or modify existing slopes. Necessary erosion control features would be incorporated for work along steep grades. When practicable, slope stability and erosion concerns would be reduced by maintaining or matching existing slopes.

- *Hydromodification:* In order to manage hydromodification, volume-reduction elements may be proposed during the design phase to match, or closely match, the pre- and post-construction hydrographs. Measures to address hydromodification impacts can include structural measures, such as underground detention, and non-structural measures, through the modification of proposed treatment BMPs (see below). The proposed measures must be designed to show that storm water runoff discharge rates and durations match the pre-project conditions within a certain percentage of the peak flow rates during storm events.

Measure WQ-3: Treatment BMPs. Typical permanent treatment BMPs may include infiltration device such as vegetated basins and/or swales along the roadways that collect storm water runoff. The basins allow pollutants to settle and filter out prior to the storm water entering the drainage systems. Caltrans has an approved list treatment BMPs that have been studied and verified to remove targeted design constituents and provide general pollutant removal. In addition, the San Francisco RWQCB suggests the use of both infiltration and retention devices for pollutant removal or reduction while promoting the effort to mimic predevelopment hydrology by reducing flow rates and velocity and allowing for groundwater recharge. Although retention devices are not currently approved Caltrans BMPs devices, the feasibility and determination of preferred treatment BMPs type would be coordinated to ensure both Caltrans and regional requirements are met. Existing treatment BMPs removed by the project must be replaced.

Phase 1 – Initial Construction Phase

All avoidance, minimization, and mitigation measures applicable to the Build Alternative would apply to Phase 1.

2.2.3 GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

REGULATORY SETTING

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under the California Environmental Quality Act (CEQA).

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Caltrans’ Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. Structures are designed using the Caltrans’ Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge’s category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Caltrans’ Division of Engineering Services, Office of Earthquake Engineering, and Seismic Design Criteria.

AFFECTED ENVIRONMENT

Information for this section is based on the Preliminary Geologic Assessment prepared for the project (Caltrans, 2014k). The geologic study area includes geologic features within which the Build Alternative improvements, including construction activities and staging areas, would be located. The geologic study area represents the physical extent of all Build Alternative improvements, including the Phase 1 segment.

Topography and Hydrogeology

The geologic study area is located in the Coast Ranges Geomorphic Province of northern California, characterized by northwest trending folds and intervening valley, and faults associated with the San Andreas Fault Zone. The geologic study area is parallel to the foothills of the Coast Ranges from State Route 237 (SR 237) to Mission Boulevard, where the elevation ranges between about 40 and 260 feet above mean sea level ("msl"). Northeast of Mission Boulevard, the study area crosses over Mission Pass at a peak elevation of about 645 feet above msl and then lowers into Sunol Valley at an elevation of about 250 feet above msl. From Sunol Valley, the elevation of the geologic study area begins to increase again up to about 350 feet above msl at the intersection with SR 84.

Alameda Creek is the largest surface water body that crosses the geologic study area in Sunol Valley. Surface water in Alameda Creek generally flows to the northwest toward San Francisco Bay. Several smaller creeks/channels cross the study area between Yosemite Drive and Mission Boulevard. These smaller creeks generally flow west toward San Francisco Bay.

Based on review of recent groundwater data located near the study area (Caltrans, 2014f), groundwater flow generally follows the local topography. As a result, the peak of Mission Pass appears to create a groundwater divide where groundwater east of the peak appears to flow northeast toward Alameda Creek and groundwater west of the peak appears to flow west and southwest toward San Francisco Bay. Within the geologic study area, depth to groundwater below ground surface varies between 5 and 50 feet, with the deepest groundwater levels observed between Scott Creek Road and South Grimmer Boulevard where the local surface elevation is higher.

Geology and Subsurface Conditions

No natural landmarks or other examples of major geologic features (such as scenic rock outcroppings) occur within the geologic study area. The geologic units encountered within the geologic study area can be grouped into three general categories: 1) Cretaceous deep-marine sedimentary rocks; 2) a sedimentary sequence of early to middle Miocene marine rocks; and 3) latest Tertiary through Holocene alluvial deposits. The study area is underlain by Holocene and Pleistocene alluvium and early Pleistocene or Pliocene sediments from SR 237 to Mission Boulevard and from Sunol Valley to SR 84 (see **Figure 2.2-1**). Travelling northeast across the Mission Pass, the geologic study area is underlain by Miocene sedimentary rocks and Cretaceous Great Valley complex sedimentary rocks.

Based on review of the U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS) soil survey data, approximately 20 different soil series intersect the geologic study area, which includes a total of 48 different soil types. The major soil components mapped within the geologic study area are primarily clay, loam, and urban land complexes.

Geologic Hazards

Geologic hazards include soil erosion, subsidence, expansive soils, and corrosive soils.

Soil Erosion

Erosion is the detachment and movement of soil material by natural processes, such as wind and water. The rate of soil erosion, which is dependent on the local landscape, climate, and soil properties, can be accelerated by human activities such as construction grading and excavation. Erosion from storm water run-off is the dominant natural erosion process in the project vicinity within the geologic study area. Long-term erosion impacts could include undercutting of roadways by uncontrolled storm water runoff and increased risks of landslides.

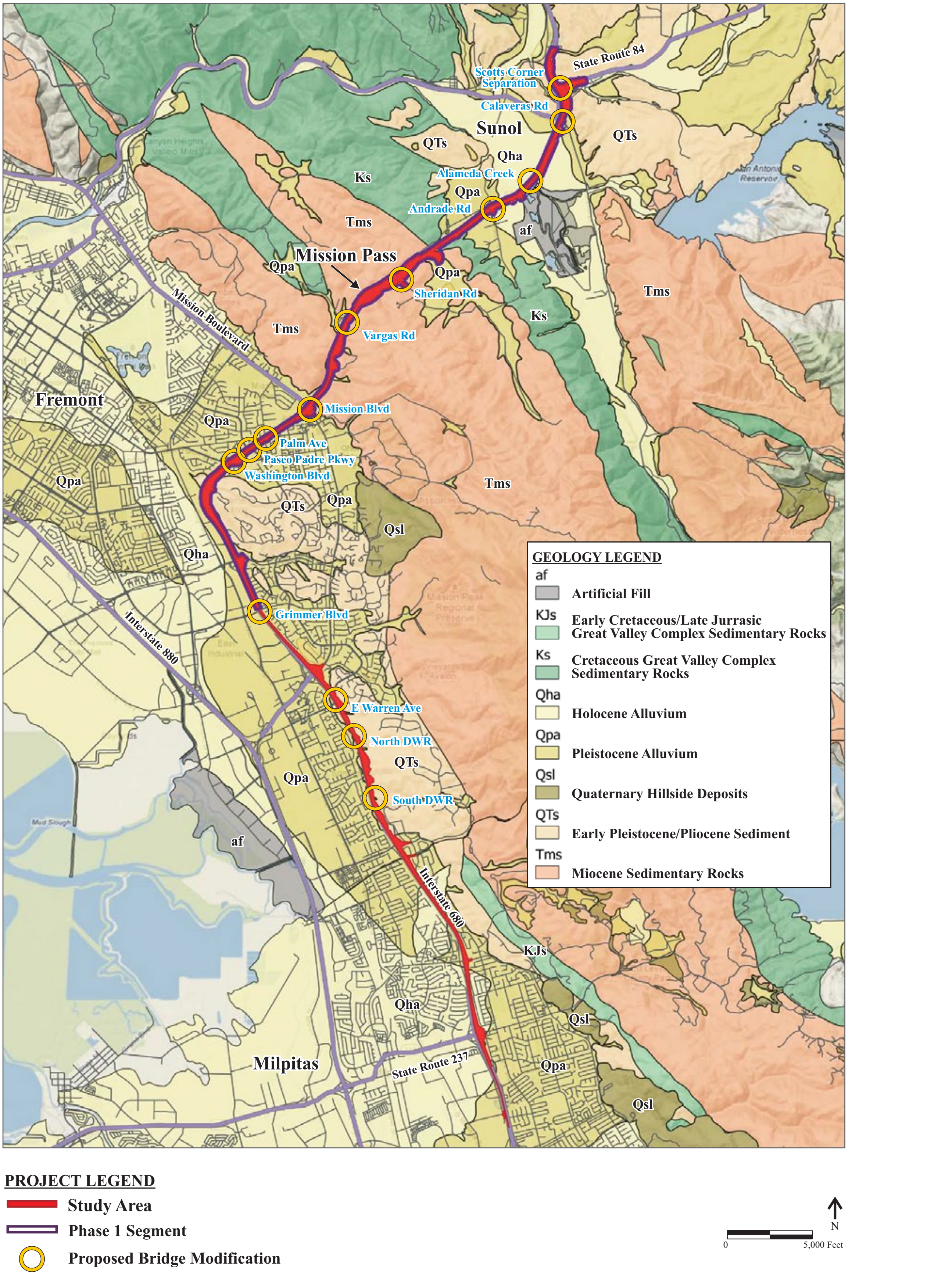
As shown in **Figure 2.2-2**, approximately 15 percent of the soils within the study area have a high susceptibility to water erosion. These soils are located in Sunol Valley, between Sheridan Road and SR 238 (Mission Boulevard), and near the proposed East Warren Avenue and North Department of Water Resources (DWR) bridge modifications. In addition, areas with steep slopes from about Scott Creek Road to East Warren Avenue, Auto Mall Parkway to Washington Boulevard, Mission Boulevard to Sheridan Road, and northeast of Sunol Valley are also likely susceptible to higher levels of erosion.

Subsidence

Subsidence is the settlement of organic soils and/or saturated mineral soils of low density following drainage. Subsidence could affect project structures (e.g., new pavement, retaining walls, and bridge foundations) due to uneven settling over time. As shown in **Figure 2.2-2**, soils susceptible to subsidence are located from about Yosemite Drive to Dixon Landing Road.

Expansive Soils

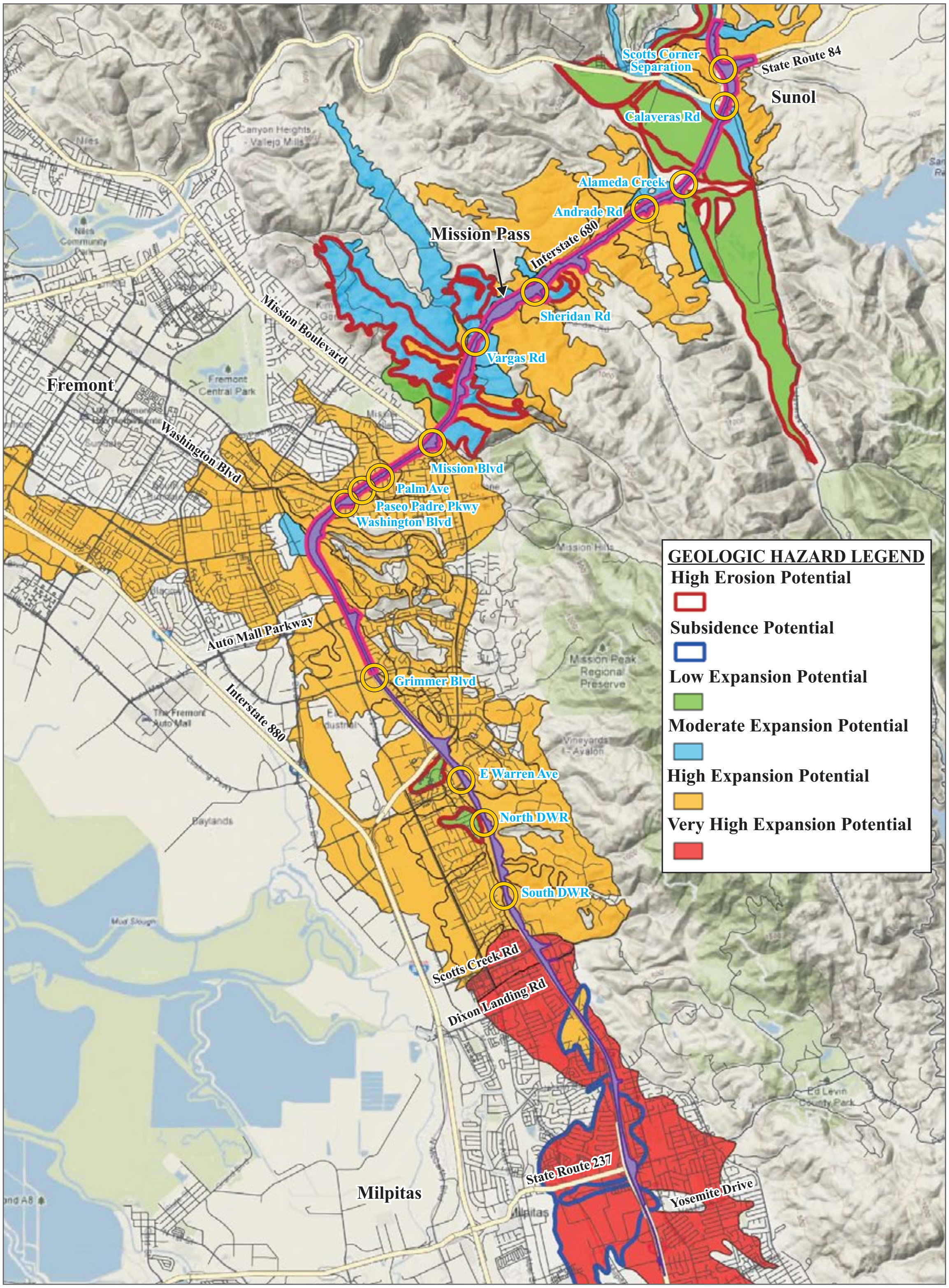
Expansive soils are characterized by the potential for shrinking and swelling as the moisture content of the soil decreases and increases, respectively. Expansive soils can cause damage to roads, underground utilities, and other structures if not properly treated. Shrink-swell potential is influenced by the amount and type of clay minerals present and can be measured as a percent change of the soil volume. **Figure 2.2-2** shows areas with low (<3 percent), moderate (3 to 6 percent), high (6 to 9 percent), and very high (>9 percent) expansion potential in the geologic study area. Approximately 95 percent of the soils in the geologic study area have estimated expansion potential greater than 3 percent.



Bedrock Geology

Figure **2.2-1**

Source: Caltrans, 2014k



PROJECT LEGEND

- Study Area
- Phase 1 Segment
- Proposed Bridge Modification

Notes

Erosion Potential based on K factors (the effects of steep slopes not shown).
Soil survey data included in Appendix A and geological hazards are summarized in Table 1.

Soil Erosion, Subsidence and Expansion Hazards

Figure **2.2-2**

Source: Caltrans, 2014k

Corrosive Soils

Uncoated subsurface steel and concrete structures are susceptible to corrosion based on the moisture content, texture, acidity, electrical conductivity, and sulfate and sodium content of soil. Corrosive soils can affect project structures (e.g., retaining walls and bridge foundations) and underground utilities containing steel that are not properly treated. Approximately 60 percent of the soils within the geologic study area have a high corrosion potential for uncoated steal.

Seismic Hazards

Seismic hazards include surface fault rupture, seismic shaking, liquefaction, and landslides.

Surface Fault Rupture

Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. The location of surface rupture generally occurs along an active fault trace. Areas susceptible to surface fault rupture are delineated by the California Geological Survey (CGS) Alquist-Priolo Earthquake Fault Zones and/or are located near fault traces. Damages from surface fault rupture could include displacement of pavement, rupture of underground utilities, and damage to bridge foundations.

Known and suspected traces of the Hayward and Calaveras Faults cross the project limits within the geologic study area several times. The Hayward Fault overlaps and crosses about 30 percent of the geologic study area and the Calaveras Fault crosses the northern terminus of the project limits. The Silver Creek Fault is approximately 2.8 miles west of the project limits in the geologic study area. The location of the fault traces at and in the vicinity of the geologic study area are shown on **Figure 2.2-3.**

Seismic Ground Shaking

Seismic ground shaking generally refers to all aspects of motion of the earth's surface resulting from an earthquake, and is normally the major cause of damage in seismic events. Seismic ground shaking could result in damage including the collapse of bridges, rupturing of underground pipelines, and cracking and distortion of pavement, walls, and foundations.

The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. The magnitude of a seismic event is assessed by seismographs that measure the amplitude of seismic waves. The Modified Mercalli Intensity scale (MMI) is the most commonly used scale to measure the subjective effects of earthquake intensity in values ranging from I to XII. Intensity can also be quantitatively measured using strong motion seismographs that record the peak ground acceleration (PGA) in terms of percent of acceleration force of gravity. Descriptions of the MMI scale and PGA equivalents are summarized in **Table 2.2.3-1**.

The intensity of ground shaking associated with the Hayward, Calaveras, and Silver Creek Faults are represented by PGAs and MMI values shown on **Figure 2.2-3**. The entire geologic study area is susceptible to intense ground shaking with an MMI value of IX or higher, which represents ground motion intensities that would cause considerable damage to structures in the event of an earthquake.

Liquefaction

Liquefaction is the temporary transformation of loose, saturated, granular sediments to a fluid like state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement such as lateral spreading. Liquefaction can affect project structures (e.g., new pavement, retaining walls, and bridge foundations), underground utilities, and traffic operations if these structures were not designed considering the existing hazards.

Table 2.2.3-1 Modified Mercalli Intensity Scale

MMI Scale	PGA (%g)	Potential Damage	Description of Ground Motion Intensity
I	<0.17	None	Not felt except by a very few under especially favorable circumstances.
II	0.17-1.4	None	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing
III	0.17-1.4	None	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	1.4-3.9	None	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	3.9-9.2	Very Light	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	9.2-18	Light	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight
VII	18-34	Moderate	Everybody runs outdoors. Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	34-65	Moderate/ Heavy	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
IX	65-124	Heavy	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.

MMI Scale	PGA (%g)	Potential Damage	Description of Ground Motion Intensity
X	>124	Very Heavy	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	>124	Very Heavy	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	>124	Very Heavy	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted.

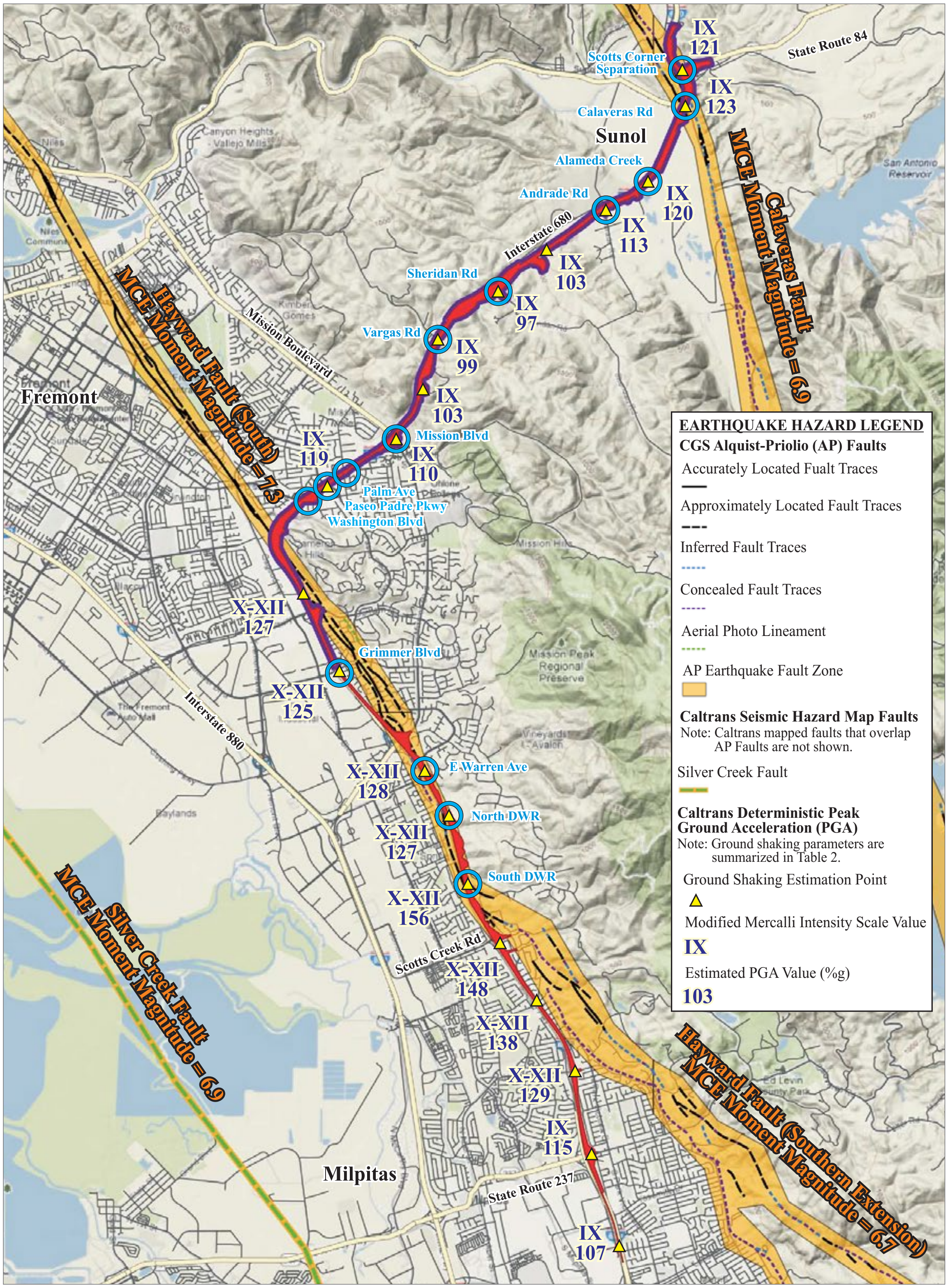
Notes:
MMI = Modified Mercalli Intensity
%g = percent of acceleration force of gravity
Source: Caltrans, 2014k

Liquefaction hazard levels within the geologic study area range from moderately low to high, as shown in **Figure 2.2-4**. In general, the areas south of SR 238 (Mission Boulevard) are ranked as having a high liquefaction hazard level and require additional investigation to determine the extent and magnitude of potential ground failure. The areas between Andrade Road and SR 84 are ranked as having a moderately low to moderate liquefaction hazard level.

Landslides

Landslides can occur as either rapid movement of large masses of soil or imperceptibly slow movement of soils on slopes. The primary factors influencing the stability of a slope are the nature of the underlying soil or bedrock and the geometry of the slope (height and steepness). Landslides are generally triggered by rainfall, excavation, or seismic activities.

As shown on **Figure 2.2-4**, the geological study area includes three CGS Seismic Hazards Zones requiring further investigation for landslides from about Scott Creek Road to East Warren Avenue, Auto Mall Parkway to Washington Boulevard, and SR 238 (Mission Boulevard) to Sheridan Road. Previous landslides within the geologic study area have been documented by Caltrans between 1978 and 1997. These landslides occurred adjacent to the northbound I-680 corridor, between Scott Creek Road and East Warren Avenue, and are within the CGS Seismic Hazard Zones for landslides shown in **Figure 2.2-4**. Seismic Hazard Zones have not been evaluated near the intersection of SR 84; however, since soils near the intersection of SR 84 have previously been disturbed by landslides, additional investigation should be performed to determine the potential for future landslides.



PROJECT LEGEND

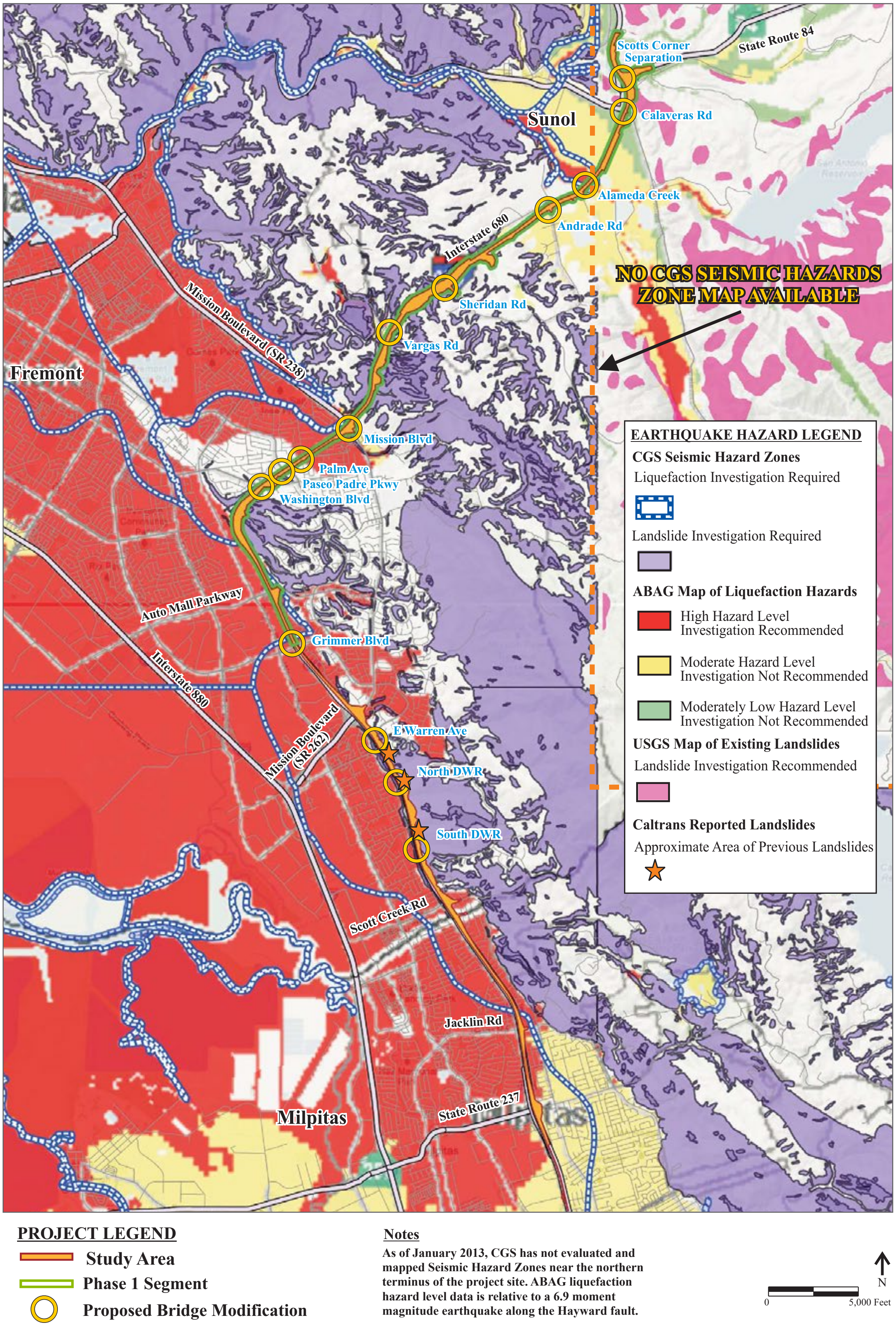
- Study Area
- Phase 1 Segment
- Proposed Bridge Modification

Notes

CGS = California Geological Survey
MCE = Maximum Credible Earthquake
Modified Mercalli Intensity values range from I to XII.
PGA values estimated using Caltrans ARS Online (V2.0.4), based on Maximum Credible Earthquakes at nearby faults and an average shear wave velocity of 760 meters per second.

Seismic Hazards — Figure **2.2-3**

Source: Caltrans, 2014k



Liquefaction and Landslide Hazards

Figure 2.2-4

Source: Caltrans, 2014k

Mineral Resources

In compliance with the Surface Mining and Reclamation Act, the State Mining and Geology Board has designated mineral resources in areas within California subject to irreversible land uses that would preclude mineral extraction. Land has been classified by the State Geologist into Mineral Resource Zones ("MRZs") based on geologic and economic factors. Mineral Resource Zones include classification for construction materials, industrial and chemical mineral materials, metallic and rare minerals, and non-fluid mineral fuels. The mapping of MRZs is intended to help identify and preserve "significant mineral deposits", as mandated by the Surface Mining and Reclamation Act. Mineral Resource Zones are defined as follows:

- MRZ-1 = Areas where adequate information indicates that no significant mineral deposits are present, or it is judged that little likelihood exists for their presence
- MRZ-2 = Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence
- MRZ-3 = Areas containing known or inferred mineral deposits of which the significance is undetermined based on available data
- MRZ-4 = Areas where available information is inadequate for assignment to any other MRZ zone

Based on the Mineral Land Classification Maps published by the state of California, the geological study area crosses all four types of MRZs. Mineral resources reported in the vicinity of the geologic study area include sand, gravel, stone, and manganese. The locations of MRZs and mineral resource sites are shown on **Figure 2.2-5**.

No oil, gas, or geothermal wells were mapped on or adjacent to the geologic study area.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Temporary Construction Related Effects

Construction activities, such as grading and excavation, could adversely affect the stability of existing soils and increase the overall potential for soil erosion. Road cuts that increase natural slopes can also increase the rate of soil erosion. During construction, erosion could cause sedimentation problems in storm drains, remove top soils, create deeply incised gullies on slopes, and undermine engineered fills beneath foundations or roadways.

Construction workers could be exposed to seismic hazards during installation of the proposed improvements since the Build Alternative is located in a seismically active region.

Permanent Operations Related Effects

The Build Alternative is located in a geologically hazardous and seismically active region. Without proper engineering, improvements could pose safety issues to people and structures as a result of soil erosion, subsidence, expansive soils, corrosive soils, surface fault rupture, seismic shaking, liquefaction, and landslides.

Mineral Resources

As shown on **Figure 2.2-5**, there are three areas classified as MRZ-2 with known or suspected "significant mineral deposits". These areas have either formerly or are currently being mined for manganese, sand, and gravel. The significance of mineral deposits in the geologic study area classified as MRZ-3 and MRZ-4 are undetermined. Since the Build Alternative would be predominantly located within the existing right-of-way, proposed improvements would not substantially intrude on the current mining operations or the potential availability of local and statewide valuable minerals. Therefore, the Build Alternative would have no effect on existing or potential mineral resources.

Phase 1 -Initial Construction Phase

The risks associated with the local geology and seismic conditions described above for the Build Alternative are applicable to Phase 1. **Figure 2.2-3** through **Figure 2.2-5** illustrates the geologic and seismic hazards in relation to Phase 1. There are no conditions or risks specific to Phase 1 that would change the conclusions of the environmental consequences previously identified.

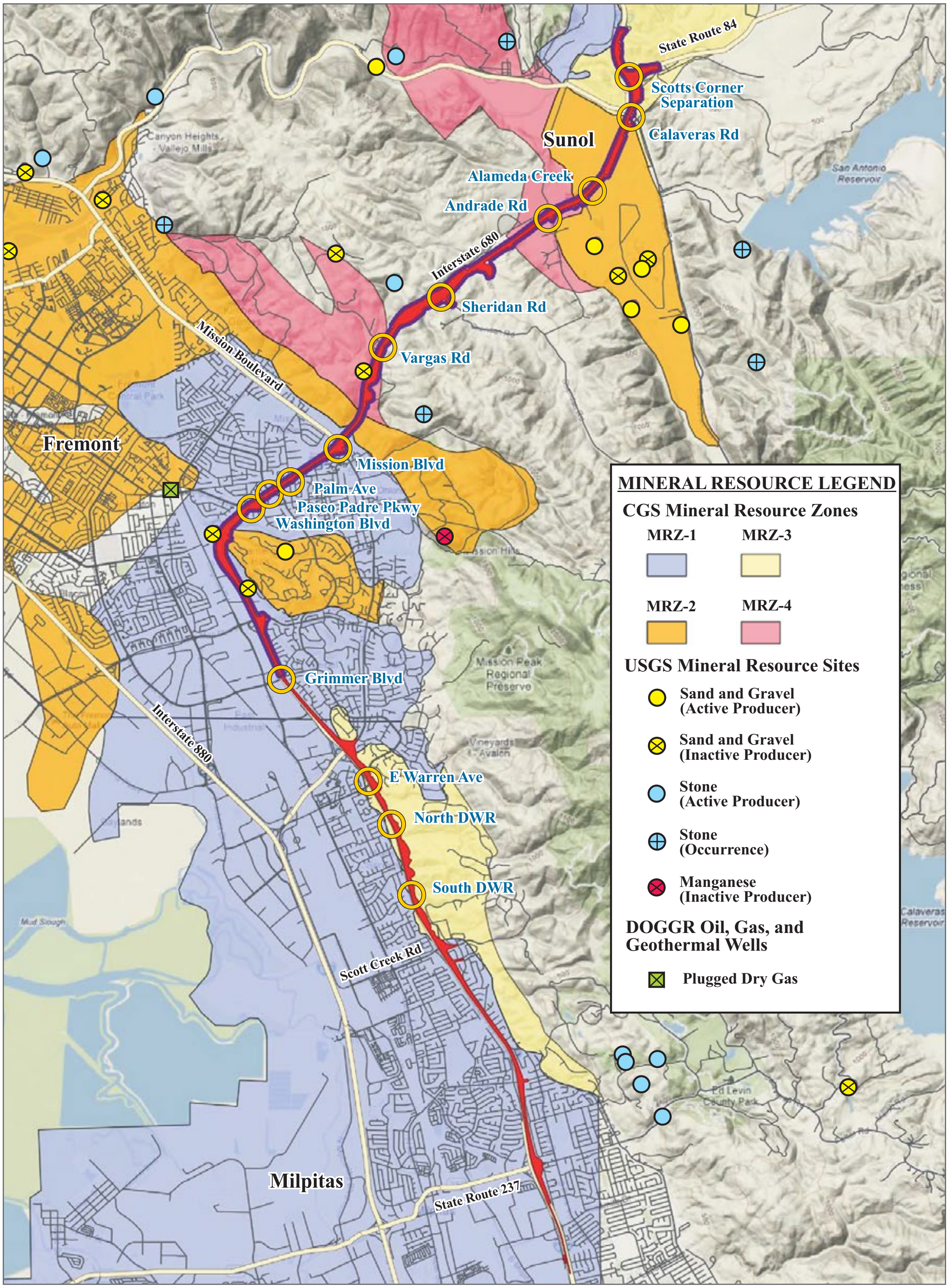
No-Build Alternative

Under the No-Build Alternative, the freeway travel lanes along northbound I-680 would remain as they currently exist. No bridge structures would be widened or replaced. Implementation of other planned and approved projects would be subject to the same seismic and geologic hazards as the Build Alternative, since they would occur in the same seismically active region. These projects would be required to comply with Caltrans' standard design and construction guidelines and Occupational Safety and Health Administration (OSHA) requirements regarding seismic and geologic hazards, which would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/ OR MITIGATION MEASURES

Build Alternative

Under the Build Alternative, any new or modified structures would be constructed in compliance with Caltrans' seismic design standards and construction guidelines. No avoidance, minimization, or mitigation measures would be required beyond the implementation of the Caltrans' standard specifications.



PROJECT LEGEND

Study Area

Phase 1 Segment

Proposed Bridge Modification

Notes

CGS = California Geological Survey
USGS = United States Geological Survey
DOGGR = Division of Oil, Gas & Geothermal Resources (California Department of Conservation)

N

0 5,000 Feet

Mineral Resources

Figure **2.2-5**

Source: Caltrans, 2014k

As described in **Section 2.2.2, Water Quality and Storm Water Runoff**, **Measure WQ-1**, erosion control measures would be implemented during construction activities in accordance with the best management practices outlined in the SWPPP. Protective measures would reduce soil erosion and minimize impacts to water quality, including groundwater.

Measure GEO-1: As part of the final design phase, Caltrans requires preparation of the geotechnical design reports that incorporate the results of additional subsurface field work and laboratory testing. Site specific subsurface soil conditions, slope stabilities, and groundwater conditions within the Build Alternative area would be verified during the preparation of these geotechnical design reports. The identification of the site specific soil conditions within the project limits would be used to determine the appropriate final design for the foundations and footings that would support the proposed Build Alternative improvements.

Caltrans' standard design and construction guidelines incorporate engineering standards that address seismic risks. Proposed structures including, retaining walls, soundwalls, and embankments constructed within the geologic study area would consider seismically-induced liquefaction and settlement during the final design phase.

The final design phase would also include the evaluation of the Design Response Spectrum, which measures the ground motion or acceleration caused by the input of a vibration from an earthquake at a specific location and can help understand how structures would respond to earthquakes in a given place.

Measure GEO-2: With respect to worker safety during construction, OSHA requires employers to comply with hazard-specific safety and health standards. Pursuant to Section 5(a) (1) of Occupational Health and Safety Administration (OSHA), employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Seismic-related hazards to workers during construction are expected to be less than substantial with compliance with the OSHA and compliance with Caltrans' standard design and construction guidelines.

Phase 1–Initial Construction Phase

Caltrans' standard design and construction guidelines are applicable to the entire Build Alternative alignment, including Phase 1. No avoidance, minimization, or mitigation measures would be required beyond the implementation of the Caltrans' standard specifications.

2.2.4 PALEONTOLOGY

REGULATORY SETTING

Paleontology is the study of prehistoric life based primarily on the study of fossil plants and animals. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects (e.g., Antiquities Act of 1906 [16 USC 431-433], Federal-Aid Highway Act of 1960 [23 USC 305]). The Antiquities Act prohibits appropriating, excavating, injuring, or destroying any object of antiquity situated on federal land without the permission of the Secretary of the Department of Government having jurisdiction over the land. Fossils are considered "objects of antiquity" by the Bureau of Land Management, the National Park Service, the Forest Service, and other federal agencies. Federal-Aid Highway Act of 1960 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with the Antiquities Act above and state law. In addition, 23 United States Code (USC) 1.9(a) requires that the use of federal-aid funds must be in conformity with federal and state law.

Under California law, paleontological resources are protected by CEQA.

AFFECTED ENVIRONMENT

Paleontological information for this section is based on the Paleontological Identification and Evaluation Report, prepared for the project (Caltrans, 2014j). The geological study area defined in **Section 2.2.3, Geology/Soils/Seismic/Topography**, is used in this evaluation of potential sensitivities for paleontological resources (i.e., vertebrate, invertebrate, and plant fossils), and includes those geologic units within which the Build Alternative improvements would be located, including Phase 1 segment.

As discussed in **Section 2.2.3**, **Geology/Soils/Seismic/Topography,** the geologic units encountered along the proposed project alignment can be grouped into three general categories: 1) Cretaceous deep-marine sedimentary rocks deposited within a fore-arc basin (Panoche formation); overlain by 2) a sedimentary sequence of early to middle Miocene marine rocks; and 3) Pliocene to Holocene alluvial deposits.

The following discussions describe the paleontological sensitivities for the study area. **Table 2.2.4-1** presents a summary of the geologic units within the study area, and their respective paleontological sensitivities. The distribution of these units is illustrated in **Figure 2.2-6(a-c).**

Table 2.2.4-1 Paleontological Sensitivity of Geological Units in the Project Limits

Map Symbol	Age	Formation	Lithology	Known Paleontological Resources	Paleontological Sensitivity
Qha	Holocene	Quaternary Younger Alluvium	Mostly alluvial sands and gravels, coarser in channel deposits	No significant resources	Low
Qpa	Late Pleistocene to early Holocene	Quaternary Older Alluvium	Sands and gravels	Vertebrates,	High
Qts	Pleistocene	Irvington Gravel	Sands, gravels, and clays	Vertebrates,	High
		Livermore Gravel			

Map Symbol	Age	Formation	Lithology	Known Paleontological Resources	Paleontological Sensitivity
Tms	Miocene	Briones Formation	Siltstones, sandstones, shell-hash conglomerates	Vertebrates, invertebrates	High
		Tice Shale	Siliceous to semi-siliceous shale	Vertebrates, invertebrates, microfossils	
		Hambre Sand	Massive sandstones	Vertebrates, invertebrates	
		Claremont Formation	Thinly bedded, siliceous shale	Vertebrates, invertebrates	
KJs, Ks	Cretaceous	Panoche Formation	Massive sandstones	Invertebrates, plants, rare vertebrates	High

Source: Caltrans, 2014j

If a paleontological resource cannot be avoided, then it is necessary to determine its significance or scientific importance before any mitigation measures are proposed. This may be stated for a particular fossil species, fossil assemblage, or for a rock unit as a whole. Definitions of a scientifically significant paleontological resource can vary by jurisdictional agency and paleontological practitioner. Generally, scientifically significant paleontological resources are identified sites or geologic deposits containing individual fossils or assemblages of fossils that are unique or unusual, diagnostically or stratigraphically important, and add to the existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally. Particularly important are fossils found *in situ* (undisturbed) in primary context (e.g., fossils that have not been subjected to disturbance subsequent to their burial and fossilization).[2]

Cretaceous marine sediments of the Panoche Formation

The oldest sediments are the Cretaceous marine sediments of the Panoche Formation. This unit consists of the interbedded sandstones and mudstones, typical of turbidities. Both clay and mudstones as well as light brown to grey arkosic sandstones are present within the geological study area. The Panoche Formation outcrops at the surface towards the northern end of Mission Pass. While no fossil localities have been reported from within the geological study area, the Panoche Formation has produced marine fossils elsewhere, often in concretions.[3]

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[2] Caltrans Standard Environmental Reference, Volume 1, Chapter 8, Paleontology (see *Definitions of Significance and Sensitivity*). Available: http://www.dot.ca.gov/ser/vol1/sec3/physical/Ch08Paleo/chap08paleo.htm#per; Last Accessed: April 11, 2014.

[3] A concretion is a hard, compact, often spherical, mass of sedimentary rock formed by the precipitation of mineral cement within the spaces between the sediment grains.

Early to middle Miocene marine rocks

The early Miocene marine sediments have been subdivided into three different stratigraphic units. These units are, in order from oldest to youngest, the Claremont Shale, Hambre Sand, and the Tice Shale. These units are tightly folded into the Diablo Ranges, and exist on either side of the I-680 corridor, between Mission Boulevard and Sheridan Road. Miocene marine sediments, such as the deposits found within the geologic study area, have produced an extremely diverse and important assemblage of fossils, including invertebrates, fish, and marine mammals. In the project region, these units have produced significant fossil findings, with the Claremont Shale being the most fossilferous.

The Miocene marine sediments are in turn overlain by another marine unit, the middle Miocene Briones Formation. The Briones Sandstone consists primarily of white sandstones and siltstones but shales, conglomeratic sandstones, and shell-hashes may also occur. The Briones forms the top of ridges overlooking the southwestern and eastern side of Mission Pass in the project vicinity. This unit outcrops near the I-680 alignment at the southern end of Mission Pass. These outcrops consist primarily of white, moderately- to well-indurated sandstones. The Briones Formation has produced abundant and significant fossils both in the project region and elsewhere. Fossils found include invertebrates, fish, and a semi-aquatic mammal.

Pliocene through Holocene alluvial deposits

The Pliocene to Holocene alluvial deposits are primarily sands and gravels overlying the older units to the south and north of Mission Pass. These deposits have been referred to as the Livermore Gravel to the north of the pass and the Irvington Gravel and Quaternary (Pleistocene) Older Alluvium to the south. The Livermore Gravel and Irvington Gravel are very fossiliferous. The Quaternary Older Alluvium has also produced a rich assortment of vertebrate remains both in the vicinity of the geologic study area and in the greater region.

Quaternary Younger Alluvium, of Holocene age, occurs as a thin veneer over older sediments in low-lying areas in the Cameron Hills and Mission Pass areas, but is much thicker on the valley floors at either end of the project limits. The area between the I-680/SR 237 interchange and south of Scott Creek Road is primarily covered by relatively young alluvial and bay deposits, less than 10,000 years old. The Quaternary Younger Alluvium is too young, and is not known to have produced significant fossils. Furthermore this unit is already disturbed within much of the I-680 corridor.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The Build Alternative includes a wide range of construction activities. However, only those that could affect significant paleontological resources, typically through excavation or earth-moving, are of concern. For this project, activities that could adversely affect paleontological resources could include:

- Excavation and earth moving associated with widening of existing paved surfaces, construction of new auxiliary lanes and on- and off-ramps within the existing I-680 right-of-way reaching depths below any artificial fill and/or disturbed material
- Construction of retaining walls below the depth of artificial fill or disturbed material or outside the existing I-680 right-of-way
- The installation of sign/light poles that reach depths below the artificial fill and/or disturbed material
- Earth-moving and/or ground disturbance associated with the construction activities such as any needed to create a staging area for the widening of the Alameda Creek Bridge
- Earth-moving and/or ground disturbance associated with modifying overcrossing and undercrossing structures to accommodate freeway widening
- Demolition and replacement of the Sheridan Road overcrossing

The Panoche Formation, Claremont Shale, Hambre Sandstone, Tice Shale, Briones Sandstone, Livermore Gravel, Irvington Gravel, and Quaternary Older Alluvium are geologic units with a high sensitivity for producing paleontological resources. The likelihood of encountering paleontological resources is higher in deeper excavations. However, paleontological resources could also be encountered at shallower depth, if improvements are occurring in areas where sensitive units crop out at or near the surface.

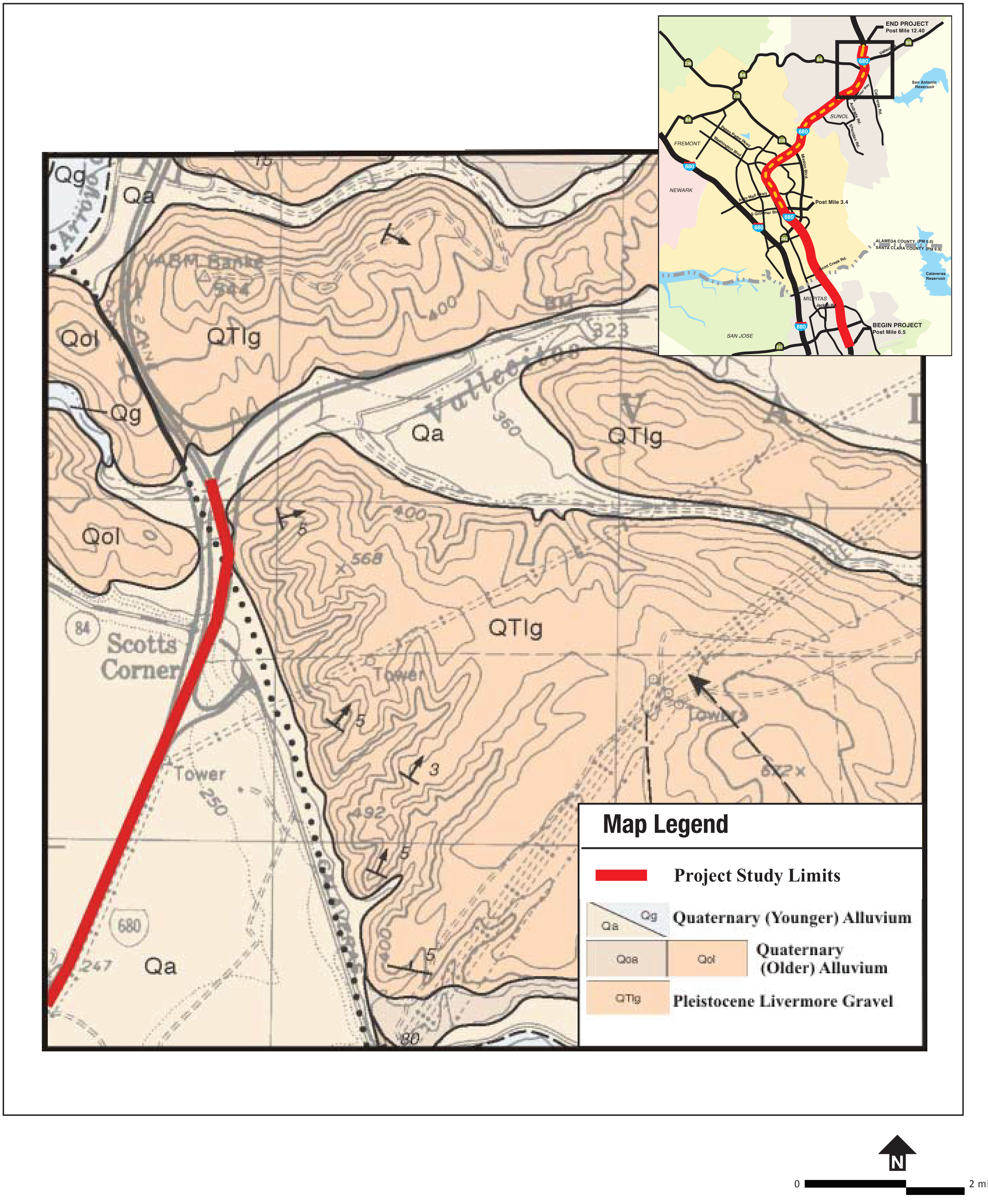
The Quaternary Younger Alluvium is too young to contain fossils and is disturbed throughout much of its extent. However, it is underlain by older fossiliferous geologic units at unknown depths that may be encountered depending upon the vertical extent of ground disturbance. As a result, areas with Quaternary Younger Alluvium at the surface are considered to have a low paleontological sensitivity rather than no sensitivity.

Under the Build Alternative, construction occurring south of the I-680/Auto Mall Parkway interchange would impact sediment deposits (younger alluvium) at the surface. This unit was previously disturbed with the construction of the existing I-680 freeway facility and has a low potential for paleontological resources.

Phase 1– Initial Construction Phase

The risks associated with the local geology and paleontological sensitivities described above for the Build Alternative are applicable to the Phase 1 segment. **Figure 2.2-6 (a-c)** illustrates the geologic units in relation to the Phase 1 Segment.

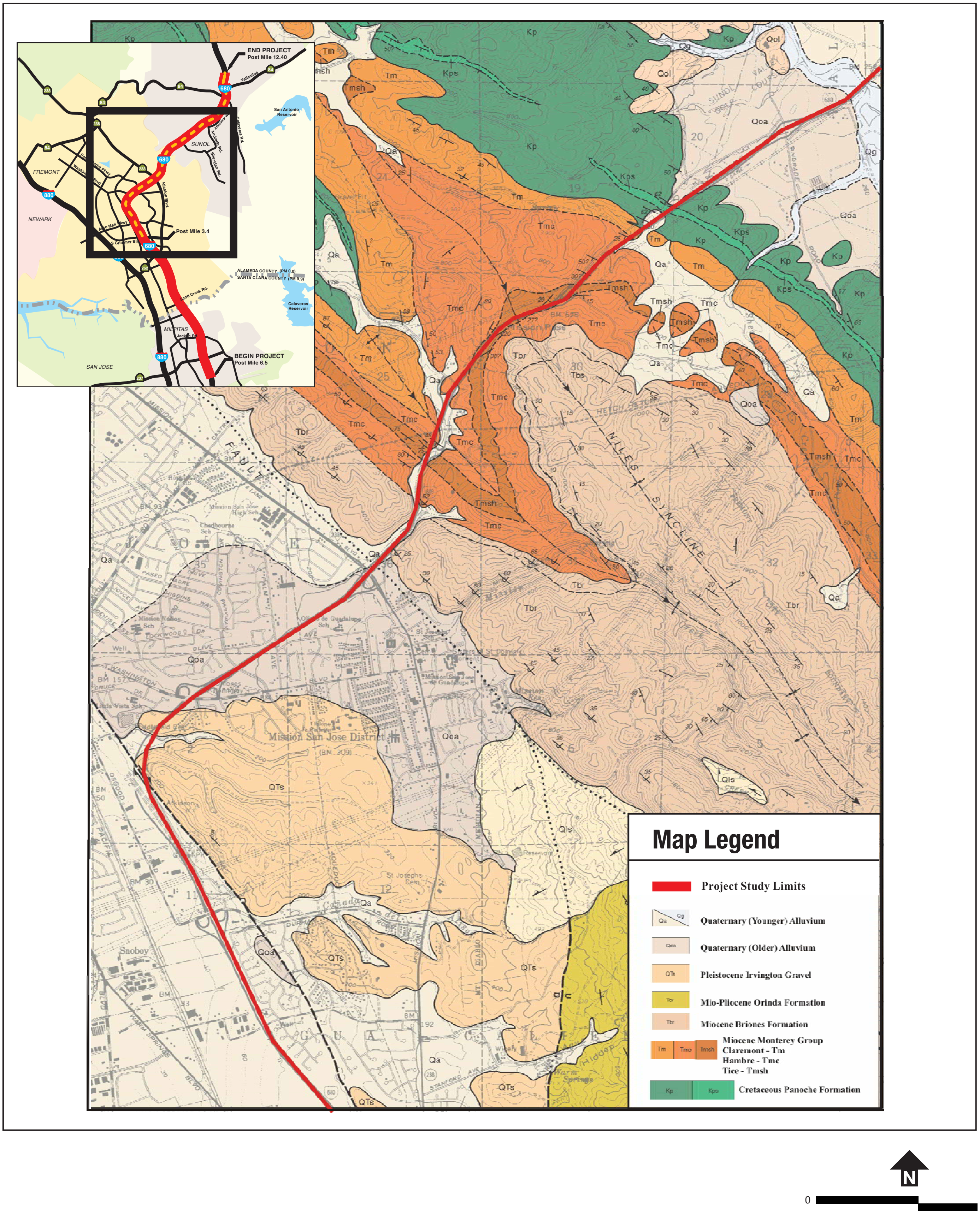
Phase 1 excavation activities would likely encounter geologic units with a high potential for paleontological resources. The approximate locations where this is most likely to occur include:



Geologic Map (Sheet 1 of 3)

Figure 2.2-6a

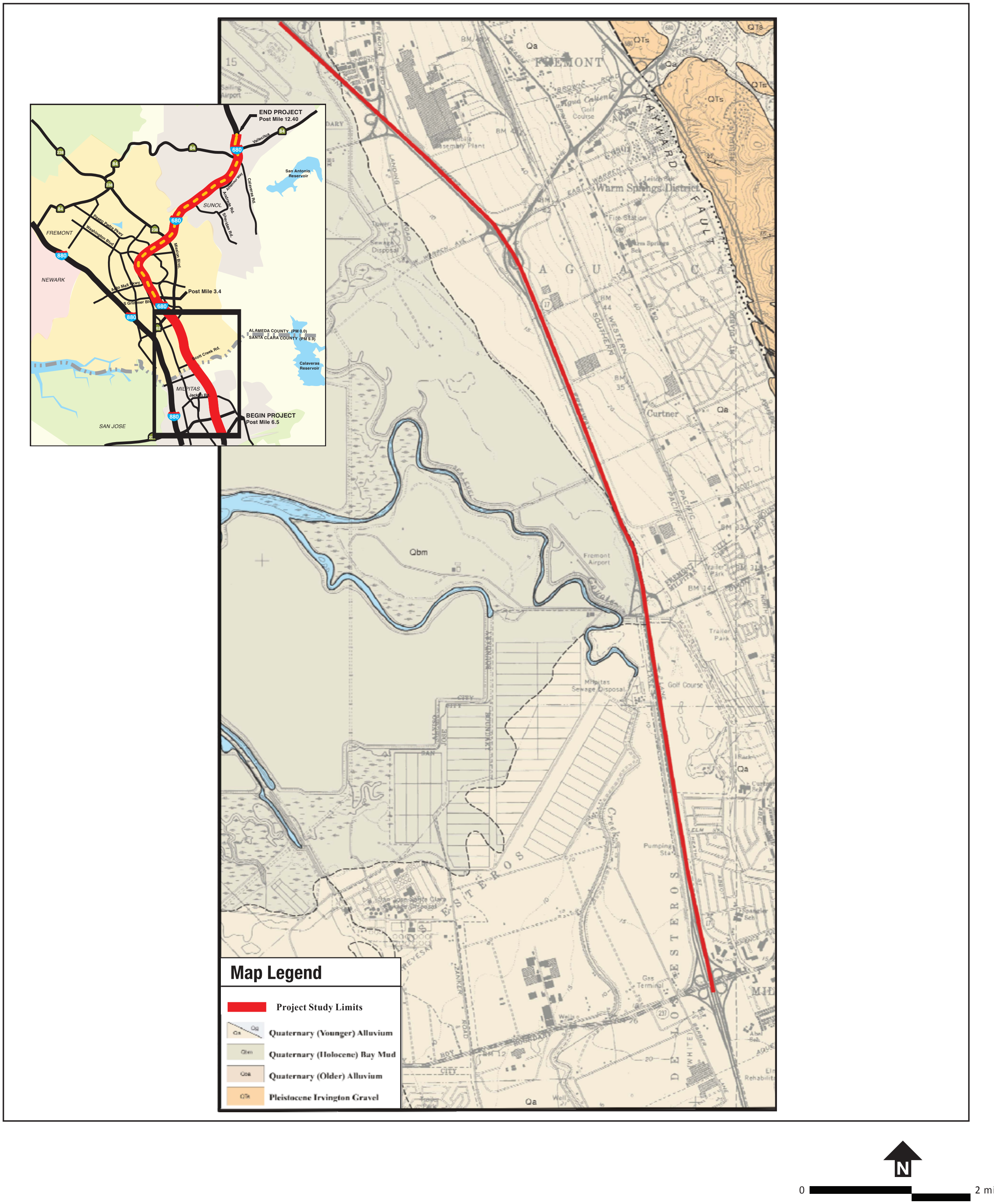
Source: Caltrans, 2014k; Circlepoint, 2014; Diblee and Minch, 2005



Geologic Map (Sheet 2 of 3)

Figure 2.2-6b

Source: Caltrans, 2014k; Circlepoint, 2014; Diblee and Minch, 2005



Geologic Map (Sheet 3 of 3)

Figure 2.2-6c

Source: Caltrans, 2014k; Circlepoint, 2014; Diblee and Minch, 2005

1. Toward the northern end of Mission Pass where the Cretaceous Age Panoche Formation and the Miocene age Claremont Formation, Hambre Sand, Tice Shale, and Briones Formation outcrop at the surface or at depth below the Holocene alluvium

2. In the Cameron Hills between the intersection of SR 238 (Mission Boulevard) and I-680 and where Sabercat Road parallels I-680 and between the northern end of Mission Pass and the southern end of the Alameda Creek Bridge, where Pleistocene sediments of the Livermore Gravel and Older Alluvial Deposits can be encountered at the surface

3. The northern most end of the project limits where Livermore Gravel could possibly be encountered at depth

No-Build Alternative

The No-Build Alternative assumes that the freeway travel lanes along northbound I-680 would remain as they currently exist. No bridge structures would be widened or replaced. Implementation of the other planned and approved projects in the vicinity would be subject to the same paleontological sensitivities as the Build Alternative, since they would occur in the same geologic region. These projects would be required to comply with Caltrans' standard design and construction guidelines regarding paleontological resources, which would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/ OR MITIGATION MEASURES

Build Alternative

Mitigation Measure PAL-A: Monitoring and Mitigation Program. Prior to construction, a qualified professional paleontologist (as defined by Caltrans SER) would be retained to both design a monitoring and mitigation program, and implement the program during project-related excavation and earth disturbance activities. The paleontological resource monitoring and mitigation program would include:

- preconstruction coordination
- construction monitoring
- emergency discovery procedures
- sampling and data recovery, if needed
- preparation, identification, and analysis of the significance of fossil specimens salvaged, if any
- museum storage of any specimens and data recovered
- reporting

Prior to the start of construction, the professional paleontologist would conduct a field survey of exposures of sensitive stratigraphic units within the construction footprint that would be disturbed. Earth-moving construction activities would be monitored and inspected for the presence of potentially fossiliferous sediments. Ground disturbance and earth-moving activities will only require paleontological mitigation if they will impact a geologic unit of high potential to produce significant fossils either because that unit occurs at the surface or excavation could encounter it at depth. Activities that occur solely within the Quaternary (younger) alluvium with low potential to produce significant fossils and solely within previously disturbed material underlying the I-680 right-of-way, would not require mitigation. Monitoring would not need to be conducted in sediments that have been previously disturbed or in areas where exposed sediments would be buried, but not otherwise disturbed.

Prior to the start of construction, construction personnel involved with earth-moving activities would be informed that fossils could be discovered during excavating, that these fossils are protected by laws, on the appearance of common fossils, and on proper notification procedures should fossils be discovered. This worker training would be prepared and presented by a qualified professional paleontologist.

Phase 1–Initial Construction Phase

Mitigation Measure PAL-A is applicable to Phase 1. No avoidance, minimization, or mitigation measures specific to Phase 1 would be required beyond the implementation of the Monitoring and Mitigation Program outlined above.

2.2.5 HAZARDOUS WASTE/MATERIALS

REGULATORY SETTING

Hazardous materials including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage, and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act

- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

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

California regulates hazardous materials, waste, and substances under the authority of the California 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 of 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 encountered, disturbed during, or generated during project construction.

AFFECTED ENVIRONMENT

The analysis summarized in this section is based on an Initial Site Assessment (ISA) prepared for the project (Caltrans, 2014e). The analysis focuses on determining whether health risks related to hazardous materials are present within the physical extent of all Build Alternative improvements, including construction activities and staging areas.

The ISA included an environmental regulatory database search, which identifies known hazardous waste sites that could negatively impact the project. A regulatory agency files review of selected sites of concern, a review of historical and current land use information, and two site reconnaissance surveys were also conducted as part of the ISA. The ISA was prepared in accordance with ASTM E1527 05 and the Caltrans' Project Development Procedures Manual and Standard Environmental Reference.

Data sources related to historical land uses, current land uses, and environmental records from regulatory agencies were reviewed to identify known or potential sites associated with hazardous materials within 1 mile of the project limits. These sites were then evaluated to identify known or potential releases of hazardous materials that could impact soils and/or groundwater beneath the physical footprint of the proposed Build Alternative. Following the review of data sources and evaluation of hazardous materials release sites, each site was assigned a level of risk related to the impacts to the project.

The limits of the ISA database searches and surveys were determined by using the footprint of proposed Build Alternative construction activities, which is not a single contiguous commercial parcel, as assumed in ASTM E1527-05. Interviews with past, present, and prospective owners or operators likely to have material information regarding the potential for contamination beneath the proposed improvements were not conducted because such persons could not be identified. Interviews with state or local government officials were not conducted, because any information obtained would likely duplicate information already reviewed from federal, state, and local regulatory agency records.

The ISA was limited to identifying sites that may impact the project limits, but the extent of the impact was not determined. The ISA did not identify whether the work area contains contamination that may affect the project, or the extent of any known or suspected contamination that may be present. Site specific investigations would be required for the potential contaminants of concern to be fully evaluated and quantified. See measures **HAZ-1**through **HAZ-5**.

Summary of Findings

The ISA identified several hazardous material release sites and former land uses that have contaminated soils and/or groundwater that may be encountered during project construction. Disturbance of contaminated media during construction could adversely impact human health and the environment. These locations, along with other environmental concerns associated with the I-680 corridor, are discussed in greater detail below, as they relate to the environmental consequences of the proposed project.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Hazardous Material Release Sites

The review of environmental records identified 104 sites with reported releases of hazardous materials within 1 mile of the proposed Build Alternative. Hazardous materials release sites that could potentially result in a risk to the project by affecting the chemical quality of soil and/or groundwater beneath the project limits were identified by one of more of the following screening criteria.

1. The release site is located on or immediately upgradient and adjacent to the project limits.
2. The release site is located hydraulically upgradient of the project limits and is under active regulatory oversight.

Criterion 1 includes release sites that are under active regulatory oversight or have been closed. While closed release sites do not require further regulatory actions for cleanup, land use restrictions could be recorded on the properties and/or residual contamination (if any) could adversely impact future land uses on and/or immediately adjacent to the property. The migration of residual groundwater contamination from a closed release site (if any) is generally limited and would not be expected to extend beyond the adjacent downgradient properties. Criterion 2 only includes active release sites, which generally pose a greater risk of groundwater contamination migrating beneath the project limits from sources up to 1 mile upgradient of the project.

Based on the screening criteria, 14 of the 104 hazardous materials release sites were identified as sites of concern. Based on review of previous investigations, the ISA determined that contamination from 11 of the 14 sites of concern would not likely impact groundwater beneath the proposed Build Alternative improvements. Groundwater contaminant plumes from 3 of the 14 sites could have impacted groundwater beneath the proposed Build Alternative improvements. These sites are shown on **Figure 2.2-7**, and described in **Table 2.2.5-1**. The site numbering in **Figure 2.2-7** corresponds to the site number identified in **Table 2.2.5-1**.

In addition to the known hazardous materials release sites, the following potential hazardous materials release sites could have impacted soil and/or groundwater beneath the proposed Build Alternative improvements: 15 former agricultural buildings, 4 former commercial/industrial buildings, 2 former gas stations, and 8 drycleaner sites located hydrologically upgradient or cross gradient from the I-680 corridor (see **Figure 2.2-7** and **Figure 2.2-8**). These are potential hazardous materials release sites because they are common sources of subsurface contamination, but have not yet been evaluated.

The ISA identified 29 sites that use, store, handle, and/or dispose of hazardous material adjacent to the Build Alternative; however, no releases have been reported at these sites, and no evidence of any existing hazardous materials release or material threat of a release was observed during the site reconnaissance.

Table 2.2.5-1 Hazardous Materials Release Sites of Concern

Site No.	Site Name and Location	Summary of Potential Impacts
21	Quik Stop #98, 1848 Washington Blvd	Groundwater impacted by a release of gasoline from an underground storage tank (UST). Based on groundwater monitoring activities, the gasoline plume has migrated beneath the proposed Build Alternative improvements. Excavations near the Quick Stop #98 that exceed 20 feet in depth could encounter groundwater impacted by the gasoline plume. The primary contaminants of concern are Methyl Tertiary Butyl Ether (MTBE) and Tertiary Butyl Alcohol (TBA).
86	Unocal #5130, 27 S Park Victoria Dr	Groundwater impacted by a release of gasoline from USTs. The edge of the gasoline plume has not been well defined and could have migrated beneath the proposed Build Alternative improvements. The primary contaminant of concern is TBA. Excavations in excess of 15 feet near this site could encounter impacted groundwater.

Site No.	Site Name and Location	Summary of Potential Impacts
E91	Parktown 1-Hour Martinizing, 1350 S Park Victoria Dr	Groundwater impacted by a release of chlorinated solvents. The edge of the chlorinated solvent plume has not been well defined and could have migrated beneath the proposed Build Alternative improvements. Excavations in excess of 20 feet near this site could encounter groundwater impacted by chlorinated solvents. The primary contaminant of concern is tetrachloroethylene.

Source: Caltrans, 2014e

The construction of the Build Alternative may encounter contaminated soils and/or groundwater that could expose construction workers to the hazardous materials associated with these sites. Within the existing project limits, no other build alternatives were deemed viable because of the physical constraints associated with the developed land uses surrounding the I-680 corridor. Given these constraints, the current design of the Build Alternative would not be feasible without constructing improvements in the areas near the identified hazardous material sites. As such, these hazardous material sites cannot be avoided. Based on the results of in-depth soil/groundwater investigation for nearby projects, including the construction of the southbound I-680 express lane project that was completed in 2010, delaying subsurface investigations until the final design phase of the project is not expected to change the project design and cost.

Other Environmental Concerns

Aerially-Deposited Lead

Lead can be hazardous to humans as exposure can adversely affect the nervous, circulatory, and reproductive systems and can severely damage the brain and kidneys. Until their use was banned in the 1990s, additives in gasoline expelled lead-based compounds from engine exhaust. Consequently, lead was aerially deposited as a particulate. As a result, shallow soils within 30 feet of the edge of pavement in highway corridors have the potential to be contaminated with aerially-deposited lead (ADL) from historical car emissions. I-680 was constructed in the 1970s. Therefore, there is a potential for the presence of lead in soils adjacent to the roadway.

Asbestos-Containing Material and Lead-Based Paint

The Build Alternative proposes replacement of overpass structures, which may be coated with asbestos-containing materials and/or lead-based paint. Lead and asbestos are state-recognized carcinogens, and lead is a reproductive toxin. Asbestos fibers and lead particles emitted to the air during demolition activities could pose a risk to human health.[4] According to the California Department of Conservation, there are no reported historic asbestos mines, historic asbestos prospects, or other natural occurrences of asbestos within the project limits.

[4] ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ms/59/MS59_Plate.pdf; accessed November 13, 2013

Nonpoint-Source Metals

Nonpoint-source metals are metals from nonpoint runoff sources, such as urban development, agricultural fields, vehicle tires, and brake pads. These metals could accumulate in drainage swales and catch basins over time and pose a risk to human health and the environment.

Petroleum Pipelines

An underground petroleum pipeline crosses beneath an overpass within the project limits along South Grimmer Boulevard, which could be a source of potential soil and groundwater contamination from undocumented historical leaks (see **Figure 2.2-7**).

Yellow Traffic Stripes and Pavement Markers

Lead and hexavalent chromium have been used in yellow thermoplastic and yellow paint for traffic striping and pavement marking for many years and as recently as 2004. Residue from existing yellow thermoplastic and yellow paint striping and markings on roadways at the project limits may contain elevated concentrations of lead and hexavalent chromium that may produce toxic fumes when heated.

Asphalt-Concrete and Portland Cement

Asphalt-concrete and Portland cement grindings have a relatively high pH and may contain metals and petroleum hydrocarbons that can impact storm water runoff and threaten surface water quality.

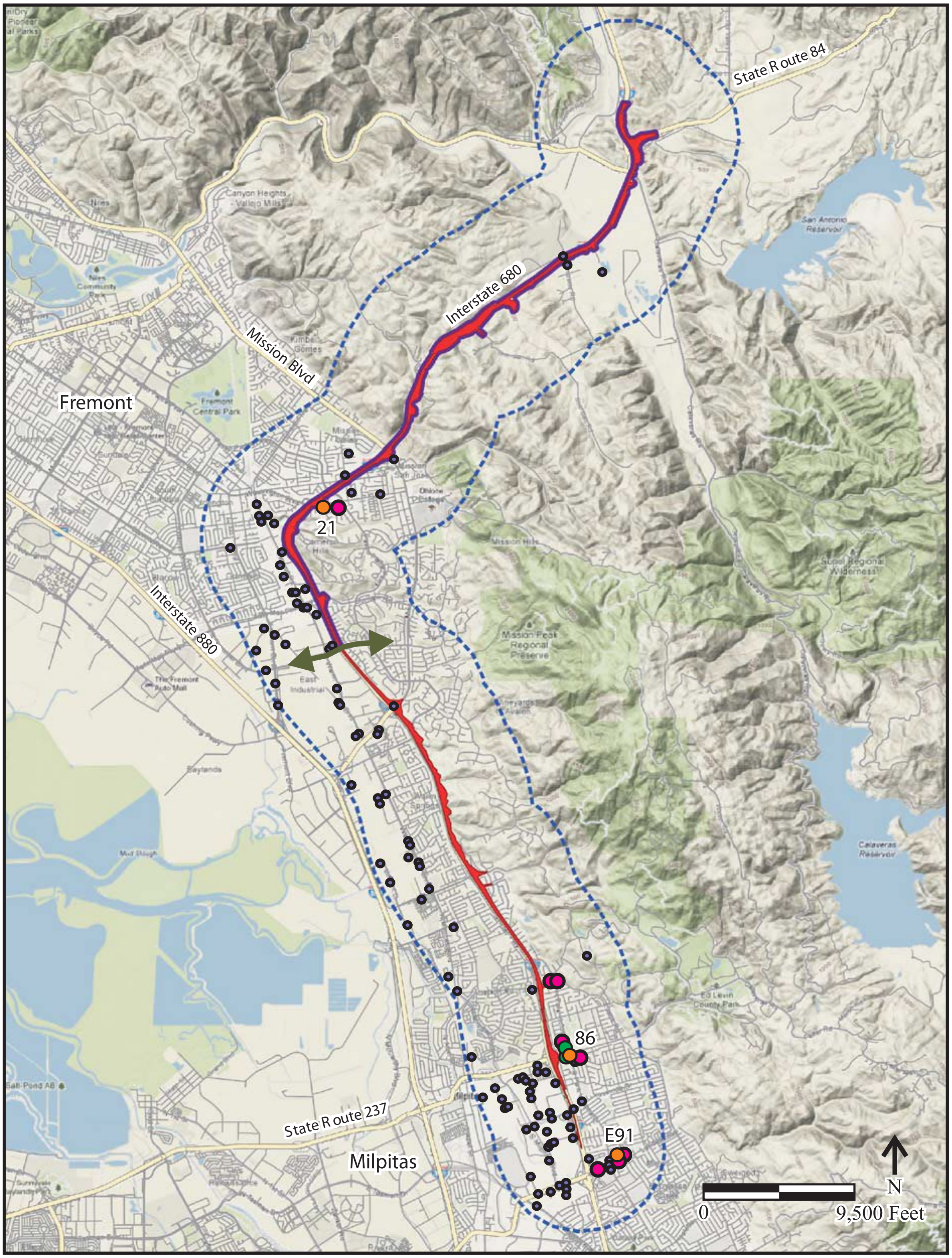
Agricultural Pesticides

Arsenic from inorganic pesticides and residues from organochlorine pesticides used in the past have the potential to persist for many decades in shallow soils and can affect human health and the environment, and could be present in shallow soils along the I-680 corridor where former agricultural development existed (see **Figure 2.2-8**).

Phase 1 – Initial Construction Phase

Contaminants of concern that could be encountered in soil and/or groundwater in during excavation activities within the Phase 1 segment are summarized in **Table 2.2.5-2**. Hazardous building materials may also be encountered during construction activities within the limits of Phase 1.

While the proportion of certain health risks may vary between the Phase 1 segment and future phases, there are no conditions or risks specific to the Phase 1 segment that would change the conclusions of the environmental consequences previously identified. **Figure 2.2-7** and **Figure 2.2-8** illustrate the hazardous materials sites and areas of concern in relation to the Phase 1 segment.



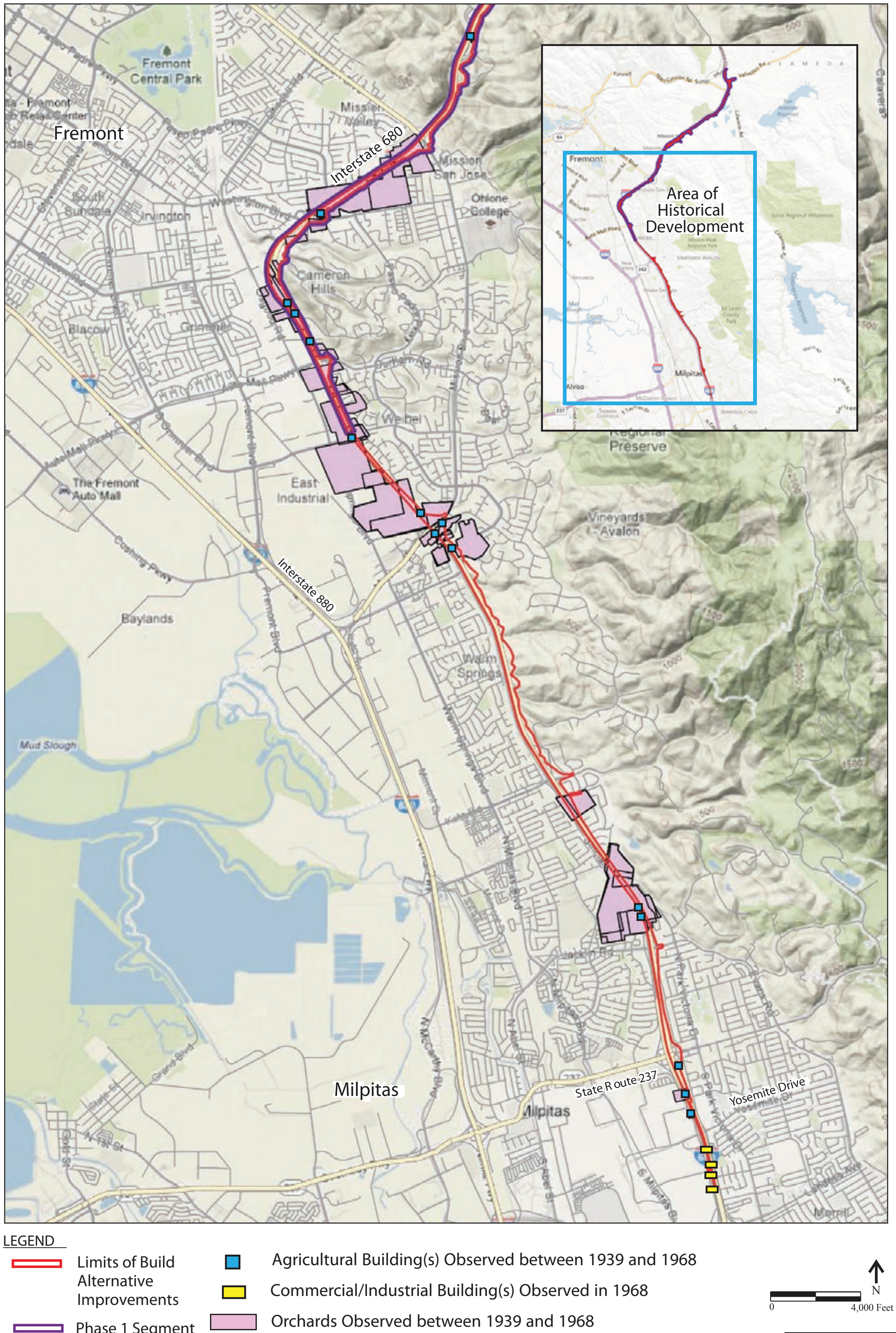
LEGEND

- Limits of Build Alternative Improvements
- Limits of Phase I Segment
- One-Mile Project Buffer
- Underground Petroleum Pipeline Crossing (Potential Release)
- 21 Hazardous Materials Release Site of Concern (Known Release)
- Dry Cleaner Site (Potential Release)
- Former Gas Station Site (Potential Release)
- Low Risk Hazardous Materials Release Site (Known Release)

Known and Potential Hazardous Material Sites of Concern

Figure 2.2-7

Source: Caltrans, 2014e



Historical Land Use Development

Figure **2.2-8**

Source: Caltrans, 2014e

No-Build Alternative

The No-Build Alternative assumes that the freeway travel lanes along northbound I-680 would remain as they currently exist. No bridge structures would be widened or replaced. Implementation of the other planned and approved projects in the vicinity would be subject to the same geological sensitivities as the Build Alternative, since they would occur in the same geologic region. These projects would be required to comply with Caltrans' standard design and construction guidelines regarding geological resources, which would be determined under separate environmental review.

Table 2.2.5-2 Areas with Potential Soil and Groundwater Contamination

Contaminant Source [A]	Affected Media	Constituent of Concern	Build Alternative	
			Phase 1 Segment	Full Alternative
Yellow Traffic Stripes and Pavement Markers	Existing roadway/ pavement	Lead and hexavalent chromium	X	X
Aerially-Deposited Lead	Exposed shallow soils	Lead	X	X
Former Orchards	Shallow soils	Arsenic and Organochlorine pesticides	X	X
Drainage Swales and Catch Basins	Exposed shallow soils	Title 22 metals	X	X
Former Agricultural Buildings	Groundwater	Petroleum hydrocarbons	X	X
Upgradient Dry Cleaners	Groundwater	Chlorinated solvents	X	X
Upgradient Quik Stop #98 Gas Station (Site 21, 1848 Washington Boulevard)	Groundwater	Petroleum hydrocarbons, including MTBE and TBA	X	X
Upgradient Unocal #5130 Gas Station (Site 86, 27 S Park Victoria Drive)	Groundwater	Petroleum hydrocarbons, including TBA		X
Upgradient Parktown 1-Hour Martinizing Dry Cleaner (Site E-91, 1350 S Park Victoria Drive)	Groundwater	Chlorinated solvents		X
Upgradient Former Gas Stations	Groundwater	Petroleum hydrocarbons		X
Petroleum Pipeline (along S Grimmer Boulevard)	Groundwater	Gasoline, Diesel, Jet fuel, BTEX, and PAHs		X

Contaminant Source [A]	Affected Media	Constituent of Concern	Build Alternative	
			Phase 1 Segment	Full Alternative
Former Commercial/ Industrial Buildings	Exposed shallow soils	Title 22 metals		X
	Groundwater	Petroleum hydrocarbons and Chlorinated solvents.		X

Notes:

A. **Figure 2.2-7 and Figure 2.2-8** illustrate the approximate location of the identified hazardous material release sites and areas of concern where soils and/or groundwater sampling may be warranted.

Source: Caltrans, 2014e

AVOIDANCE, MINIMIZATION, AND/ OR MITIGATION MEASURES

Build Alternative

Measure HAZ-1: During the final design phase of the project, a Preliminary Site Investigation would be performed to investigate hazardous materials concerns related to soil, groundwater, and construction materials within the project limits, as identified in the ISA. A work plan for the Preliminary Site Investigation would be submitted to Caltrans for review and approval. Additional investigation may be required to fully evaluate hazardous materials issues if concerns are identified during the Preliminary Site Investigation. All environmental investigations for the project would be provided to project contractors, so the findings may be incorporated into their Health and Safety and Hazard Communication Programs.

The general areas and contaminants of concern for investigating soil, groundwater, and construction materials are summarized further below. Based on the findings and recommendations of the Preliminary Site Investigation, the Build Alternative may need to implement special soil, groundwater, and construction materials management and disposal procedures for hazardous materials, as well as construction worker health and safety measures during construction. See measures **HAZ-2** through **HAZ-5**.

Aerially Deposited Lead

Measure HAZ-2: In accordance with Caltrans protocol, a Site Safety Plan would be prepared and implemented prior to initiation of any construction/development activities to reduce health and safety hazards to workers and the public. In accordance with Caltrans' Standard Special Provision 07-330, the contractor would be required to prepare a Lead Compliance Plan to prevent or minimize worker exposure.

Minimization measures to address ADL could include removing ADL soil, and/or balancing soil removal and fill to maximize reuse of ADL soil in the project area and not generate a hazardous waste. Handling of material containing ADL must result in no visible dust migration. A means of controlling dust must be available at all times when handling material in work areas containing ADL at hazardous waste concentrations.

Hazardous Building Materials

Measure HAZ-3: Hazardous building materials surveys would be conducted by a qualified professional for structures proposed for renovation as part of the Build Alternative. Lead-based paint and asbestos-containing material shall be included in the hazardous materials building surveys. All loose and peeling lead-based paint and asbestos-containing material would be removed by a certified contractor(s) in accordance with local, state, and federal requirements. All other hazardous materials would be removed from structures in accordance with California OSHA regulations.

Measure HAZ-4: Yellow thermoplastic and yellow paint striping and markings on existing roadways would be analyzed for lead chromate prior to disturbance or removal in accordance with Chapter 7 of Caltrans' Construction Manual. Yellow stripe and pavement markings would also be managed as an assumed hazardous waste by implementing a Lead Compliance Plan and testing the residues for hazardous-waste classification prior to off-site disposal in accordance with Caltrans Standard Special Provision 14 001. Asphalt-concrete and Portland cement concrete grindings would be reused in accordance with San Francisco Bay Regional Water Quality Control Board Water guidelines for Caltrans' projects or transported offsite for recycling or disposal.

Soil and Groundwater Investigations

Measure HAZ-5: Representative soil and/or groundwater sampling would be conducted by a licensed professional to evaluate the potential presence of hazardous materials in soil and groundwater within the project limits prior to construction and earthwork activities. The sampling would be performed in accordance with a work plan that has been reviewed and approved by Caltrans, and would address the areas of concern identified in **Table 2.2.5-2**. Soil samples collected to evaluate ADL would be analyzed for total lead and soluble lead to evaluate whether the Department of Toxic Substances Control's variance issued to Caltrans could apply. If applicable, the variance would determine whether the lead-affected soils could be reused as fill within the project area. Soil and groundwater analytical results would also be screened against the San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels to determine appropriate actions that would ensure the protection of construction workers, future site users, and the environment, and also be screened against hazardous waste thresholds to determine soil management options.

Implementation of the subsurface sampling for the entire Build Alternative alignment is anticipated to cost approximately $650,000. The soil and groundwater sampling would likely be a three-month endeavor, assuming property access and approval of the work plan is obtained in a timely fashion.

At a minimum, groundwater from dewatering of excavations, if any, would be stored in Baker tank(s) during construction activities and the water would be characterized prior to disposal or recycling. Similarly, excavated soil would be stockpiled for waste characterization and testing. This would be in addition to the pre-characterization of groundwater quality during the Preliminary Site Investigation.

If soil and/or groundwater contaminants are found, the regulatory authorities (federal, state or local) may require that the soils be removed or specially managed through hazardous waste closure plans, implementation of contingency plans, remediation orders, permits, or other administrative actions. The responsible party (i.e., property owner of the contaminated area) would comply with the instructions in those plans, orders, permits, or actions. Based on the areas of concern identified in **Table 2.2.5-2**, implementation of special soil and/or groundwater remediation and handling efforts during construction is anticipated to cost approximately $760,000.

Phase 1 – Initial Construction Phase

The discussion above identified all avoidance, minimization, and mitigation measures applicable to the Build Alternative including Phase 1. Implementation of the subsurface sampling in the high-risk areas within Phase 1 is anticipated to cost approximately $350,000. The soil and groundwater sampling would likely be a two-month endeavor, assuming property access and approval of the work plan is obtained in a timely fashion.

Based on the areas of concern identified in **Table 2.2.5-2**, implementation of special soil and/or groundwater remediation and handling efforts during construction, within Phase 1, is anticipated to cost approximately $390,000.

2.2.6 AIR QUALITY

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 U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to health concerns. The criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), which is broken down for regulatory purposes into particles of 10 micrometers or smaller—(PM_{10}) and particles of 2.5 micrometers and smaller—($PM_{2.5}$) and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at a level that protects 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 within their general definition.

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

Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (Caltrans) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attainting 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. Projects 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. U.S. EPA regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

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

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

AFFECTED ENVIRONMENT

The analysis summarized in this section is based on the Air Quality Technical Report prepared for the project (Caltrans, 2014a). The project is located within the San Francisco Bay Area Air Basin (SF Air Basin) and within the jurisdictional boundaries of the Bay Area Air Quality Management District (BAAQMD). These boundaries effectively make up the air quality study area for the project.

The concern of air quality impacts caused by changes in traffic patterns north of the project limits toward I-580, as well as increases in traffic congestion on local streets through Pleasanton, was raised by the City of Pleasanton during the scoping process for the project. The evaluation of these impacts is summarized in **Chapter 4.0, Comments and Coordination**, for informational purposes only.

The climate within the air quality study area is affected by its proximity to both the Pacific Ocean and the San Francisco Bay, which has a moderating influence. The Bay cools the air with which it comes in contact during warm weather and warms the air during cold weather. Typical summer maximum temperatures for the region are in the upper 70’s°F, while winter maximum temperatures are in the high 50’s°F or low 60’s °F. Minimum temperatures usually range from the high 50’s °F in the summer to the upper 30’s °F and low 40’s °F in the winter. Rainfall in the area occurs mostly in the months of November through March. Winds flow typically from the southwest.

Air quality in the region is controlled by meteorological conditions and the rate of pollutant emissions. Meteorological conditions such as wind speed, atmospheric stability, and mixing height may all affect the atmosphere’s ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while frequent, short-term variations result from changes in atmospheric conditions.

Air quality standards for ozone are traditionally exceeded when relatively stagnant wind conditions occur for periods of several days during the warmer months of the year. The regional meteorological factors make air pollution potential relatively high during summer and fall months. When high pressure dominates the weather, low mixing depths and bay and ocean wind patterns can concentrate and carry pollutants from other cities to this area, adding to the locally emitted pollutants.

Regional Air Quality Conformity

The BAAQMD monitors pollutants of concern, known as criteria pollutants, and air quality conditions throughout the SF Air Basin. **Table 2.2.6-1** includes a summary of the applicable air quality standards, the typical sources of pollutants and their associated health effects, and the SF Air Basin's attainment status with respect to the air quality standards. As shown in **Table 2.2.6-1**, the SF Air Basin is not in attainment of state or federal standards with respect to ozone (O_3) or Particulate Matter of 2.5 micrometers ($PM_{2.5}$). In addition, the SF Air Basin is not in attainment of state standards for Particulate Matter of 10 micrometers (PM_{10}).

Within three years of the effective date of designations, nonattainment areas for $PM_{2.5}$ are required to submit SIP revisions that, among other elements, provide for implementation of reasonably available control measures, reasonable further progress, attainment of the standard as expeditiously as practicable but no later than five years from the nonattainment designation (i.e., December 14, 2014), as well as contingency measures. ARB has requested that the U.S. EPA make a determination that the San Francisco Bay Area has since attained the $PM_{2.5}$ NAAQS since its 2009 non-attainment designation. As such, ARB is asking the U.S. EPA to determine that attainment-related SIP submittal requirements are not applicable for as long as the area continues to attain the standard. On October 29, 2012 the U.S. EPA proposed to determine that the San Francisco Bay Area has attained the $PM_{2.5}$ NAAQS. This proposed determination is based on recent ambient air monitoring data showing that the SF Air Basin has monitored attainment of the $PM_{2.5}$ NAAQS for the 2009–2011 monitoring period. If the U.S. EPA finalizes this determination of attainment, the only SIP requirements would include an updated emission inventory for primary $PM_{2.5}$, as well as precursor pollutants that contribute to formation of secondary particulate matter and amendments to BAAQMD's New Source Review to address $PM_{2.5}$. The Bay Area's $PM_{2.5}$ emission inventory was submitted to the U.S. EPA on January 14, 2013.

Existing Ambient Air Quality Standards

The BAAQMD maintains a network of air quality monitoring stations throughout the San Francisco Bay Area. The monitoring station closest to the southern end of the project limits is located in San Jose, at 158 East Jackson Street. The monitoring station closest to the northern portion of the project limits is located in Fremont, at 40733 Chapel Way. The highest air pollutant concentrations measured in any one year at the stations closest to the project limits are shown in **Table 2.2.6-2**. **Table 2.2.6-3** reports the number of days that ambient air quality standard were exceeded at the monitoring stations.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Regional Conformity

The proposed project is listed in the 2013 *Plan Bay Area* financially constrained Regional Transportation Plan (RTP) which was found to conform by MTC on July 18, 2013, and FHWA and FTA made a regional conformity determination finding on August 12, 2013. The project is also included in MTC's financially constrained 2013 Regional Transportation Improvement Program (RTIP), RTP Reference No. 22042 and TIP ID ALA130034.[5] The MTC 2013 RTIP was determined to conform by FHWA and FTA on August 12, 2013. The design concept and scope of the proposed project is consistent with the project description in the 2013 RTP, 2013 RTIP, and the open to traffic assumptions of the MTC's regional emissions analysis.

Project Level Conformity

Carbon Monoxide

The effects of the Build Alternative impacts from local traffic were evaluated by modeling roadside carbon monoxide concentrations. The modeling was conducted for the busiest mainline segment on I-680 where there would be a combination of the highest traffic volumes, greatest project traffic contribution, and highest level of traffic congestion. High volume freeways, such as I-680, have the greatest potential to cause high-localized concentrations of carbon monoxide. Of the two standards for carbon monoxide, the 8-hour standard is the more stringent. Modeling results are shown in **Table 2.2.6-4.** Modeling took into account the slowest speed and highest volume for each link to get the worst case predications. Based on the traffic information provided for project, the Phase 1 portion of the Build Alternative would have generally lower speeds than the Build Alternative; however the specific link (data) analyzed in the modeling had comparable speeds to the Build Alternative. The results indicate that current carbon monoxide concentrations are below ambient air quality standards and that future level with or without the Build Alternative would remain below the standards. The predicted decrease in future levels is due to vehicle fleet turnover, with newer (less polluting) vehicles replacing older vehicles. As a result, the project would not cause or contribute to any localized CO violations; and therefore, meets the "hot-spot" conformity requirements of 40 CFR 93.116(a).

Particulate Matter

Because the SF Air Basin is located within nonattainment areas for the federal and state $PM_{2.5}$ standards, and nonattainment for the state PM_{10} standard, a qualitative PM hot-spot analysis is required under the EPA Transportation Conformity rule for projects of air quality concern (POAQC).

On March 10, 2006, the U.S. EPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in $PM_{2.5}$ and PM_{10} nonattainment and maintenance areas (71 FR 12468). The federal PM_{10} standards have been met in the SF Bay Area, and therefore the Build Alternative is not subject to hot spot analysis for PM_{10} for purposes of transportation conformity. The federal $PM_{2.5}$ standards are exceeded in the SF Bay Area and the Build Alternative would be subject to hot spot analysis for $PM_{2.5}$ for purposes of transportation conformity. MTC's Air Quality Conformity Task Force met on October 25, 2012 as part of interagency consultation for the Build Alternative and took action to conclude that the Build Alternative was not a POAQC.

[5] MTC's 2013 RTIP originally listed the project under TIP ID No. ALA010014, and was revised to ALA130034 as part of Revision 2013-16 (dated May 26, 2014).

Table 2.2.6-1 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State [8] Standard	Federal [8] Standard	Principal Health and Atmospheric Effects	Typical Sources	I-680 Corridor Attainment Status
Ozone (O_3) 2	1 hour 8 hours	0.09 ppm 0.070 ppm	--- 4 0.075 ppm (4th 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 VOC may also contribute	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) 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.	Federal: No State: No
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm 1 6 ppm	35 ppm 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 ozone. 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.	Federal: Yes State: Yes
Respirable Particulate Matter (PM_{10}) 2	24 hours Annual	50 µg/m3 20 µg/m3	150 µg/m3 --- 2 (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.	Federal: Yes State: No

Pollutant	Averaging Time	State [8] Standard	Federal [8] Standard	Principal Health and Atmospheric Effects	Typical Sources	I-680 Corridor Attainment Status
Fine Particulate Matter ($PM_{2.5}$) 2	24 hours Annual 24 hours (conformity process 5) Secondary Standard (annual; also for conformity process 5)	--- 12 µg/m3 --- ---	35 µg/m3 12.0 µg/m3 65 µg/m3 15 µg/m3 (98th 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	Federal: No State: No
Nitrogen Dioxide (NO_2)	1 hour Annual	0.18 ppm 0.030 ppm	0.100 ppm 6 (98th percentile over 3 years) 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 ozone precursors	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations	Federal: Yes State: Yes
Sulfur Dioxide (SO_2)	1 hour 3 hours 24 hours	0.25 ppm --- 0.04 ppm	0.075 ppm 7 (99th percentile over 3 years) 0.5 ppm 9	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.	Federal: Yes State: Yes

Pollutant	Averaging Time	State [8] Standard	Federal [8] Standard	Principal Health and Atmospheric Effects	Typical Sources	I-680 Corridor Attainment Status
Lead (Pb)3	Monthly Rolling 3-month average	1.5 µg/m3 ---	--- 0.15 µg/m3 11	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. Aerially deposited lead from older gasoline use may exist in soils along major roads	Federal: Yes State: Yes
Sulfate	24 hours	25 µg/m3	---	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	Federal: n/a State: Yes
Hydrogen Sulfide (H_2S)	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	Federal: n/a State: Yes
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 Federal Clean Air Act, 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	Federal: n/a State: Yes

Pollutant	Averaging Time	State [8] Standard	Federal [8] Standard	Principal Health and Atmospheric Effects	Typical Sources	I-680 Corridor Attainment Status
Vinyl Chloride3	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer Also considered a toxic air contaminant	Industrial processes	Federal: n/a State: Yes

Notes: ppm = parts per million; µg/m3 = micrograms per cubic meter; ppb=parts per billion (thousand million)

1. Rounding to an integer value is not allowed for the state 8-hour CO standard. A violation occurs at or above 9.05 ppm.
2. Annual PM_{10} NAAQS revoked October 2006; was 50 µg/m3. 24-hr. $PM_{2.5}$ NAAQS tightened October 2006; was 65 µg/m3. Annual $PM_{2.5}$ NAAQS tightened from 15 µg/m3 to 12 µg/m3 December 2012 and secondary annual standard set at 15 µg/m3.
3. The ARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both the ARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone 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.
4. Prior to 6/2005, the 1-hour ozone NAAQS was 0.12 ppm. Emission budgets for 1-hour ozone are still in use in some areas where 8-hour ozone emission budgets have not been developed, such as the SF Bay Area.
5. The 65 µg/m3 $PM_{2.5}$ (24-hr) NAAQS was not revoked when the 35 µg/m3 NAAQS was promulgated in 2006. The 15 µg/m3 annual $PM_{2.5}$ standard was not revoked when the 12 µg/m3 standard was promulgated in 2012. The 0.08 ppm 1997 ozone standard is revoked FOR CONFORMITY PURPOSES ONLY when area designations for the 2008 0.75 ppm standard become effective for conformity use (7/20/2013). Conformity requirements apply for all NAAQS, including revoked NAAQS, until emission budgets for newer NAAQS are found adequate, SIP amendments for the newer NAAQS are approved with a emission budget, EPA specifically revokes conformity requirements for an older standard, or the area becomes attainment/unclassified. SIP-approved emission budgets remain in force indefinitely unless explicitly replaced or eliminated by a subsequent approved SIP amendment. During the "Interim" period prior to availability of emission budgets, conformity tests may include some combination of build vs. no build, build vs. baseline, or compliance with prior emission budgets for the same pollutant.
6. Final 1-hour NO_2 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 redesignation to nonattainment in some areas after 2016.
7. EPA finalized a 1-hour SO_2 standard of 75 ppb in June 2010. Nonattainment areas have not yet been designated as of 9/2012.
8. State standards are "not to exceed" or "not to be equaled or exceeded" unless stated otherwise. Federal standards are "not to exceed more than once a year" or as described above.
9. Secondary standard, set to protect public welfare rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.
10. Standards no longer apply in CA starting in 2013 (1 year after designations to attainment/unclassified statewide) were completed. Do not use or quote any more. Will be removed in 2013 edition of this table.
11. Lead NAAQS are not considered in Transportation Conformity analysis.

Source: Caltrans, 2014a

Table 2.2.6-2 Highest Measured Air Pollutant Concentrations

Pollutant	Average Time	Measured Air Pollutant Levels				
		2009	**2010**	**2011**	**2012**	**2013**
San Jose						
Ozone (O_3)	1-Hour	0.09 ppm	**0.13 ppm**	**0.10 ppm**	**0.10 ppm**	0.9 ppm
	8-Hour	0.07 ppm	**0.09 ppm**	0.07 ppm	0.06 ppm	**0.08 ppm**
	1-Hour	3.4 ppm	2.8 ppm	2.5 ppm	2.6 ppm	3.1 ppm
Carbon Monoxide (CO)	8-Hour	2.5 ppm	2.2 ppm	2.3 ppm	1.9 ppm	2.5 ppm
Nitrogen Dioxide (NO_2)	1-Hour	0.07 ppm	0.06 ppm	0.06 ppm	0.07 ppm	.06 ppm
	Annual	0.02 ppm	0.01 ppm	0.02 ppm	0.01 ppm	.02 ppm
Respirable Particulate Matter (PM_{10})	24-Hour	43 ug/m^3	47 ug/m^3	44 ug/m^3	**60 ug/m^3**	**58 ug/m^3**
	Annual	20 ug/m^3	20 ug/m^3	19 ug/m^3	19 ug/m^3	**22.3 ug/m^3**
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	35 ug/m^3	**42 ug/m^3**	**51 ug/m^3**	**38 ug/m^3**	**58 ug/m^3**
	Annual	10 ug/m^3	9 ug/m^3	10 ug/m^3	9 ug/m^3	**12 ug/m^3**
Fremont						
Ozone (O_3)	1-Hour	**0.10 ppm**	**0.12 ppm**	NA	NA	NA
	8-Hour	**0.075 ppm**	**0.08 ppm**	NA	NA	NA
	1-Hour	2.5 ppm	1.6 ppm	NA	NA	NA
Carbon Monoxide (CO)	8-Hour	1.2 ppm	0.9 ppm	NA	NA	NA
Nitrogen Dioxide (NO_2)	1-Hour	0.05 ppm	0.06 ppm	NA	NA	NA
	Annual	0.01 ppm	0.01 ppm	NA	NA	NA
Respirable Particulate Matter (PM_{10})	1-Hour	NA	NA	NA	NA	NA
	Annual	NA	NA	NA	NA	NA
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	**39 ug/m^3**	26 ug/m^3	NA	NA	NA
	Annual	9 ug/m^3	10 ug/m^3	NA	NA	NA

Note: ppm = parts per million
Values reported in bold exceed ambient air quality standard
NA = data not available.
Source: Caltrans, 2014a

Table 2.2.6-3 Number of Days Exceeding NAAQS and/or CAAQS (California Ambient Air Quality Standards)

Pollutant	Standard	Monitoring Station	Days Exceeding Standard 2009	2010	2011	2012	2013
Ozone (O_3)	NAAQS 8-hr	San Jose	0	3	0	0	1
		Fremont	0	1	NA	NA	NA
	CAAQS 1-hr	San Jose	0	5	1	1	0
		Fremont	4	1	NA	NA	NA
	CAAQS 8-hr	San Jose	0	3	0	0	1
		Fremont	2	1	NA	NA	NA
Respirable Particulate Matter (PM_{10})	NAAQS 24-hr	San Jose	0	0	0	0	0
		Fremont	NA	NA	NA	NA	NA
	CAAQS 24-hr	San Jose	0	0	0	1	5
		Fremont	NA	NA	NA	NA	NA
Fine Particulate Matter ($PM_{2.5}$)	NAAQS 24-hr	San Jose	0	3	3	2	6
		Fremont	1	0	NA	NA	NA
All Other (CO, NO_2, Lead, SO_2)	All Other	San Jose	0	0	0	0	0
		Fremont	0	0	NA	NA	NA

Note: NA = data not available
Source: Caltrans, 2014a

Table 2.2.6-4 Worst-Case 1-Hour and 8-Hour Carbon Monoxide Concentrations

Roadway Segment	Parts Per Million (PPM) Existing		2020 No-Build		2020 Build Phase 1		2020 Build Build Alternative		2040 No-Build		2040 Build Phase 1		2040 Build Build Alternative	
	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr
Calaveras Rd (SR-84) to Vallecitos Road (SR-84)[1]	6.0	4.7	4.0	3.2	3.9	3.1	3.9	3.1	4.6	3.6	4.5	3.6	4.4	3.5
Mission Blvd. to Auto Mall Pkwy	5.3	4.2	3.9	3.1	3.7	2.9	3.7	2.9	4.6	3.6	4.4	3.5	4.3	3.4
Auto Mall Pkwy to Washington Blvd.	5.8	4.6	4.0	3.2	4.1	3.2	4.1	3.2	5.1	4.0	4.4	3.5	4.5	3.6
NAAQS	35	9	35	9	35	9	35	9	35	9	35	9	35	9
CAAQS	20	9	20	9	20	9	20	9	20	9	20	9	20	9

Note:
1. Within the Phase 1 segment

Source: Caltrans, 2014a

A quantitative analysis was performed to identify and compare the potential differences among particulate matter emissions (both PM_{10} and $PM_{2.5}$) from the Build Alternative. Project level operational emissions are shown in **Table 2.2.6-5**. Emissions associated with implementation of the Build Alternative were obtained by comparing future with-project emissions to future without-project emissions for both the construction interim year (2020) and design-future year (2040) scenarios. For comparison purposes only, the BAAQMD significance thresholds were added to the table to determine whether the project would result in levels of emissions that exceed thresholds used by local air quality agencies. As shown in the table, project emissions for both 2020 and 2040 fall well below the thresholds used by BAAQMD.

Table 2.2.6-5 I-680 Project Related Emissions (pounds per day)

Scenario	ROG	NOx	PM_{10}	$PM_{2.5}$
Existing	618	1,865	164	89
2020 No Build	317	847	143	65
2020 Build	324	854	148	67
2040 No Build	277	535	168	76
2040 Build	299	569	187	83
2020 Build to Existing	-294	-1,012	-16	-23
2040 Build to Existing	-319	-1,297	22	-6
2020 Build to 2020 No Build	7	7	5	2
2040 Build to 2040 No Build	22	33	19	8
BAAQMD Significance Thresholds (for comparison only)	*54*	*54*	*82*	*54*

Note: Emissions calculations based on CT_EMFAC.
A. CO_2 Presented in metric tons per year
Source: Caltrans, 2014a

U.S. EPA and FHWA guidance do not consider this project to be a POAQC. Although the construction of the northbound HOV/express lane under the Build Alternative would allow for an Annual Average Daily Traffic (AADT) that exceeds the FHWA and EPA's POAQC threshold of 125,000 ADT, this facility primarily services gasoline vehicles. Truck percentages are not in excess of the FHWA and EPA's POAQC threshold of 8 percent (10,000 diesel truck ADT), as the current diesel truck percentage ranges from 5.1percent to 5.5 percent within the project area. This equates to an existing truck AADT between 6,760 and 7,250 and with the Build Alternative the truck ADT would be between 8,180 and 8,775. It should also be noted that implementation of the Build Alternative would not significantly affect diesel truck volumes and percentages between Build and No-Build alternatives (i.e., effects to truck percentages would be reduced by 0.3 percent between the No-Build and Build Alternatives).

Mobile Source Air Toxics (MSAT)

California's vehicle emissions control and fuel standards are more stringent than federal standards, and are effective sooner, so the effect on air toxics of combined state and federal regulations is expected to result in greater emission reductions, more quickly, than the FHWA analysis shows. The FHWA analysis, with modifications related to use of the California-specific EMFAC model rather than the MOBILE model, would be conservative.

The design year traffic volumes under the Build Alternative are projected to exceed 140,000 to 150,000 AADT. Caltrans reports annual average daily traffic volumes of 119,000 to 139,000 vehicles per average day. Traffic levels in the future would increase above 140,000 average annual daily trips.

FHWA has issued Interim Guidance on Air Toxic Analysis in NEPA Documents. In this guidance, FHWA identified three levels of analysis:

1. *Category 1* Projects are projects with No Meaningful Potential MSAT Effects or Exempt Projects. The types of projects included in this category are projects qualifying as a categorical exclusion under 23 CFR 771.117(c), Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126, or other projects with no meaningful impacts on traffic volumes or vehicle mix.
2. *Category 2* projects are projects with Low Potential MSAT Effects. The types of projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions.
3. *Category 3* Projects are projects with Higher Potential MSAT Effects. This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives.

The Build Alternative meets the Category 2 project criteria, in that it has a low potential MSAT, because the project would improve traffic operations without adding substantial new capacity. As defined above, the FHWA guidance considers a "meaningful increase in MSAT emissions" as a project that serves a significant volume of diesel truck traffic, such as a facility with greater than 125,000 ADDT, and where 8 percent or more of such AADT is diesel truck traffic.[6] The design year for the Build Alternative for traffic is projected to exceed 140,000 to 150,000 AADT, which is above the 125,000 AADT in the FHWA guidance. However, the truck percentage and truck AADT is less than 8 percent and the AADT truck traffic is less than 10,000. For these reasons, the Build Alternative remains in the Category 2 project bracket since it would not result in a meaningful increase in MSAT emissions.

[6] *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (FHWA and EPA 2006).

Based on FHWA guidance, a more rigorous analysis of MSAT impacts was conducted. This approach included a quantitative analysis to forecast local-specific emission trends of the priority MSAT for each alternative, to use as a basis of comparison. **Table 2.2.6-6** represents the total MSAT emissions from traffic on I-680 for five scenarios as listed.

For the Build Alternative in this EA specify, the amount of MSAT emitted would be proportional to the vehicle miles traveled (VMT). The VMT estimated the Build Alternative is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. Refer to **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities, Table 2.1.7-10**. This increase in VMT would lead to higher MSAT emissions for the Build Alternative along the freeway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

Table 2.2.6-6 Project MSAT Emissions in Grams per Day

Pollutant	Existing	2020 No-Build	2020 Phase 1	2020 Build	2040 No-Build	2040 Phase 1	2040 Build
Benzene	5,498	2,642	2,675	2,675	2,387	2,649	2,505
Acrolein	222	<86	<89	<89	<78	85	<81
Formaldehyde	6,141	2,574	2,320	2,320	2,767	2,959	2,606
Butadiene	999	385	391	391	355	391	365
Naphthalene	354	221	209	209	287	325	285
POM	<115	<47	<46	<46	<57	<57	<57
Diesel PM	17,771	4,812	4,999	4,999	5,087	5,252	5,252
DEOG	20,199	9,629	7,644	7,644	11,651	12,182	10,258

Source: Source: Caltrans, 2014a

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of freeway 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 U.S. Environmental Protection Agency (EPA) 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 Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects".[7] 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 (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents.[8] 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[9] or in the future as vehicle emissions substantially decrease.[10]

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.

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[7] EPA, 2014. Integrated Risk Information System (IRIS). Available at: http://www.epa.gov/iris/; Last Accessed: October 23, 2014.

[8] FHWA, 2012. *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA.* Available at: http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm; Last accessed: October 23, 2014.

[9] HEI, 2007. *Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects*. Available at: http://pubs.healtheffects.org/view.php?id=282; Last accessed: October 23, 2014.

[10] HEI, 2009. *A Special Report of the Institute's Panel on the Health Effects of Traffic-Related Air Pollution*. Available at: http://pubs.healtheffects.org/view.php?id=306; Last accessed: October 23, 2014.

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 HEI.[11] 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 PM. The EPA[12] and the HEI[13] have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act 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 EPA to determine an "acceptable" level of 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 EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of freeway 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.

Additional Environmental Analysis

The Bay Area is considered a nonattainment area for ground-level ozone and $PM_{2.5}$ under both the federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM_{10} under the California Clean Air Act, but not the federal Act. The area has attained both state and federal ambient air quality standards for carbon monoxide. Transportation plans that have been found to conform to the State Implementation Plan (SIP) are not considered to cause or contribute to violations of ambient air quality standards. Furthermore, a project included in a

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[11] HEI, 2007. *Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects*. Available at: http://pubs.healtheffects.org/view.php?id=282; Last accessed: October 23, 2014.
[12] U.S. EPA, 2012. Basic Information on Risk Assessments. Available at: http://www.epa.gov/risk/basicinformation.htm#g; Last accessed: October 23, 2014.
[13] HEI, 2007. *Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects; HEI Special Report 16 [Summary of Studies on Diesel Exhaust]*. Available at: http://pubs.healtheffects.org/getfile.php?u=395; Last Accessed, October 23, 2014.

conforming plan would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Conforming transportation plans are subject to a threshold of no net increase in emissions. Because the Build Alternative is included in Plan Bay Area 2040 and 2013 TIP, which conform to the SIP, the project would not result in a cumulatively considerable net increase of any criteria pollutant.

Naturally Occurring Asbestos

According to information presented in the Department of Conservation Division of Mines and Geology map, naturally occurring asbestos is not indicated in the project footprint or in the vicinity of the project limits. **Section 2.2.5, Hazardous Waste/Materials** discusses potential asbestos-containing material in the bridge structures within the project limits. In accordance with **Measure HAZ-3**, all asbestos-containing material would be removed by a certified contractor(s) in accordance with local, state, and federal requirements to prevent asbestos fibers from being emitted into the air during demolition activities.

Temporary Construction Impacts

Dust would be generated during grading and construction operations. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed, amount of activity, soil conditions, and meteorological conditions.

Although grading and construction activities would be temporary, they would have the potential to cause both nuisance and health air quality impacts for sensitive receptors adjacent to the project limits. PM_{10} is the pollutant of greatest concern associated with dust. If uncontrolled, elevated PM_{10} levels could occur downwind of actively disturbed areas. In addition, dust fall on adjacent properties could be a nuisance.

Average daily construction exhaust emissions were modeled using the construction year (2017), total expected duration (17 months) and the length of the project limits. Other model inputs such as area of disturbance and soil imported on a daily basis were estimated based on conservative and reasonable assumptions for similar construction projects. **Table 2.2.6-7** presents these emissions predictions for the Build Alternative.

Construction equipment and associated heavy-duty truck traffic generates diesel exhaust, which is a known Toxic Air Contaminant. Diesel exhaust poses both a health and nuisance impact to nearby receptors.

Construction activities will not last for more than five years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)).

Table 2.2.6-7 Daily Maximum Construction Emissions

Construction Phase	Pollutant			
	ROG	NO_x	Exhaust PM_{10}	Exhaust $PM_{2.5}$
Grubbing/Land Clearing	7.2 lbs/day	34.2 lbs/day	2.0 lbs/day	1.8 lbs/day
Grading/Excavation	8.1 lbs/day	39.3 lbs/day	2.3 lbs/day	2.0 lbs/day
Drainage/Utilities/Sub-grade	6.8 lbs/day	32.0 lbs/day	2.0 lbs/day	1.8 lbs/day
Paving	9.1 lbs/day	53.4 lbs/day	3.5 lbs/day	3 2 lbs/day
BAAQMD Significance Thresholds (for comparison only)	*54 lbs/day*	*54 lbs/day*	*82 lbs/day*	*54 lbs/day*

Source: Caltrans, 2014a

Phase 1 – Initial Construction Phase

Based on the forecasted traffic volumes for the year 2020, there is no difference in the volume of traffic and speeds between the full Build Alternative and Phase 1. This results in no anticipated differences in the modeling of emissions presented in **Tables 2.2.6-4** and **2.2.6-6** for these 2020 scenarios. In year 2040, the traffic volumes remain the same for the Phase 1 and the Build Alternative, but there is a slight difference in the average speeds during the peak commute periods. The Phase 1 speeds are in general lower than the Build Alternative.

Table 2.6-4 shows the differences in the year 2040 modeled CO emissions for roadway segments within the project limits. When compared to the full Build Alternative, Phase 1 CO levels were 0.1 ppm higher at two locations, and 0.1 ppm lower at the third location; this equates to a 2 percent increase in CO emissions at the first two locations and a 2 percent decrease in CO emissions at the third location.

Table 2.6-6 represents the total MSAT emissions from traffic on I-680, including the isolated Phase I scenarios. Emissions for all MSATs are projected to decrease considerably over Existing Conditions. For example, diesel particular matter (DPM) is projected to experience a decrease of approximately 70 percent over time. Due to increase in traffic and speed, DPM emissions with the Phase 1 project would be about 4 percent higher than the No-Build scenario, while the full build (Build Alternative) would be about 3 percent higher. Emission factors for DPM are lowest at 40 miles per hour. DPM emissions are greater for vehicle speeds higher or lower than this speed. The Build Alternative, including Phase 1, would result in higher speeds of over 40 miles per hour, which would cause an increase in DPM emissions. Neither scenario would result in a meaningful increase in MSAT emissions [refer to *Mobile Source Air Toxics (MSAT)* discussion above].

The environmental effects applicable to the Build Alternative are also applicable to Phase1. All conformity determinations applicable to the Build Alternative would apply to Phase 1.

No-Build Alternative

The No-Build Alternative assumes that the existing I-680 would remain in place and no further action of improvements would occur. The currently planned and funded projects within the air quality study area would be required to adhere to the applicable state requirements under separate review, which would protect air quality in the study area.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Construction Related Minimization Measures

Measure AIR-1: Construction period to air quality effects are short-term in duration and, therefore, will not result in long-term adverse conditions. Implementation of the following 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:

- The construction contractor must comply with Caltrans' Standard Specifications in Section 14-9 (2010).
- Section 14-9-02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
- Section 14-9.03 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are described in Section 18.

Measure AIR-2: Water or dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a "no visible dust" criterion either at the point of emissions or at the right-of-way line depending on local regulations.

Measure AIR-3: Measures to reduce PM_{10}, $PM_{2.5,}$ and diesel particulate matter from construction would be incorporated to the extent feasible to ensure that short-term health impacts to nearby sensitive receptors are avoided. Such measures include:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power' sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.

- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. At a minimum, all equipment should meet the current CARB fleet standards.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Operational Related Measures

No avoidance, minimization, and/or mitigation measures are required for the operation of the Build Alternative, as the proposed improvements would not produce substantial operational air quality effects.

Phase 1 – Initial Construction Phase

Caltrans' standard specifications and dust control measures are applicable to the entire Build Alternative alignment, including Phase 1. No avoidance, minimization, or mitigation measures would be required beyond the implementation of the Caltrans' standard specifications.

Climate Change

Climate change is analyzed in **Section 3.2.7, Climate Change**. Neither U.S. EPA nor FHWA has issued explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will facilitate decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the **Chapter 3, California Environmental Quality Act (CEQA) Evaluation**, of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the state has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

2.2.7 NOISE

REGULATORY SETTING

NEPA and the 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 such measures are not feasible. The rest of this section will focus on the NEPA-23 CFR 772 noise analysis; please see **Chapter 3**, **CEQA Evaluation** 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 (and Caltrans, as assigned) involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain 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 dBA) is lower than the NAC for commercial areas (72 dBA). **Table 2.2.7-1** lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2.2.7-1 Noise Abatement Criteria

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

Note: 1-Includes undeveloped lands permitted for this activity category.
Source: Caltrans, 2011. Traffic Noise Analysis Protocol

According to Caltrans' Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects, May 2011, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC. The No-Build Alternative is the baseline for comparing noise impacts.

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

Caltrans' Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered acoustically feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: the noise reduction design goal (at least 7 dB of noise reduction at one or more benefitted receptors), residents acceptance and the cost of the noise abatement.

AFFECTED ENVIRONMENT

The information for noise analysis was obtained through the Noise Technical Report prepared for the project (Caltrans, 2014i). The noise study area encompasses all developed land uses surrounding the project limits, with a focus on noise-sensitive land uses. 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. Commercial land uses including hotels, motels, and offices are also sensitive to noise.

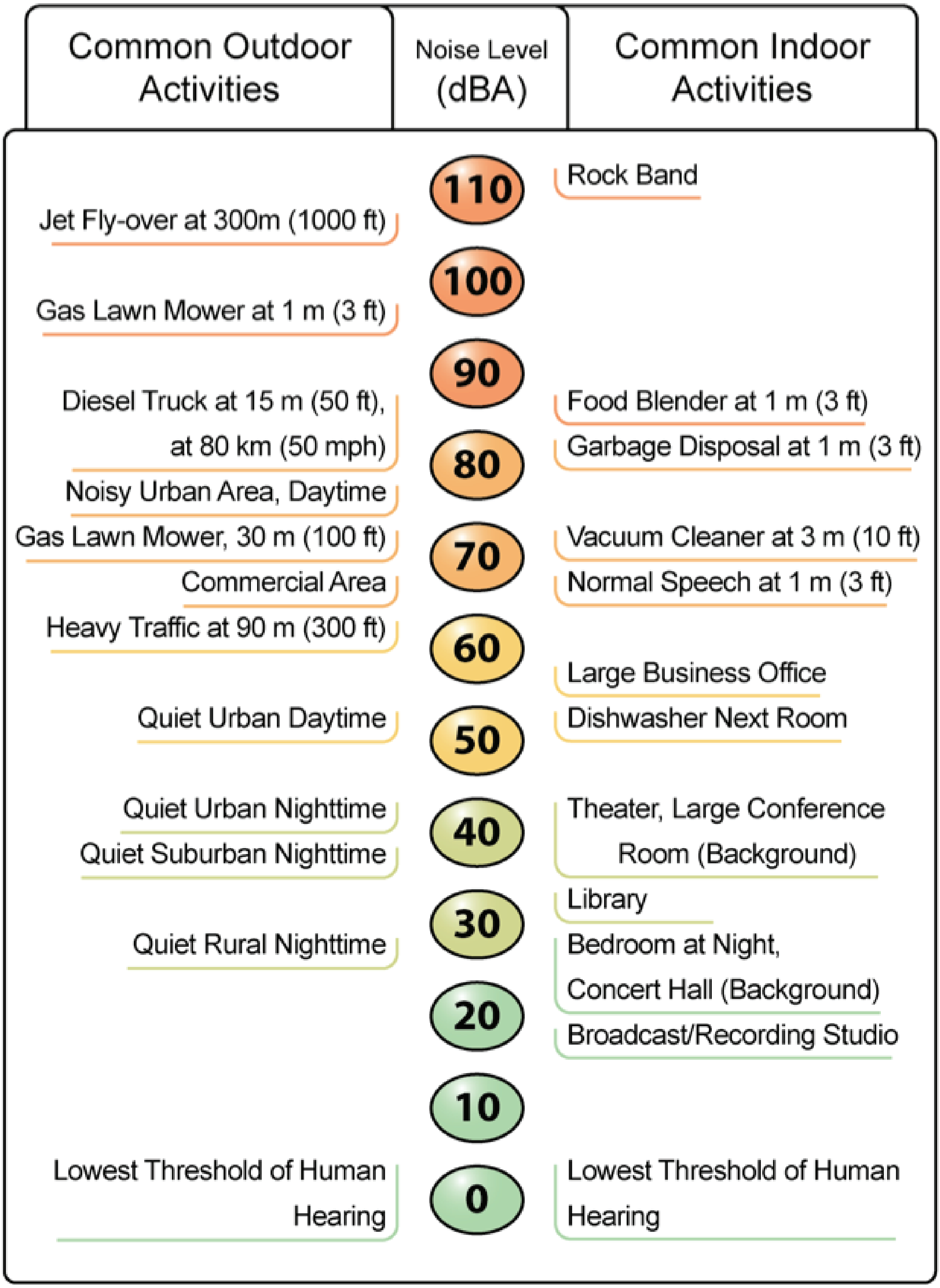
Noise-sensitive land uses in the vicinity of the project limits include single- and multi-family residences, active recreational areas, day care centers, churches, and hotels. The existing noise environment throughout the project limits varies by location, depending on site characteristics such as proximity to major roadways or other major sources of noise, the relative elevation of roadways and receptors, and any intervening structures or barriers. The noise study area was divided into ten segments for noise modeling and noise abatement assessment purposes.

The concern of noise impacts caused by changes in traffic patterns north of the project limits toward I-580, as well as increases in traffic congestion on local streets through Pleasanton, was raised by the City of Pleasanton during the scoping process for the project. The evaluation of these impacts is summarized in **Chapter 4.0, Comments and Coordination**, for informational purposes only.

Noise Modeling

Short- and long-term field measurements were taken to document the current noise environment within the noise study area. **Appendix H** includes detailed illustrations 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, and the trends in hourly noise levels measured at nearby representative long-term measurement sites. A direct comparison of the data collected simultaneously at the long-term and short-term noise measurement sites was made to calculate worst-hour noise levels at the short-term measurement locations. These data were then compared to the worst-hour noise levels predicted for existing conditions to confirm that the model accurately reflects the measured noise data. At all locations, noise levels were measured 5-feet above the ground surface and at least 10 feet from structures or barriers. Noise measurement locations were used as noise modeling receivers for the prediction of existing and future worst-hour traffic noise levels. **Table 2.2.7-2** through **Table 2.2.7-11** summarize the long and short-term existing, 2040 No-Build, and 2040 Build worst-hour noise levels by each segment of the noise study area.

One-hundred five (105) short-term noise measurements were made concurrent with the data being collected at the long-term measurement sites. This facilitates a direct comparison between both the short-term and long-term reference noise measurements and allows for the identification of the worst-hour noise levels at Category B, C, D, and E land uses in the vicinity of the project limits. Forty (40) short-term noise measurements were made within the noise study area in Milpitas; fifty-eight (58) short-term noise measurements were made in Fremont; and seven (7) short-term noise measurements were made in Sunol.



Noise Levels of Common Activities Figure **2.2-9**

Source: Caltrans Standard Environmental Reference, 2013

Existing Conditions

A summary of the existing and planned sensitive land uses within each noise study segment and the current noise levels at these locations is provided below. Future development considered in the noise analysis include those that have received final development approval and are within approximately 500 feet of the centerline of I-680, where traffic noise levels from the highway could dominate the noise environment. Future developments located beyond this distance are excluded from further analysis. Most of the land uses within the noise study area are built-out; however, there are a few residential projects in the Cities of Milpitas and Fremont, which would be developed in the future. No future development of noise-sensitive projects is proposed within the portion of the noise study area that is in Alameda County.

Segment 1 – Southernmost project limit (approximately Chewpon Avenue) to East Calaveras Boulevard (SR 237)

Segment 1 of the noise study area contains Activity Category B (residences), C (Day Star Montessori School), D (True Jesus Church and Gospel Christian Church), and E (the Executive Inn) land uses to the east of I-680, along Dempsey Road. Existing worst-hour noise levels range from 63 to 72 dBA. No existing noise barriers were identified within this segment.

There are two future residential developments in the City of Milpitas that are proposed in the vicinity of segment 1 of the noise study area: the Sinclair Renaissance Residential Project (80 single family residential units, located approximately 235 feet from the center of I-680), and the residential development at 905-980 Los Coches Street (83 dwelling units, located approximately 163 feet from an I-680 on ramp), as further described in **Section 2.4, Cumulative Impacts**. Both development projects propose noise barriers as part of the design to maintain exterior noise levels below the applicable NAC thresholds.

Segment 2 – East Calaveras Boulevard (SR 237) to Jacklin Road

Segment 2 of the noise study area contains Activity Category B (residences), D and E (Extended Stay America Hotel, Church of Christ Milpitas, and the Wing Education Center) land uses to the east and west of I-680. Existing worst-hour noise levels range from 62 to 68 dBA. Existing 12 to 16-foot-high noise barriers shield many of the noise sensitive land uses within this segment from I-680 traffic noise.

Segment 3 – Jacklin Road to Scott Creek Road

Segment 3 of the noise study area contains Activity Category B residential land uses to the east and west of I-680. Existing worst-hour noise levels range from 55 to 69 dBA. Existing 9 to 15-foot-high noise barriers provide noise reduction to the noise sensitive land uses within this segment.

Segment 4 – Scott Creek Road to Mission Boulevard (SR 262)

Segment 4 of the noise study area contains Activity Category B (residences), C (baseball field, Mormon Temple) and E (Extended Stay America Inn) land uses to the east and west of I-680.

Existing worst-hour noise levels range from 53 to 68 dBA. Existing 10-to 16-foot-high noise barriers provide noise reduction to the residences within this segment.

There is one future residential development in the City of Fremont that is proposed in the vicinity of segment 4 of the noise study area: the Sabercat Neighborhood Center Project (144 multi-family residential units, located approximately 160 feet from the center of northbound I-680). This approved development would have worst-hour traffic noise levels maintained below NAC thresholds.

Segment 5 – Mission Boulevard (SR 262) to Auto Mall Parkway/Durham Road

Segment 5 of the noise study area contains Activity Category B (residences) land uses to the east of I-680, and one Category E (Motel 6) land use to the west 0f I-680. Existing worst-hour noise levels range from 60 to 70 dBA. Existing 6 to 16-foot-high noise barriers provide noise reduction to residences within this segment.

Segment 6 – Auto Mall Parkway/Durham Road to Washington Boulevard (Phase 1)

Segment 6 of the noise study area contains Activity Category B residential land uses to the east and west of I-680, and Activity Category D land uses (two churches and a day care center) west of I-680, on Osgood Road. Existing worst-hour noise levels range from 52 to 79 dBA. An existing 8-foot-high noise barrier provides noise reduction to a small section of residences east of I-680, along Homestead Court.

Segment 7 – Washington Boulevard to Mission Boulevard (SR 238) (Phase 1)

Segment 7 of the noise study area contains Activity Category B (residences) land uses northwest and southeast of I-680. Existing worst-hour noise levels range from 56 to 75 dBA. Existing 8- to 14-foot-high noise barriers shield residences within this segment.

There is one future residential development in the City of Fremont that is proposed in the vicinity of segment 7 of the noise study area: the Mission Creek Residential Project (single family residences northwest of I-680, between Palm Avenue and Mission Boulevard). This approved development would have worst-hour traffic noise levels maintained below NAC thresholds.

Segment 8 – Mission Boulevard (SR 238) to Vargas Road (Phase 1)

Segment 8 of the noise study area contains Activity Category B (residences) land uses to the east of I-680. Existing worst-hour noise levels range from 65 to 73 dBA. An existing 6-foot-high noise barrier provides noise reduction to a small section of residences east of I-680, along Mission Road.

There is one future residential development in the City of Fremont that is proposed in the vicinity of segment 8 of the noise study area: the 42425 Mission Boulevard Residential Project (residential development 435 feet from the center of I-680). This approved development would have worst-hour traffic noise levels maintained below NAC thresholds.

Segment 9 – Vargas Road to Andrade Road (Phase 1)

Segment 9 of the noise study area contains Activity Category B (residences) land uses to the west of I-680. Existing worst-hour noise levels range from 61 to 69 dBA. No existing noise barriers were identified within this segment.

Segment 10 – Andrade Road to Vallecitos Road (SR 84) (Phase 1)

Segment 10 of the noise study area contains Activity Category B (residences) land uses to the east of I-680, and Activity Category C (Sunol Valley Golf Course) to the west. Existing worst-hour noise levels range from 64 to 80 dBA. No existing noise barriers were identified within this segment.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The Code of Federal Regulations (23 CFR 772) "Procedures for Abatement of Highway Traffic Noise" provides procedures for preparing operational and construction noise studies and evaluating noise abatement options. Under 23 CFR 772, projects are categorized as Type I or Type II projects. Type I projects are defined as proposed federal or federal-aid highway improvements for the construction of a highway on new location; or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment, or increases the number of through-traffic lanes. The FHWA identifies Type I projects as improvements that will create a completely new noise source, increase the volume or speed of traffic, or move the traffic closer to a receiver. Type I projects include the addition of an interchange, ramp, auxiliary lane, or truck-climbing lane to an existing highway, or the widening of an existing ramp by a full lane for its entire length. As the Build Alternative involves the construction of a new lane on I-680 in the northbound direction, as well as auxiliary lanes and ramp improvements, it is considered a Type I project. The FHWA noise regulations require noise analyses for all Type I projects.

Future (2040) traffic noise conditions under the Build and No-Build Alternatives were modeled for the identified noise sensitive land uses illustrated in **Appendix H**. **Table 2.2.7-2** through **Table 2.2.7-11** present the existing and future modeled noise levels for these land uses (receptors). Noise sensitive receivers are grouped together by segments, described previously, and are listed consecutively. The noise-sensitive receptors in the study area are mainly defined as Activity Category B and C land uses, which have an NAC threshold of 67 dBA. There are some Activity Category D and E land uses, the NAC threshold for which is 52 dBA and 72 dBA, respectively. Noise levels predicted to approach or exceed the NAC are considered unacceptable noise conditions for these land uses.

With the exception of Segment 7, where existing noise barriers would be demolished as part of the Build Alternative to accommodate the widened highway alignment, noise increases under the 2040 Build conditions generally range from 0 to 1 dBA, which is not considered a substantial increase in noise. A substantial noise level increase of 15 dB would occur at one location within Segment 7, where portions of the existing 8 to 14-foot high barrier would be removed under the Build Alternative. All of the noise study area segments would experience noise levels that approach or exceed the NAC under the 2040 Build conditions, requiring consideration of noise abatement.

Segment 1 – Chewpon Avenue to East Calaveras Boulevard (SR 237)

Under the 2040 No-Build and 2040 Build conditions, noise levels within Segment 1 of the noise study area would not change from existing conditions, as the roadway geometry within this segment would not change under the Build Alternative. Anticipated traffic volumes during the peak-hour would continue to exceed free-flowing traffic conditions.

Existing, 2040 No-Build, and 2040 Build noise levels are calculated to approach or exceed the NAC at single-family residences located east of I-680 between Chewpon Avenue and Mt. Shasta Avenue (ST-2), and between Edsel Drive and Calaveras Boulevard (ST-7, ST-8, and R-8a). Noise abatement in the form of new soundwalls was considered.

Segment 2 – East Calaveras Boulevard (SR 237) to Jacklin Road

Segment 2 worst-hour noise levels range from 62 to 68 dBA under Existing and 2040 No-Build conditions, and would slightly increase to 63 to 69 dBA under 2040 Build conditions. The one-decibel noise level increase is not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at some first row residences east of I-680 between Calaveras Boulevard and Jacklin Road (ST-14, ST-15, ST-20, and R-18a). These residences are shielded by an existing 12-foot high wall (NB Wall 1). Noise abatement in the form of a replacement soundwall was considered for impacted receptors.

Segment 3 – Jacklin Road to Scott Creek Road

Segment 3 worst-hour noise levels range from 55 to 69 dBA under Existing and 2040 No-Build conditions, and would slightly increase to 55 to 70 dBA under 2040 Build conditions. The one-decibel noise level increase is not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at the Golfland Miniature Golf Course (R-25b), and residences located east of I-680 between the Golfland Miniature Golf Course and Ann Place (ST-27, ST-30, and R-25a). Impacted residences are shielded by an existing 10-foot high wall (NB Wall 3). Golfland Miniature Golf Course is not currently shielded by a noise barrier. Noise abatement in the form of new and replacement soundwalls was considered for impacted receptors.

Table 2.2.7-2 Modeled Noise Levels – Segment 1

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-1	1331 David Lane	68	68	68	0	0	Reference Only	--
ST-2	Dempsey Rd at Chewpon Ave	68	68	68	0	0	B(67)	A/E
ST-3	1361 Mt Shasta Ave	63	63	63	0	0	B(67)	None
ST-4	1249 Methven Lane	64	64	64	0	0	B(67)	None
ST-5	Crossroads Condo; Dempsey Rd	72	72	72	0	0	Calibration Point	--
R-5a	--	55	55	55	0	0	B(67)	None
ST-6	496 Dempsey Rd	64	64	64	0	0	B(67)	None
ST-7	1106 Edsel Dr	69	69	69	0	0	B(67)	A/E
ST-8	1105 Shirley Dr	68	68	68	0	0	B(67)	A/E
R-8a	--	66	66	66	0	0	B(67)	A/E
ST-9	800 Cameron Cir	64	64	64	0	0	B(67)	None
ST-10	Executive Inn	68	68	68	0	0	E(72)	None

Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.

Source: Caltrans, 2014i

Table 2.2.7-3 Modeled Noise Levels – Segment 2

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-11	109 Ayer Ln	62	63	63	1	1	B(67)	None
ST-12	169 Ayer Ln	65	65	65	0	0	B(67)	None
ST-13	245 N Hillview Dr	62	63	63	1	1	B(67)	None
ST-14	267 Moretti Ln	66	66	67	0	1	B(67)	A/E
ST-15	353 Moretti Ln	68	68	69	0	1	B(67)	A/E
ST-16	909 Las Lomas Dr	63	63	64	0	1	B(67)	None
ST-17	928 Canada Dr	63	63	63	0	0	B(67)	None
ST-18	Church of Christ parking lot	64	64	64	0	0	C(67)	None
R-18a	570 North Hillview Dr	66	66	66	0	0	B(67)	A/E
ST-19	618 Wool Dr	64	64	64	0	0	B(67)	None
ST-20	941 Del Rio Ct	67	67	67	0	0	B(67)	A/E
ST-21	1122 Traughber St	62	62	62	0	0	B(67)	None
ST-22	1133 Calle Oriente	62	62	63	0	1	B(67)	None
ST-23	109 Ayer Ln	64	64	64	0	0	B(67)	None
LT-3	Extended Stay America Hotel	65	66	66	1	1	E(72)	None

Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.

Source: Caltrans, 2014i

Table 2.2.7-4 Modeled Noise Levels – Segment 3

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-24	948 La Palma Pl	60	61	61	1	1	B(67)	None
ST-25	Golf Land	69	69	70	0	1	Calibration Point	--
R-25a	--	66	66	67	0	1	B(67)	A/E
R-25b	--	69	69	70	0	1	C(67)	A/E
ST-26	1073 Horcajo Cir	61	62	62	1	1	B(67)	None
ST-27	1185 Nicklaus Ave	66	66	67	0	1	B(67)	A/E
ST-28	1288 N Hillview Dr	61	62	62	1	1	B(67)	None
ST-29	888 Founders Ln	58	58	58	0	0	B(67)	None
ST-30	666 Princess Pl	69	69	70	0	1	B(67)	A/E
ST-31	1486 N. Hillview Dr	59	59	59	0	0	B(67)	None
ST-32	674 Canterbury Pl	65	65	65	0	0	B(67)	None
ST-33	Jose Higuera Adobe Park	65	65	65	0	0	B(67)	None
ST-34	546 Greathouse Dr	55	55	55	0	0	B(67)	None
R-34a	--	65	65	65	0	0	B(67)	None
ST-35	681 Berkshire Pl	64	64	65	0	1	B(67)	None
ST-36	513 Greathouse Dr	62	62	63	0	1	B(67)	None
ST-37	2078 North Park	64	64	64	0	0	B(67)	None

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
	Victoria							
ST-38	484 Oliver St	61	61	62	0	1	B(67)	None
ST-39	2242 Levin St	61	61	62	0	1	B(67)	None
R-39a	--	67	67	68	0	1	F	None
ST-40	1452 San Benito Dr	64	64	65	0	1	B(67)	None

Notes:
1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.

Source: Caltrans, 2014i

Segment 4 – Scott Creek Road to Mission Boulevard (SR 262)

Segment 4 worst-hour noise levels range from 53 to 68 dBA under Existing and 2040 No-Build conditions, and slightly increase to 54 to 69 dBA under 2040 Build conditions. The one-decibel noise level increase is not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at some first row residences west of I-680 along the southbound off-ramp to Scott Creek Road (ST-42 and R-43b) and residences east of I-680 to the north and south of Warren Avenue (ST-57 and ST-61). These residences are not shielded by existing walls. Noise abatement in the form of new soundwalls was considered for the impacted receptors.

Segment 5 – Mission Boulevard (SR 262) to Auto Mall Parkway/Durham Road

Segment 5 worst-hour noise levels range from 60 to 72 dBA under Existing, and from 60 to 73 dBA under 2040 No-Build conditions. Noise levels are predicted to slightly increase to 61 to 73 dBA under 2040 Build conditions. The one-decibel noise level increase is not considered substantial. Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at some first row residences located east of I-680 throughout this segment (ST-69, ST-70, ST-71, ST-72, ST-74, R-71a, and R-71b). Impacted residences are shielded by existing 12 to 16-foot high walls (NB Walls 8 and 9). Therefore, noise abatement was not considered for residences shielded by this wall (ST-69, ST-70, and ST-71). Noise abatement in the form of a replacement soundwall for NB Wall 9 and a new soundwall to close the gap across the Grimmer Boulevard overpass were considered.

Table 2.2.7-5 Modeled Noise Levels – Segment 4

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-41	Green Valley Road; Mormon Temple	65	65	65	0	0	B(67)	None
ST-42	48896 Cabernet Way	67	67	67	0	0	B(67)	A/E
ST-43	659 Merlot Dr	54	54	55	0	1	B(67)	None
R-43a	--	64	64	64	0	0	B(67)	None
R-43b	--	67	67	67	0	0	B(67)	A/E
ST-44	685 Rattan Ct	55	55	55	0	0	B(67)	None
ST-45	680 Plomosa Ct	57	57	57	0	0	B(67)	None
ST-46	48254 Arcadian St	61	61	61	0	0	B(67)	None
ST-47	48197 Alta Vista Terrace	63	63	64	0	1	B(67)	None
ST-48	48149 Alta Vista Terrace	58	58	58	0	0	B(67)	None
ST-49	1000 Gable Dr	59	59	59	0	0	B(67)	None
ST-50	47618 Wabana Common	54	54	55	0	1	B(67)	None
ST-51	47859 Gable Dr	62	63	63	1	1	B(67)	None
ST-52	47468 Cholla St	62	62	63	0	1	B(67)	None
ST-53	47461 Cholla St	59	59	59	0	0	B(67)	None

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-54	47426 Cholla St	61	61	62	0	1	B(67)	None
ST-55	470 Yucatan Ct	57	57	58	0	1	B(67)	None
ST-56	End of Omaha Rd	53	53	54	0	1	B(67)	None
ST-57	46995 Ocotillo Ct	67	67	67	0	0	B(67)	A/E
ST-58	760 Navajo Way	59	59	59	0	0	B(67)	None
ST-59	46944 Crawford St	56	56	57	0	1	B(67)	None
ST-60	46509 Bradley Ct	57	57	58	0	1	B(67)	None
R-60a	--	58	58	59	0	1	B(67)	None
ST-61	46443 & 46442 Briar Place	68	68	69	0	1	B(67)	A/E
ST-62	Extended Stay America	60	60	61	0	1	E(72)	None
ST-63	130 Mary Beth Ct	60	60	61	0	1	B(67)	None
LT-4	Church of Latterday Saints, Greenville Rd.	64	64	65	0	1	C(67)	None

Notes: 1) Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
Source: Caltrans, 2014i

Table 2.2.7-6 Modeled Noise Levels – Segment 5

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-64	536 Crystalline Plc	64	64	64	0	0	B(67)	None
ST-65	46101 Research Ave	64	64	64	0	0	E(72)	None
ST-66	45661 Parkmeadow Ct	65	65	65	0	0	B(67)	None
ST-67	45550 Parkmeadow Ct	64	64	64	0	0	B(67)	None
ST-68	45443 Parkmeadow Ct	64	65	65	1	1	B(67)	None
ST-69	1473 Deschutes Plc	69	69	69	0	0	B(67)	A/E
ST-70	1795 & 1775 Ponca Ct	65	65	66	0	1	B(67)	A/E
ST-71	1966 Mandan Ct	70	70	70	0	0	B(67)	A/E
R-71a	--	72	73	73	1	1	B(67)	A/E
R-71b	--	70	71	71	1	1	B(67)	A/E
ST-72	44849 Camellia Dr	67	67	67	0	0	B(67)	A/E
ST-73	44762 Camellia Dr	64	64	64	0	0	B(67)	None
ST-74	44595 Camellia Dr	66	66	67	0	1	B(67)	A/E
ST-75	44043 Monet Terrace	60	60	61	1	1	B(67)	None
LT-7	44183 Pomace St	64	64	64	0	0	B(67)	None

Notes: 1) Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
Source: Caltrans, 2014i

Segment 6 – Auto Mall Parkway/Durham Road to Washington Boulevard (Phase 1)

Segment 6 worst-hour noise levels range from 52 to 79 dBA under Existing, 2040 No-Build conditions, and under 2040 Build conditions, although they increase slightly by one decibel in certain locations in the segment under the 2040 Build conditions. The one-decibel noise level increase is not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at some first row residences east of I-680 and south of Washington Boulevard (ST-83 and R-80a). These residences are substantially elevated above I-680. Residences along Sabercat Road (R- 80a) are not currently shielded by existing walls and residences along Castillejo Way (ST-83) are shielded by existing walls that are less than 8 feet high. Noise abatement in the form of new and replacement soundwalls was considered.

Under the 2040 Build conditions, noise levels at the exterior of the Fremont Assembly Church are predicted to be 68 dBA Leq[h]. There are no exterior areas of frequent human use at this receptor; therefore, the applicable noise abatement criterion would be 52 dBA (Activity Category D). Based on typical building construction with windows closed, noise levels inside the church would typically be 20 to 25 dB lower than exterior levels. As a result, interior noise levels would not exceed 52 dBA. Therefore, the church is not impacted, as noise levels do not approach or exceed the NAC.

Segment 7 – Washington Boulevard to Mission Boulevard (SR 238) (Phase 1)

Segment 7 worst-hour noise levels range from 54 to 75 dBA under Existing and 2040 No-Build conditions, and would generally increase to 55 to 80 dBA under 2040 Build conditions. A substantial noise level increase of 15 dB would occur at receiver ST-92, where portions of the existing 8 to 14-foot high barrier would be removed under the Build Alternative.

Under 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at the first row residences west of I-680 between the Washington Boulevard off-ramp and Paseo Padre Parkway (ST-87 and R-87a), and at residences located east of I-680 between Palm Avenue and Mission Boulevard, where portions of the existing barrier are proposed to be removed (ST-91, ST-92, ST-93, ST-94, and ST-95). Residences west of I-680 between the Washington Boulevard off-ramp and Paseo Padre Parkway are shielded by an existing 9-foot high wall (SB Wall 7). Portions of the existing 14-foot high barrier located east of I-680 between Palm Avenue and Mission Boulevard (NB Wall 13) would be removed with construction of the Build Alternative. However, even with the removal of this wall, many of the receptors would continue to be located behind 11 to 12 foot-high developer walls. Noise abatement in the form of new and replacement soundwalls was considered.

Table 2.2.7-7 Modeled Noise Levels – Segment 6

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-76	43500 Homestead Ct	63	63	64	0	1	B(67)	None
ST-77	43154 Osgood Rd	63	63	63	0	0	C(67)	None
ST-78	Fremont CA Assembly Church	48[2]	48[2]	48[2]	0	0	D(52)	None
ST-79	42986 Osgood Rd	64	64	64	0	0	B(67)	None
ST-80	Sabercat Rd	79	79	79	0	0	Calibration Point	--
R-80a	--	67	67	68	0	1	B(67)	A/E
R-80b	--	66	66	66	0	0	B(67)	A/E
ST-81	2543 Middlefield Ave	52	52	52	0	0	B(67)	None
ST-82	2468 Middlefield Ave	57	57	57	0	0	B(67)	None
ST-83	2249 Castillejo Way	67	67	67	0	0	B(67)	A/E
LT-8	2357 Castillejo Way	63	63	63	0	0	B(67)	None

Notes:
1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
2. Predicted interior noise level assumes 20 dBA of attenuation would be provided by the building

Source: Caltrans, 2014i

Table 2.2.7-8 Modeled Noise Levels – Segment 7

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-84	2164 Jackson St	61	61	62	0	1	B(67)	None
ST-85	42398 Barbary St	54	54	55	0	1	B(67)	None
ST-86	42718 Weigand Ct	64	64	65	0	1	B(67)	None
ST-87	42473 Paseo Padre	75	75	75	0	0	B(67)	A/E
R-87a	--	67	67	67	0	0	B(67)	A/E
ST-88	1320 Olive Ave	58	58	58	0	0	B(67)	None
ST-89	1005 Vuelta Olivos	64	64	65	0	1	B(67)	None
ST-90	42445 Palm Ave	65	65	65	0	0	B(67)	None
ST-91	898 & 892 Olive Ave	66	66	67	0	1	B(67)	A/E
ST-92	42970 Nido Ct	65	65	80	0	15	B(67)	S, A/E
ST-93	42601 Scofield Dr	65	65	68	0	3	B(67)	A/E
ST-94	42624 Scofield Dr	65	65	68	0	3	B(67)	A/E
ST-95	247 Montevideo Cir	63	63	67	0	4	B(67)	A/E
ST-96	20 Via San Dimas	56	57	57	1	1	B(67)	None

Notes:
1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.

Source: Caltrans, 2014i

Segment 8 – Mission Boulevard (SR 238) to Vargas Road (Phase 1)

Segment 8 worst-hour noise levels range from 55 to 73 dBA under Existing, 2040 No-Build conditions, and under 2040 Build conditions, although they increase slightly by one decibel in certain locations in the segment under the 2040 Build conditions. The one-decibel noise level increase is not considered substantial.

The 2040 Build noise levels are predicted to approach or exceed the NAC at some residences along Vargas Road, east of I-680 (R-LT10a). These residences are located at elevations below I-680 and are not shielded by existing walls. Noise abatement in the form of a new soundwall was considered.

Table 2.2.7-9 Modeled Noise Levels – Segment 8

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-97	915 Mission Rd	65	65	66	0	1	Calibration Point	--
R-97a	--	63	63	64	0	1	B(67)	None
R-97b	--	61	61	61	0	0	B(67)	None
R-97c	--	55	55	55	0	0	B(67)	None
LT-9	189 Mission Rd	73	73	73	0	0	Calibration Point	--
R-LT9a	--	64	64	64	0	0	B(67)	None
LT-10	42100 Vargas Rd	70	70	70	0	0	Calibration Point	--
R-LT10a	--	70	70	70	0	0	B(67)	A/E

Notes:
1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.

Source: Caltrans, 2014i

Segment 9 – Vargas Road to Andrade Road (Phase 1)

Segment 9 worst-hour noise levels range from 60 to 71 dBA under Existing and under 2040 No-Build conditions, and slightly increase to 61 to 71 dBA under 2040 Build conditions. The one-decibel noise level increase is not considered substantial.

The 2040 Build noise levels are predicted to approach or exceed the NAC at some Activity Category B and C land uses located west of I-680 and south of Andrade Road, including residences (R-99b and R-101a) and portions of the Sunol Valley Golf Course (ST-101). Noise abatement in the form of new soundwalls was considered.

Segment 10 – Andrade Road to Vallecitos Road (SR 84)

Segment 10 worst-hour noise levels range from 64 to 80 dBA under Existing and 2040 No-Build conditions, and slightly increase to 65 to 80 dBA under 2040 Build conditions. The one-decibel noise level increase is not considered substantial.

The 2040 Build noise levels are predicted to approach or exceed the NAC at the Sunol Valley Golf Course (ST-103 and R-103a) and at low-density single-family residences located east of I-680 along Athenour Way (R-105c). Noise abatement in the form of new noise barriers was considered.

Table 2.2.7-10 Modeled Noise Levels – Segment 9

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-98	41888 Vargas Rd	61	61	61	0	0	Calibration Point	--
R-98a	--	61	61	61	0	0	B(67)	None
R-98b	--	60	60	61	0	1	B(67)	None
ST-99	5815 Mission Rd	62	62	63	0	1	Calibration Point	--
R-99a	--	64	64	64	0	0	C(67)	None
R-99b	--	69	69	69	0	0	B(67)	A/E
ST-100	5987 Mission Rd	65	65	65	0	0	B(67)	None
ST-101	Adjacent to Mission Rd, near golf course	67	67	67	0	0	C(67)	A/E
R-101a	--	71	71	71	0	0	B(67)	A/E
ST-102	6467 Mission Rd	69	69	69	0	0	Calibration Point	--

Notes:
1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.

Source: Caltrans, 2014i

Temporary Construction Impacts

Noise levels generated by construction activities associated with the Build Alternative would be a function of the individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration of construction activities, the proximity of nearby sensitive land uses, and the presence or lack of shielding at these sensitive land uses. Construction noise levels would vary on a day-to-day basis during each phase of construction depending on the specific task being completed. Each construction phase would require a different combination of construction equipment necessary to complete the task and differing usage factors for such equipment.

Table 2.2.7-11 Modeled Noise Levels – Segment 10

Receptor ID	Location	Worst-Hour Noise Levels, dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact[1]
		Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-103	16th tee of Sunol Valley Golf Course	73	73	73	0	0	C(67)	A/E
R-103a	--	77	77	77	0	0	C(67)	A/E
ST-104	3000 Andrade Rd	64	64	65	0	1	C(67)	None
ST-105	7587 Athenour Way	80	80	80	0	0	Calibration Point	--
R-105a	--	73	73	74	0	1	F	None
R-105b	--	74	74	76	0	2	F	None
R-105c	--	70	70	71	0	1	B(67)	A/E
LT-11	3001 Andrade Rd	73	73	74	0	1	Calibration Point	--

Notes:
1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.

Source: Caltrans, 2014i

Construction activities anticipated under the Build Alternative would include earthwork demolition, the installation of utilities, construction of noise barriers that are found to be feasible and reasonable, paving, and the installation of overhead signs and electrical/communication facilities. The majority of construction activities south of Auto Mall Parkway would occur in the median of I-680, a minimum of approximately 75 feet from the edge of the I-680 right-of-way. North of Auto Mall Parkway, the majority of construction would be conducted on the outside of existing travel lanes near the northbound right-of-way. The majority of Activity Category B land uses (residences) located adjacent to I-680 are shielded by existing noise barriers typically ranging from 10 to 16 feet in height. These existing noise barriers provide a minimum 10 dBA reduction in construction noise levels for the land uses on the opposite side of the barrier.

Table 2.2.7-12 presents the noise levels calculated at 100 feet for each major construction activity that would be associated with the Build Alternative. Noise generated by construction equipment drops off at a rate of 6 dB per doubling of distance.

Table 2.2.7-12 Construction Equipment Noise Levels at 100 feet

Construction Phase	Maximum Noise Level ($L_{max,}$ dBA)	Average Hourly Noise Levels ($L_{eq[h]}$, dBA)
Demolition	84	78
Earthwork	76	78
Paving	79	79
Structures (with Pile Driving)	95	89
Structures (without Pile Driving)	77	78

Source: Caltrans, 2014i

Phase 1 – Initial Construction Phase

Segments 6 through 10 of the noise study area are located within Phase 1. Refer to the discussions above for a summary of the anticipated noise increases with Phase 1.

No-Build Alternative

Under the 2040 No-Build conditions, noise levels are anticipated to be almost equal to existing conditions in most locations, with a slight increase of 1 dBA for some areas. These changes are not considered a substantial increase in noise (defined as 12 dBA or more increase). Many locations would experience noise levels approaching or exceeding the NAC under both the 2040 Build and No-Build conditions. The No-Build Alternative would make no physical or operational improvements to I-680, nearby roadways, or interchanges; therefore, noise abatement for those areas already approaching or exceeding the NAC thresholds would not be considered for this alternative. Implementation of the currently planned and approved transportation and land use projects within the noise study area would be subject to the same noise assessment as the Build Alternative. These projects would be required to comply with the local operation and construction guidelines regarding noise impacts, which would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/ OR MITIGATION MEASURES

Receptors that would experience a substantial noise increase (greater than 12 dBA) or exceed NAC thresholds 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 receiver to be considered feasible by Caltrans (i.e., the barrier would provide a noticeable noise reduction). Additionally, Caltrans acoustical design goal for noise abatement is that noise abatement must be predicted to 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 dB are encouraged as long as they meet the reasonableness guidelines. Furthermore, under Caltrans' policies, noise barriers should interrupt the line of sight between a truck stack (assumed to be 11.5 feet high) and a receiver (assumed to be 5 feet above ground).

Potential noise abatement measures identified in Caltrans' protocol include:

- avoiding the project impact by using design alternatives, such as altering the horizontal and vertical alignment of the project
- constructing noise barriers
- using traffic management measures to regulate types of vehicles and speeds
- acquiring property to serve as a buffer zone
- acoustically insulating Activity Category D land uses

The chosen abatement type for this Build Alternative would be the construction of noise barriers. A preliminary noise abatement analysis was conducted that identified the feasibility of constructing, replacing, or increasing the height of existing noise barriers to reduce traffic noise levels. If, during final design, conditions substantially change from what was evaluated in this environmental document, noise barriers might not be provided.

The views and opinions of the residents living immediately adjacent to the proposed improvements and affected by the traffic noise would be considered in reaching a decision on noise abatement measures. Caltrans' policy is to not provide noise barriers if 50 percent or more of those affected residents do not want them. The opinions of these residents would be obtained through public and community meetings or other means, as appropriate. The final decision regarding noise abatement would be made upon completion of the Build Alternative design and public involvement processes.

Noise Abatement Decision Report

A Noise Abatement Decision Report (NADR) was completed for the project using NEPA-23 CFR 772 and Caltrans' protocol, which requires that noise abatement be considered for projects that are predicted to result in traffic noise impacts. The NADR analysis was incorporated into the Draft Project Report (Caltrans, 2014c).

Caltrans' protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. Before publication of the draft environmental document, a preliminary noise abatement decision is made. The preliminary noise abatement decision is based on the feasibility of evaluated abatement and the preliminary reasonableness determination. NEPA-23 CFR 772 requires that noise abatement measures that are reasonable and feasible and are likely to be incorporated into the project be identified before adoption of the final environmental document.

To determine whether a proposed barrier is reasonable, the total reasonable allowance for that barrier must be greater or equal to the cost of the barrier. To calculate the reasonable allowance for a noise barrier, the total number of benefitted receptors is multiplied by the reasonable cost allowance ($55,000) for noise abatement per benefited receptor. A benefited receptor is any receptor receiving a minimum of a 5-dBA reduction in noise levels from the proposed barrier.

At the end of the public review process for the environmental document, the final noise abatement decision is made and is indicated in the final environmental document. The preliminary noise abatement decision will become the final noise abatement decision unless compelling information received during the environmental review process indicates that it should be changed.

Noise Barriers

A total of 23 potential noise barriers were evaluated for feasibility where the NAC would be approached or exceeded (see **Appendix H**). Approximately 15 of the 23 barriers were found to be feasible, however, only 12 of them were found to be both feasible and achieve the Caltrans noise reduction design goal (minimum 7 dBA reduction for at least one receptor), which is a reasonableness consideration. The total reasonable allowance for each feasible barrier that met the Caltrans noise reduction design goal ranged from $55,000 to $605,000 depending on the number of benefited receptors.

Proposed noise barriers determined to be acoustically feasible and meet the 7 dB noise reduction design goal, and associated affected receiver locations, are depicted in **Appendix H**. All 12 noise barriers determined to be acoustically feasible and to meet the 7 dB noise reduction design goal are more costly than the reasonable allowance. However, replacement noise barrier NB Wall 13 is likely to be constructed, as it would replace an existing barrier directly removed by the proposed improvements, and would avoid a substantial noise impact. The discussions below provide a summary of the acoustical feasibility and reasonable allowance of each soundwall.

Mitigation Measure NOI-A: Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of a replacement noise barrier (NB Wall 13), located along northbound I-680, between Palm Avenue and Mission Boulevard. Replacement barrier NB Wall 13 would replace portions of the existing soundwall that would be removed under the Build Alternative, with an equivalent height of 14 feet. Calculations based on preliminary design data indicate that the barrier will reduce noise levels by 14 to15 dBA for ten residences at a cost of $1,675,680. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision of the noise abatement will be made upon completion of the project design and the public involvement processes.

Segment 1 – Chewpon Avenue to East Calaveras Boulevard

Three new barriers, SWA, SWB, and SWC, were assessed to abate noise impacts at residences located east of I-680 between Chewpon Avenue and Mt. Shasta Avenue (ST- 2), and between Edsel Drive and Calaveras Boulevard (ST-7, ST-8, and R-8a). These residences have been identified for noise abatement because 2040 Build noise levels exceed the NAC, and the residences are not shielded by an existing noise barrier. **Table 2.2.7-13** presents the noise abatement analysis summary for feasible walls within Segment 1 of the noise study area.

Barrier SWA

Barrier SWA would be located along the northbound I-680 edge right-of-way, between Mt. Shasta Avenue and the storage facility buildings located south of Chewpon Avenue. The height of the modeled noise barrier varies between 8 feet and 16 feet tall. The length of the barrier is approximately 750 feet. This wall would feasibly abate traffic noise at these residences and would meet the 7 dB noise reduction goal at a minimum height of 12 feet. Barrier SWA breaks the line-of-sight between truck stacks and receptors at a height of 8 feet. Therefore, Barrier SWA is acoustically feasible.

The reasonableness allowance calculated for Barrier SWA is $440,000. The estimated construction cost of a 12-to 16-foot noise barrier is between $441,000 and $598,000. The construction cost of Barrier SWA is therefore above the calculated reasonable allowance. In addition, since the actual limit of the freeway widening does not extend as far as the proposed limits of this noise barrier, Barrier SWA is not anticipated to be incorporated into the Build Alternative.

Barrier SWB

Noise barrier SWB would be located along the northbound I-680 right-of-way, from south of Edsel Drive to the Calaveras Boulevard off-ramp. The height of the modeled noise barrier varies between 8 feet and 16 feet tall. The length of the barrier is approximately 1,780 feet. This wall would feasibly abate traffic noise at these residences and would meet the 7 dB noise reduction goal at a minimum height of 14 feet. Barrier SWB breaks the line-of-sight between truck stacks and receptors at a height of 14 feet. Therefore, Barrier SWB is acoustically feasible.

The reasonableness allowance calculated for Barrier SWB is $605,000. The estimated construction cost of a 14 to 16 foot noise barrier is between $1,350, 000 to $1,575,000. Because the cost of the barriers is more than the reasonable allowance, noise barrier SWB is not anticipated to be incorporated into the Build Alternative.

Barrier SWC (with SWB)

The noise barrier SWC is proposed at the edge of shoulder of northbound I-680, between Calaveras Boulevard and the beginning of the off-ramp. The length of the barrier is 920 feet. The addition of Barrier SWC to SWB would feasibly abate traffic noise at two additional residences along the Calaveras Boulevard off-ramp, and would meet the 7 dB noise reduction goal at a minimum height of 16 feet. Barrier SWC would also break the line-of-sight between truck stacks and receptors at a minimum height of 16 feet.

The estimated construction cost of Barrier SWC is approximately $880,000, eight times the reasonable allowance cost of $110,000. Because the cost of the barrier is more than the reasonable allowance, noise barrier SWC (with SWB) is not anticipated to be incorporated into the Build Alternative.

Segment 2 – East Calaveras Boulevard to Jacklin Road

Height increases were assessed for the existing 12-to 15-foot barrier (NB Wall 1) located along northbound I-680 between Calaveras Boulevard and Jacklin Road to abate noise impacts at residences east of I-680 between Calaveras Boulevard and Jacklin Road (ST-14, ST-15, ST-20, and R-18a). Increasing the height of this barrier would not be considered feasible because only a maximum of 3 dB of additional noise reduction can be achieved.

Table 2.2.7-13 Noise Abatement Summary – Segment 1

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SWA	12	Yes	8	$ 440,000	$ 441,130	No
	14	Yes	8	$ 440,000	$ 510,655	No
	16	Yes	8	$ 440,000	$597,730	No
SWB	14	Yes	11	$ 605,000	$1,346,570	No
	16	Yes	11	$ 605,000	$1,576,190	No
SWC (With SWB)	16	Yes	2	$ 110,000	$882,234	No

Source: Caltrans, 2014g

Segment 3 – Jacklin Road to Scott Creek Road

Noise abatement in the form of new and replacement soundwalls was considered to abate noise impacts at Golfland Miniature Golf Course (R-25b), and residences located east of I-680 between the miniature golf course and Ann Place (ST-27, ST-30, and R- 25a). **Table 2.2.7-14** presents the noise abatement analysis summary for feasible barriers within Segment 3 of the noise study area.

<u>Barrier SW1</u>

Barrier SW1 would be located at the miniature golf course's property line, with a proposed length of approximately 450 feet. The height of the modeled noise barrier varies between 8 feet and 16-feet-tall. This wall would feasibly abate traffic noise at the miniature golf course, and would meet the 7 dB noise reduction goal at a minimum height of 10 feet. Barrier SW1 would also break the line-of-sight between truck stacks and receptors at a height of 10 feet.

The estimated construction cost of a 10- to 16-foot noise barrier at this location ranges from $250,000 to $395,000, which is approximately four times the reasonable cost allowance of $55,000.

Furthermore, the owners of the golf course may desire visibility of their business from the freeway, and may not be in support of a noise barrier. Therefore, noise barrier SW1 is not anticipated to be incorporated into the Build Alternative.

NB Wall 3

Wall height increases were assessed for the existing 10-foot high barrier located along northbound I-680, between Jacklin Road and Scott Creek Road (NB Wall 3). Increasing the height of this barrier would achieve the 7 dB noise reduction goal at any of the benefitted receptors.

Table 2.2.7-14 Noise Abatement Summary – Segment 3

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SW1	10	Yes	1	$ 55,000	$249,486	No
	12	Yes	1	$ 55,000	$294,291	No
	14	Yes	1	$ 55,000	$339,096	No
	16	Yes	1	$ 55,000	$395,211	No

Source: Caltrans, 2014g

Segment 4 – Scott Creek Road to Mission Boulevard

Noise abatement in the form of new soundwalls was considered to reduce noise levels at residences west of I-680 along the southbound off-ramp to Scott Creek Road (ST-42 and R-43b) and residences east of I-680 to the north and south of Warren Avenue (ST-57 and ST-61). These residences have been identified for noise abatement because 2040 Build noise levels exceed the NAC and the residences are not shielded by an existing noise barrier. **Table 2.2.7-15** presents the noise abatement analysis summary for feasible barriers within Segment 4 of the noise study area.

Barrier SW2

Two options analyzed for Barrier SW2; one at the southbound I-680 edge of shoulder (SW2a), and one along the right-of-way line and property line of the residences (SW2b). The noise barriers analyzed under options SW2a or SW2b would not achieve the 7dB noise reduction goal at any of the benefitted receptors.

Barrier SW3

Barrier SW3 would be located along the eastern side of I-680 and south of Paseo Padre Parkway. Two options were analyzed for Barrier SW3; one at the northbound I-680 edge of shoulder (SW3a), and one along the property line of the residences (SW3b), which are elevated by about 80 feet above the highway. Due to the elevations of the residences above the freeway, the noise barrier adjacent to the highway (SW3a) was found to only reduce noise levels by 0 to 2 dB, and would not be considered acoustically feasible.

Barrier SW3b would be approximately 1,010 feet in length. The height of the modeled noise barrier varies from 8 feet to 16-feet-tall. Noise Barrier SW3b would feasibly abate traffic noise levels at the elevated residences, and would meet the 7 dB noise reduction goal at a minimum height of 8 feet. Barrier SW3b also breaks the line-of-sight between truck stacks and receptors at a height of 8 feet.

The reasonableness allowance calculated for Barrier SW3b is $330,000. The estimated construction cost this noise barrier is between $630,000 to $990,000; almost twice the reasonable allowance. In addition, construction of Barrier SW3b may not be achievable due to the difficulty in accessing the extremely steep slope areas with equipment and materials. Therefore, noise barrier SW3b is not anticipated to be incorporated into the Build Alternative.

Barrier SW4

Barrier SW4 would be located at the property line of the residences just east of I-680, between Warren Avenue and Mission Boulevard (partially outside of the state right-of-way). Noise Barrier SW4 was found to only reduce noise levels by 0 to 1 dB and would not be considered feasible.

Table 2.2.7-15 Noise Abatement Summary – Segment 4

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SW3b	8	Yes	6	$330,000	$630,267	No
	10	Yes	6	$330,000	$688,443	No
	12	Yes	6	$330,000	$782,070	No
	14	Yes	6	$330,000	$875,697	No
	16	Yes	6	$330,000	$992,958	No

Source: Caltrans, 2014g

Segment 5 – Mission Boulevard to Auto Mall Parkway/Durham Road

Noise abatement in the form of new and replacement soundwalls was considered to reduce noise levels at residences located east of I-680 throughout this segment (ST-69, ST-70, ST-71, ST-72, ST-74, R-71a, and R-71b), because the 2040 Build noise levels would exceed the NAC. **Table 2.2.7-16** presents the noise abatement analysis summary for feasible barriers within Segment 5 of the noise study area.

Barrier SW5

Barrier SW5 would close the gap in the existing northbound I-680 noise barrier at the S. Grimmer Boulevard undercrossing. Barrier SW5 would be installed along the I-680 edge of shoulder and on the concrete barrier of the bridge structure. It would be approximately 400 feet in length. The height of the modeled noise barrier ranges from 8 to 16 feet. This wall would feasibly abate traffic noise at the two residences closest to I-680, and would meet the 7 dB noise reduction goal at a minimum height of 10 feet. Barrier SW5 would also break the line-of-sight between truck stacks and receptors at a minimum height of 10 feet.

The estimated construction cost of a 10- to 16-foot noise barrier in this location is between $200,000 and $260,000, almost twice the reasonable cost allowance of $110,000. Because the cost of the barrier is more than the reasonable allowance, Barrier SW5 is not anticipated to be incorporated into the Build Alternative.

NB Wall 9

Wall height increases were assessed for the existing 12- to 14-foot high barrier located along northbound I-680 between S. Grimmer Boulevard and Durham Road (NB Wall 9). Increasing the height of this wall would not be considered feasible.

Table 2.2.7-16 Noise Abatement Summary – Segment 5

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SW5	10	Yes	2	$110,000	$202,033	No
	12	Yes	2	$110,000	$221,753	No
	14	Yes	2	$110,000	$241,473	No
	16	Yes	2	$110,000	$261,193	No

Source: Caltrans, 2014g

Segment 6 – Auto Mall Parkway/Durham Road to Washington Boulevard (Phase 1)

Noise abatement in the form of new and replacement soundwalls was considered to reduce noise levels at the residences east of I-680 and south of Washington Boulevard (ST-83, R- 80a, and R-80b). These residences include the Sabercat Court residences, where the 2040 Build noise levels exceed the NAC and the residences are not shielded by an existing noise barrier; and the residences on Castillejo Way, where there is an existing 4- to 6-foot high barrier located at the residential property line. **Table 2.2.7-17** presents the noise abatement analysis summary for feasible barriers within Segment 6 of the noise study area.

<u>Barrier SW 6</u>

Two options were analyzed for SW6; one along the property line of the residences (SW6a) and one at the northbound I-680 edge of shoulder (SW6b). Because the residences are elevated approximately 200 feet above the freeway, SW6b was not found to be acoustically feasible or achieve the 7dB noise reduction goal at any of the benefitted receptors, even at a height of 16 feet.

Barrier SW6a would be approximately 1030 feet in length. The height of the modeled noise barrier varies from 8 to 16 feet. Barrier SW6a would feasibly abate traffic noise and meet the 7 dB noise reduction goal at a minimum height of 12 feet. SW6a would also break the line-of-sight between truck stacks and receptors at a height of 12 feet.

The estimated construction cost of a 12- to 16-foot noise barrier in this location ranges from $627,891 to $842,955, which is approximately three to four times more than the reasonable cost allowance of $220,000. Furthermore, construction of barrier SW6a may not be achievable due to the difficulty in accessing the steep slopes in the area with construction equipment and material. Therefore, barrier SW6a is not anticipated to be incorporated into the Build Alternative.

<u>NB Wall 11</u>

Wall height increases were assessed for the existing 4- to 6-foot-high noise barrier located at the property line of the residences on Castillejo Way (NB Wall 11). Increasing the height of this wall would not be considered acoustically feasible, and it would not achieve the 7dB noise reduction goal at any of the benefitted receptors.

Table 2.2.7-17 Noise Abatement Summary – Segment 6 (Phase 1)

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SW6a	12	Yes	4	$220,000	$627,891	No
	14	Yes	4	$220,000	$723,372	No
	16	Yes	4	$220,000	$842,955	No

Source: Caltrans, 2014g

Segment 7 – Washington Boulevard to Mission Boulevard (Phase 1)

Noise abatement in the form of new and replacement soundwalls was considered to reduce noise impacts at residences west of I-680, between the Washington Boulevard off-ramp and Paseo Padre Parkway (ST-87 and R-87a); and at residences located east of I-680 between Palm Avenue and Mission Boulevard, where portions of the existing barrier (NB Wall 13) would be removed under the Build Alternative (ST-91, ST-92, ST-93, ST-94, and ST-95). Removal of the existing noise barrier would increase traffic noise levels by 15 dBA for some residences. **Table 2.2.7-18** presents the noise abatement analysis summary for feasible barriers within Segment 7 of the noise study area.

<u>NB Wall 13</u>

Under the Build Alternative, a portion of the existing noise barrier (NB Wall 13) would be removed between Palm Avenue and Mission Boulevard to accommodate the proposed freeway widening for the project. The portion of the wall that would remain is 8 feet high. A replacement wall would be constructed on a proposed retaining wall along the widened edge of pavement. Replacing the existing barrier with a 14-foot-high wall would be considered feasible, and would meet the 7 dB noise reduction goal. A 14-foot-high barrier would also break the line-of-sight between truck stacks and receptors.

The reasonableness allowance calculated for the replacement NB Wall 13 is $550,000. The estimated construction cost of a 14 to 16 feet noise barrier in this location ranges from approximately $1,675,680 to $1,920,552. Although the construction costs are nearly triple the reasonable allowance, the Build Alternative would likely include the construction of this noise barrier, as it would be replacing an existing barrier directly removed by the proposed improvements, and would avoid a substantial noise impact from the project (increase in noise by 15 dBA).

<u>SB Wall 7</u>

Wall height increases were assessed for the existing 9-foot-high barrier (SB Wall 7) located at the property line adjacent to southbound I-680, south of Paseo Padre Parkway. Increasing the height of this barrier would not be considered acoustically feasible, and it would not achieve the 7dB reduction goal at any of the benefitted receptors.

Table 2.2.7-18 Noise Abatement Summary – Segment 7 (Phase 1)

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
NB Wall 13	14	Yes	10	$550,000	$1,675,680	Yes
	16	Yes	10	$550,000	$1,920,552	No

Source: Caltrans, 2014g

Segment 8 – Mission Boulevard to Vargas Road (Phase 1)

Noise abatement in the form of a new soundwall was considered to reduce noise levels at residences along Vargas Road, east of I-680 (R-LT10a). **Table 2.2.7-19** presents the noise abatement analysis summary for feasible barriers within Segment 8 of the noise study area.

Barrier SW7

Barrier SW7 would be located adjacent to three rural residences along Vargas Road, east of I-680. The residences are located at elevations ranging from 0 to 30 feet below the elevation of the freeway. Barrier SW7 would be approximately 1,230 feet in length. The height of the modeled noise barrier varies from 8 to 16 feet high. Barrier SW7 would feasibly abate traffic noise and would meet the 7 dB noise reduction goal at the modeled height of 16 feet. Barrier SW7 would also break the line-of-sight between truck stacks and receptors at a height of 16 feet.

The estimated construction cost of a barrier in this location is approximately $1,530,000, which is nearly 9 times more that the reasonable cost allowance of $165,000. Therefore, noise barrier SW7 is not anticipated to be incorporated into the Build Alternative.

Table 2.2.7-19 Noise Abatement Summary – Segment 8 (Phase 1)

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SW7	16	Yes	3	$165,000	$1,530,341	No

Source: Caltrans, 2014g

Segment 9 – Vargas Road to Andrade Road (Phase 1)

Noise abatement in the form of new soundwalls was considered to reduce noise levels at residences (R-99b and R-101a) and portions of the Sunol Valley Golf Course (ST-101) located west of I-680 and south of Andrade Road. **Table 2.2.7-20** presents the noise abatement analysis summary for feasible barriers within Segment 9 of the noise study area.

Barrier SW8

Barrier SW8 would be located at the edge of shoulder of southbound I-680 for an approximate length of 615 feet. This barrier was not found to be acoustically feasible or achieve the 7dB noise reduction goal at any of the receptors.

Barrier SW9

Barrier SW9 would be located along Mission Road, adjacent to southbound I-680 and south of Andrade Road. This area consists of mixed industrial, commercial, and residential uses as well as the Sunol Valley Golf Course. Industrial structures along the freeway shield some portions of this area. Barrier SW9 would be approximately 1,080 feet in length. The height of the modeled noise barrier varies from 8 to 16 feet high. This wall would feasibly abate traffic noise for three residences and meet the 7 dB noise reduction goal at a minimum height of 12 feet. Barrier SW9 would also break the line-of-sight between truck stacks and receptors at a height of 14 feet.

The estimated construction cost of a of 12 to 16 foot noise barrier in this location would range from $930,186 to $1,189,098, which is approximately 6 to 7 times more than the reasonable cost allowance of $165,000. Therefore, Barrier SW9 is not anticipated to be incorporated into the Build Alternative.

Segment 10 – Andrade Road to State Route 84 (Phase 1)

Noise abatement in the form of new soundwalls was considered to reduce noise levels at the Sunol Valley Golf Course (ST-103 and R-103a) and at low-density single-family residences located east of I-680, along Athenour Way (R-105c). **Table 2.2.7-21** presents the noise abatement analysis summary for feasible barriers within Segment 10 of the noise study area.

Table 2.2.7-20 Noise Abatement Summary – Segment 9 (Phase 1)

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SW9	12	Yes	3	$165,000	$930,186	No
	14	Yes	3	$165,000	$1,045,134	No
	16	Yes	3	$165,000	$1,189,098	No

Source: Caltrans, 2014g

Barrier SW10

Barrier SW10 would be located adjacent to the Sunol Valley Golf Course, along the southbound I-680/Andrade Road off-ramp. Barrier SW10 would be approximately 2,250 feet in length. The height of the modeled noise barrier varies from 8 to 16-feet. Barrier SW10 would feasibly abate traffic noise at the golf course and would meet the 7 dB noise reduction goal at a minimum height of 8 feet. Barrier SW10 would also break the line-of-sight between truck stacks and receptors at a height of 12 feet.

The estimated construction cost of an 8 to 16 foot noise barrier in this location ranges from $1,399,668 to $2,237,568, which is approximately three to five times the reasonable cost allowance of $440,000. Furthermore, the owner of the golf course may desire visibility for their business from the freeway, and may not support a noise barrier at this location. Therefore, Barrier SW10 is not anticipated to be incorporated into the Build Alternative.

Barrier SW11

Barrier SW11 would be located between Athenour Way and northbound I-680, north of Andrade Road. The height of the modeled noise barrier is 8 to 14 feet and approximately 950 feet in length.

Barrier SW11 would feasibly abate traffic noise for two residences and meet the 7 dB noise reduction goal at a minimum height of 14 feet. Barrier SW11 would also break the line-of-sight between truck stacks and receptors at a height of 14 feet.

The estimated construction cost of a noise barrier in this location is $1,465,787, which is approximately 13 times more than the reasonable cost allowance of $110,000. Therefore, Barrier SW11 is not anticipated to be incorporated into the Build Alternative.

Table 2.2.7-21 Noise Abatement Summary – Segment 10 (Phase 1)

Noise Barrier	Barrier Height (feet)	Acoustically Feasible	Number of Benefitted Receptors	Total Reasonable Allowance	Estimated Construction Cost	Preliminarily Recommended
SW10	8	Yes	8	$440,000	$1,399,668	No
	10	Yes	8	$440,000	$1,534,068	No
	12	Yes	8	$440,000	$1,750,368	No
	14	Yes	8	$440,000	$1,966,668	No
	16	Yes	8	$440,000	$2,237,568	No
SW11	14	Yes	2	$110,000	$1,465,787	No

Source: Caltrans, 2014g

Construction Noise

Measure NOI-1: To reduce the potential for noise impacts resulting from construction activities, the following measures would be implemented during construction:

- Require all construction equipment to conform to Section 14-8.02, Noise Control, of the latest Standard Specifications. Section 14-8.02 states that construction noise shall not exceed an Lmax of 86 dBA at 50 feet from job site activities between the hours of 9 p.m. to 6 a.m.

- Noise-generating construction activities would be restricted to the allowable hours of construction as identified by local jurisdictions, where feasible:

  - Construction is generally allowed to start at 7:00 a.m., Monday through Friday, in communities along the I-680 corridor. Construction activities should end by 7:00 p.m., Monday through Friday.

- Construction activities in Milpitas are allowed between the hours of 7:00 a.m. and 7:00 p.m. on weekends.
- Fremont allows construction between 9:00 a.m. and 6:00 p.m. on Saturdays and prohibits construction on Sundays.
- Alameda County allows construction between 8:00 a.m. and 5:00 p.m. on Saturday and Sunday.

If work is necessary outside of allowable hours, Caltrans would require the contractor(s) implement a construction noise monitoring program and, if feasible, provide additional avoidance measures as necessary (in the form of noise control blankets or other temporary noise barriers, etc.) for affected receptors.

- Pile driving activities would be limited to daytime hours only, where feasible. The contractor(s) would be required to equip all internal combustion engine equipment with intake and exhaust mufflers that are in good condition and appropriate for the machines.

- Unnecessary idling of internal combustion engines within 100 feet of residences would be strictly prohibited.

- The contractor(s) would be required to locate stationary noise generating equipment as far as possible from sensitive receptors.

- The contractor(s) would be required to utilize "quiet" air compressors and other "quiet" equipment, where such technology exists.

- The contractor(s) would prepare a detailed construction plan identifying the schedule for major noise-generating construction activities and distribute this plan to adjacent noise-sensitive receptors. The construction plan would also list the construction noise reduction measures listed above, as applicable.

Phase 1 – Initial Construction Phase

Segments 6 through 10 of the noise study area are located within Phase 1. Refer to the discussions above for a summary of the noise abatement options applicable to the Phase 1 segment (Barriers SW6, SW7, SW9, SW10, SW11, and NB Wall 13).

As previously discussed under **Mitigation Measure NOI-A**, Caltrans intends to incorporate noise abatement in the form of a replacement noise barrier (NB Wall 13), located along northbound I-680, between Palm Avenue and Mission Boulevard. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision of the noise abatement will be made upon completion of the project design and the public involvement processes.

The construction noise reduction measures listed under **Measure NOI-1** would also apply to Phase 1.

2.2.8 ENERGY

REGULATORY SETTING

In accordance with Caltrans' Standard Environmental Reference Guidelines, Chapter 13, Energy (Caltrans, 2005) and FHWA Technical Advisory 6640.8A, a qualitative energy analysis was conducted which discusses the direct and indirect energy conservation potential of the Build and No-Build Alternatives under consideration. The project would not be considered a "Major Project" requiring a more detailed energy analysis, as the project is not likely to have substantial impacts on energy consumption.

The energy impacts of transportation projects are typically divided into two components: (1) the direct energy required for ongoing operations, in this case, the use of petroleum-based fuels and alternative fuels for motor vehicle travel within the project limits, and (2) the indirect energy required to produce the materials for and to carry out construction of the project.

AFFECTED ENVIRONMENT

Recurrent congestion in the I-680 northbound corridor within the project limits is attributable to heavy commuter traffic during evening commute hours, as that is the time period during which the northbound corridor experiences the heaviest traffic demand. The total delay when compared to free flow conditions for a single vehicle passing through the traffic study area during the evening peak hour is estimates to be 15 to 20 minutes. Cumulatively, all of the vehicles during the six-hour evening peak commute period experience a total of approximately 6,620 vehicle-hours of delay with an average travel speed of 46 miles per hour. By 2020, without capacity improvements to I-680, traffic conditions in the project limits would result in further deterioration in traffic congestion and slower vehicle speeds.

Congested traffic conditions contribute to inefficient energy consumption as vehicles use extra fuel while in stop-and-go traffic or moving at slow speeds on a congested roadway.

ENVIRONMENTAL CONSEQUENCES

Direct Energy Usage

Information in this section is based on the Traffic Operations Analysis Study Report that was prepared for the project (Caltrans, 2014n).

Under year 2020 conditions, the Build Alternative would substantially improve the operations along the southern portion of the study corridor when compared to the No-Build Alternative. The Build Alternative would alleviate the bottleneck near Washington Boulevard and provide additional capacity for use by HOV users and toll-paying single-occupant vehicles. The Build Alternative would improve average travel speeds and thereby reduce average travel times. Improved travel speeds would translate to an approximately 50 percent increase in travel speed along the corridor when compared to the No-Build Alternative. By 2040 the Build Alternative would increase the average travel speed by 33 percent when compared to the No-Build Alternative.

The reduction of congestion, delay, and travel time in the project limits under the Build Alternative would result in more efficient energy consumption. In addition, by reducing congestion and delay and improving travel times along north bound I-680, the Build Alternative also would reduce traffic diversion to local streets ("cut-through" traffic) which, under No-Build conditions, would divert to local streets to avoid the extremely congested conditions on I-680.

Under the Build Alternative, it is anticipated that travel times for transit and HOV users will also be reduced. The improved speeds and reduced travel times would work as incentives for commuters and other travelers to carpool. A shift by more commuters into the HOV/express lane would lead to further energy savings when compared to the No-Build Alternative.

The energy needed to power the operational aspects of the Build Alternative would be minimal, and would be adequately supplied by existing Pacific Gas & Electric (PG&E) electric power mix. Furthermore, the Build Alternative would help reduce wasteful energy consumption by improving operations and alleviating traffic congestion. Improved traffic operations under the Build Alternative would reduce direct (operating) energy use and consumption, whether in the form of petroleum fuels or alternative sources of energy, compared to higher fuel consumption under the No-Build Alternative. Maintenance of the roadway would occur under both the Build and No-Build Alternative.

Indirect Energy Usage

The Build Alternative involves no planned use of natural resources beyond fuel and energy needed during construction activities, including the materials needed for construction which require energy to produce and to transport them to them to the project site. However the energy expenditure to construct the Build Alternative would be off-set by the reduction in fuel consumption realized through more efficient freeway operations.

Phase 1 – Initial Construction Phase

The energy effects detailed above for the Build Alternative are applicable to the Phase 1 segment. Implementation of Phase 1, with or without the future phases of the Build Alternative, would result in substantially more efficient operations of the I-680 corridor (see **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**). Phase 1 would have the same beneficial effect on direct energy use as a result of the improved traffic operations. The energy expenditure to construct Phase 1 of the Build Alternative would be off-set by the reduction in fuel consumption realized through more efficient freeway operations.

No-Build Alternative

The No-Build Alternative assumes that the existing I-680 would remain in place and no further action of improvements would occur. As presented in the traffic analysis (see **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**), the forecasted increases in traffic volumes without capacity improvements would result in further deterioration in traffic congestion and slower vehicle speeds along northbound I-680. The beneficial effects on direct energy use as a result of the improved traffic operations under the Build Alternative would not be realized under the No-Build Alternative.

AVOIDANCE, MINIMIZATION AND/OR MITIGATION MEASURES

As a result of the Build Alternative, savings in operational energy requirements would more than offset construction energy requirements and thus, in the long term, result in a net savings in energy usage. The project is anticipated to have a beneficial effect on direct energy use compared to the No-Build Alternative; therefore, no energy avoidance, minimization, or mitigation measures would be necessary.

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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 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 are discussed below in Threatened and Endangered Species **Section 2.3.5**. Wetlands and other waters are discussed below in **Section 2.3.2, Wetlands and Other Waters**.

REGULATORY SETTING

State Senate Concurrent Resolution 17

State Senate Concurrent Resolution 17 concerns protected trees in California, but was not signed into law. Caltrans still utilizes Senate Concurrent Resolution 17 as a guide to assess and determine the effects of their actions on any oak woodland (defined as five or more native oak trees per acre) and to preserve and protect native oak woodlands to the maximum extent feasible or provide replacement plantings where designated oak species are removed from oak woodlands.

California Environmental Quality Act (CEQA)

Caltrans anticipates meeting CEQA obligations through the conservation of habitat for listed species, which includes mitigation for impacts to oak woodlands, as described in **Chapter 3.0**, **CEQA Evaluation**.

Alameda County Tree Ordinance

The Alameda County Tree Ordinance, Ordinance No. 0-2003-23, requires that trees removed on county property must be identified and permitted prior to removal. Trees within Caltrans right-of-way are under state control, and are not subject to this ordinance. Caltrans will coordinate with local agencies in a good faith effort to address tree ordinances.

AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the project (Caltrans, 2014g).

The biological study area (BSA) for the project includes the physical footprint of the Build Alternative, including all areas where ground disturbance would occur from the construction of the proposed improvements (e.g., construction staging areas, demolition, earthmoving activities, etc.), areas of right-of-way to be obtained for the project, and temporary access areas. The BSA was defined to also include the areas of indirect effects that may occur outside of the direct physical footprint of the Build Alternative. **Appendix I** illustrates the limits of the BSA for the Build Alternative.

In general, the BSA includes the entire area within the northbound side of Caltrans' right-of-way along I-680 from south of Yosemite Avenue in Milpitas northward to Koopman Road in unincorporated Alameda County. The BSA also includes a portion of southbound I-680 at the following locations:

- Sheridan Road, where bridge replacement work would occur at post mile 8.3, Alameda County
- Auto Mall Parkway, where hydromodifications would be made at post mile 3.9, Alameda County
- two locations between Mission Boulevard and Scott Creek Road for additional hydromodifications areas at post miles 1.2 and 0.5, Alameda County
- a portion of the paved center median and a short section of the southbound shoulder south of Yosemite Avenue at post mile 6.5, Santa Clara County

The BSA totals approximately 533 acres, of which approximately 232 acres are the paved surfaces of the freeway, on- and off-ramps, and connecting roadways.

Formal studies of biological resources within the BSA were conducted on the following listed survey dates:

- Six site visits conducted between February and March, 2012, served as reconnaissance to map vegetation and identify suitable habitat for special-status plant species in the BSA. The results were used to inform the specific timing and locations for subsequent rare plant surveys.
- Protocol-level special-status plant surveys were conducted within the BSA in the spring and summer of 2012. Early and mid-season floristic surveys were conducted from March 31 to June 13, 2012. A late-season floristic survey was conducted on August 8 and 9, 2012.
- Field investigations were conducted on January 30 and 31, February 2, 3, 7, 8, and 9, and March 7, 8, and 13, 2012 to delineate potential Waters of the U.S., including wetlands and water features.
- A tree survey was conducted over the course of 24 site visits between February 6 and April 3, 2012.

- A habitat assessment for California Red-legged Frog was conducted on December 20, 2011; January 17, 2012, February 21, 15, 16 2012, and March 6 and 8 2012.
- Protocol-level California red-legged frog surveys were conducted on May 16, 17, 23, 24, 30, and 31, Jun 6, 7, 14, 25, and 26, July 24 and 25, and August 8 and 9, 2012.
- A habitat assessment for anadromous fish was conducted on April 3, 2012.
- A habitat assessment for bat species within the BSA was conducted on March 21, 2012.
- Subsequent to the completion of biological technical studies conducted in 2012, the project limits were extended to add an additional 0.75-mile to the south from SR 237 to a point 0.3-mile north of Montague Expressway in Milpitas. The extension area was added to the Build Alternative to accommodate additional signage and associated electrical trenching. On February 27, 2013 the area was assessed for biological resources such as trees and wetlands, and its potential to serve as habitat for special-status plant and wildlife species. One supplemental report was produced that served to update all of the other biological technical studies completed prior to the extension of the project limits.
- Subsequent to the completion of biological technical studies conducted in 2012, the project limits were also extended to the southbound side of I-680 in three specific areas in Fremont. These areas were added to accommodate additional hydromodification areas to control storm water flow from I-680. These areas were assessed on March 13 and 14, 2014 for biological resources such as trees and wetlands, and their potential to serve as habitat for special-status plant and wildlife species.

Habitat Types

Table 2.3.1-1 lists the habitat types present within the BSA, and identifies the temporary and permanent impacts of the Build Alternative to each habitat type. **Appendix I** illustrates the distribution of the habitat types within the BSA. Principal characteristics and general locations of these habitats are described below. The habitat types identified within the BSA support a variety of wildlife species, including mammals, birds, amphibians, reptiles, and fish. Marsh habitats can provide habitat for fish nurseries, amphibians, aquatic reptiles, wading birds, waterfowl, and song birds. Riparian woodland can provide foraging, roosting, and nesting habitat for a variety of birds, and provide cover and refuge sites for small mammals, amphibians, and reptiles. Detailed descriptions of each habitat and vegetation mapping are described in greater detail in the NES.

Table 2.3.1-1 Impacts to Habitat Types within the BSA

Habitat Type	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)
Phase 1				
Grassland	70.64	8.14	10.45	18.95
Oak Woodland	5.81	0.65	0.57	1.22
Coastal Scrub	0.11	0.00	0.00	0.00
Riparian Woodland	0.71	0.06	0.05	0.11
Freshwater Marsh	0.02	0.00	0.00	0.00
Eucalyptus Woodland	0.58	0.00	0.00	0.00
Creek Channel	0.36	0.10	0.01	0.11
Retention Basin	0.51	0.00	0.00	0.00
Urbanized/Landscaped	111.00	16.57	23.71	40.28
Paved Road	129.25	--	--	--
Phase 1 Total	318.99	25.52	34.79	60.31
Future Phases				
Grassland	51.63	4.52	1.65	6.17
Freshwater Marsh	0.15	0.05	0.01	0.06
Creek Channel	0.20	0.00	0.00	0.00
Urbanized/Landscaped	60.34	14.02	9.71	23.73
Paved Road	101.75	--	--	--
Future Phases Total	**214.07**	18.59	11.37	29.96
Build Alternative Total				
Grassland	122.27	12.66	12.10	24.76
Oak Woodland	5.81	0.65	0.57	1.22
Coastal Scrub	0.11	0.00	0.00	0.00
Riparian Woodland	0.71	0.06	0.05	0.11
Freshwater Marsh	0.17	0.05	0.01	0.06
Eucalyptus Woodland	0.58	0.00	0.00	0.00
Creek Channel	0.56	0.10	0.01	0.01
Retention Basin	0.51	0.00	0.00	0.00
Urbanized/Landscaped	171.34	30.59	33.42	64.01
Paved Road	231.00	--	--	--
Build Alternative Total	533.06	44.11	46.16	90.27

Note: Impacts to paved roads are not calculated, because these areas are not considered to contain biological resources.
Source: Caltrans, 2014c

Sensitive Natural Communities

Of the various habitats present within the BSA, oak woodlands, riparian woodlands, and freshwater marsh are considered sensitive communities. Impacts to riparian woodlands and freshwater marsh habitats are discussed in **Section 2.3.2, Wetlands and Other Waters**, which details jurisdictional wetlands and other waters within the BSA. However, a description of each habitat type as it exists within the BSA is provided below.

Grasslands

Mediterranean California Naturalized Annual and Perennial Grassland

Mediterranean California naturalized annual and perennial grassland is the dominant vegetation type within the BSA. This habitat type is characterized by non-native dominated grasslands, including the presence of introduced forbs, found in California. Native grasses and forbs may be present, but have less than a 10 percent relative cover in the herbaceous layer.

Creeping Rye Grass Turfs

Creeping rye (*Leymus triticoides*; currently named *Elymus triticoides*) is a cool-season, sod-forming, long-lived native perennial grass. It is adapted to a wide variety of sub-irrigated soils and is alkaline and saline tolerant. Two areas within the BSA have several natural patches of creeping rye adjacent to large areas of grassland used for grazing cattle. Five turfs occur among hilly grassland west of the Sheridan Avenue, and two turfs occur along westbound SR 84.

Wildlife in Grassland Habitats

Many wildlife species use grasslands for foraging, but some require special habitat features such as cliffs, caves, ponds, or habitats with woody plants for breeding, resting, and escape cover. Characteristic reptiles that breed in annual grassland habitats include the western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalus oregonus*). Mammals typically found in this habitat include the black-tailed jackrabbit (*Lepus californicus*), California ground squirrel (*Otospermophilus beechyi*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), badger (*Taxidea taxus*), and coyote (*Canis latrans*). Birds commonly known to breed in annual grasslands include the burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), horned lark (*Eremophila alpestris*), and western meadowlark (*Sturnella neglecta*). This habitat type also provides foraging habitat for the turkey vulture (*Cathartes aura*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*), white-tailed kite (*Elanus leucurus*), and prairie falcon (*Falco mexicanus*). Listed species that may occur in grasslands within the BSA include California tiger salamander (*Ambystoma californiense*), California red-legged frog (*Rana draytonii*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), and San Joaquin kit fox (*Vulpes macrotis mutica*).

Oak Woodlands

Coast Live Oak Woodland

Coast live oak (*Quercus agrifolia*) is a drought-resistant evergreen tree that can grow to approximately 80 feet tall. Stands vary from upland savannas and woodlands to bottomland, riparian forests with closed tree canopies. The understory structure can be limited to herbaceous cover or can include a complexity of herb and shrub layers.

There are several stands of coast live oak throughout the BSA. Coast live oak woodland is associated in grasslands with California bay (*Umbellularia californica*), California buckeye (*Aesculus californica*), coyote brush, and poison oak, and is associated with valley oak along drainages at SR 84. Coast live oaks are also planted as landscaping within the Caltrans right-of-way.

Valley Oak Woodland

Valley oak is a large, deciduous tree that can grow to approximately 100 feet tall and may live up to 500 years. Stands vary from open savannas to closed-canopy forests. Riparian and upland forests occur in deep, rich soil typical of floodplains and valley floors.

Within the BSA, there are two stands of valley oak along drainages, which run adjacent to both sides of SR 84, to the east of I-680. Within the westbound stand, the understory is primarily coast live oak saplings and non-native grasses. Within the eastbound stand, there is a stand of Arroyo willow (*Salix lasiolepis*), and the surrounding uplands are coast live oak.

Wildlife in Oak Woodlands

The dense understory and thick layer of leaf litter common to this woodland type provide habitat for many species of amphibian, reptile, and small mammal. At least 60 species of mammals may use oaks in some way, and as many as 110 species of birds have been observed during the breeding season in California habitats where oaks form a significant part of the canopy or subcanopy. Listed species that may occur in oak woodlands within the BSA include California tiger salamander, California red-legged frog, and Alameda whipsnake.

Coastal Scrub

Coyote Brush Scrub

Coyote brush (*Baccharis pilularis*) can grow to approximately 10 feet tall and has evergreen leaves. Coyote brush may occupy a number of habitats including river mouths, stream sides, coastal bluffs, coast lines, open slopes, and ridges. Stands can be both transitory to forest and woodland types and persist for a long time.

One stand of coyote brush scrub occurs within the BSA near Sheridan Road. The stand is surrounded by grasslands and is associated with poison oak (*Toxicodendron diversilobum*).

Wildlife in Coastal Scrub Habitat

Numerous birds, mammals, and reptiles utilize coastal scrub habitats. Wildlife found in coastal scrub habitat includes species such as white-crowned sparrow (*Zonotrichia leucophrys*), western fence lizard, whipsnakes (*Masticophis spp.*), gopher snake (*Pituophis catenifer*), and deer mouse (*Peromyscus maniculatus*). Listed species that may occur in coastal scrub within the BSA include California tiger salamander, California red-legged frog, and Alameda whipsnake.

Riparian Woodlands

California Sycamore Woodlands

California sycamore (*Platanus racemosa*) is a fast growing, deciduous tree that may grow to approximately 80 feet tall. Stands occur exclusively in drainages and on north-facing slopes, and are well adapted to intermittent flooding. California sycamore stands may have a grassy herbaceous layer, a well-developed shrub layer, or have a mixed tree canopy.

Within the BSA, one sycamore stand occurs along a small intermittent channel, opposite a Eucalyptus grove, approximately 700 feet south of Alameda Creek. The stand is a mixed-tree canopy with northern California black walnut (*Juglans hindsii*), almond (*Prunus dulcis*), arroyo willow (*Salix lasiolepis*), and Eucalyptus (*Eucalyptus* spp.).

Sandbar Willow Thickets

Sandbar willow (*Salix exigua*) (also known as narrow leaved willow) is a deciduous shrub or small tree usually 6 to 13 feet tall. This habitat is widespread and common in California, especially along seasonally or temporarily flowing streams and at seeps. There are two stands of sandbar willow within the BSA: a small stand adjacent to an intermittent channel near Athenour Way; and a dense clonal stand along Alameda Creek.

Arroyo Willow Thickets

Arroyo willow is a riparian tall shrub or tree that can grow to approximately 25 feet tall. Arroyo willow grows on seasonally or intermittently flooded sites, such as stream banks, slope seeps, and drainages.

Within the BSA, there are two small stands of Arroyo willow near Sunol. One stand is just north of the Mission Grade Inspection Facility, along an ephemeral channel. The second stand is within the valley oak habitat along Vallecitos Creek, which runs adjacent to eastbound SR 84, east of I-680.

Wildlife in Riparian Woodlands

Riparian habitats provide food, water, migration and dispersal corridors; and escape, nesting, and thermal cover for an abundance of wildlife. At least 50 amphibians and reptiles occur in lowland riparian systems. Many are permanent residents, while others are transient or temporal visitors. Over a 100 bird species can use the riparian woodlands as nesting habitat. Additionally, 55 species of mammals are known to use California's Central Valley riparian communities. Listed species that may occur in coastal scrub within the BSA include California tiger salamander, California red-legged frog, and Alameda whipsnake.

Freshwater Marsh

Cattail Marshes

Narrowleaf cattail (*Typha angustifolia*), southern cattail (*T. domingensis*), and broadleaf cattail (*T. latifolia*) are emergent perennial plants that occur in semi-permanently flooded or brackish marshes. Cattail occurs throughout the BSA in seasonal wetlands in low-lying areas such as ditches, swales and basins, in which the soil is inundated or saturated for part of the growing season.

Iris-Leaf Rush Seeps

Pointed rush (*Juncus oxymeris*) and iris-leaved rush (*Juncus xiphioides*) are perennial, plants that have flat leaf blades similar to those of irises. They form small stands in seeps (small pools of water) in various areas throughout California.

Within the BSA, a small stand of iris-leaved rush is present in a freshwater marsh just north of the Mission Grade Inspection Facility, on the Sunol Grade. This area is adjacent to an ephemeral channel with sandbar willow.

Wildlife in Freshwater Marsh Habitat

Common wildlife that could be expected to occur in freshwater marsh habitat include wading birds such as great blue heron (*Ardea herodias*) and green heron (*Butorides virescens*), as well as passerines such as sparrows and towhees. Freshwater marsh can provide breeding habitat for many amphibian species, including Pacific chorus frog (*Pseudacris regilla*) and western toad (*Bufo boreas*). Reptiles such as aquatic garter snakes (*Thamnophis atratus*) and western pond turtle (*Actinemys marmorata*) spend the majority of their life cycles in and around freshwater marsh habitats. Listed species that may occur in freshwater marsh within the BSA include California red-legged frog.

Eucalyptus Woodland

Eucalyptus Groves

Eucalyptus trees are native to Australia and have evolved in fire-prone environments. Widespread commercial plantings occurred after 1870, and in California, they are planted as individual trees, groves, and windbreaks. They have become naturalized on uplands and stream courses. Within the BSA, a eucalyptus grove occurs along a small intermittent channel, approximately 700 feet south of Alameda Creek.

Wildlife in Eucalyptus Woodland

Characteristic species of eucalyptus woodlands include American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), barn owl (*Tyto alba*), red - tailed hawk (Buteo jamaicensis), and red-shouldered hawk (*Buteo lineatus*). Eucalyptus trees are important as roosts, perches, and nest sites for a number of bird species, particularly raptors. Those eucalyptus with stringy bark or a tendency for rapid deposition of litter create microhabitats for a number of small vertebrate species, including alligator lizard (*Elgaria* spp.), gopher snake, and woodrat (*Neotoma* spp.). Listed species are not expected to occur in eucalyptus woodlands within the BSA.

Urban/Landscaped

The Caltrans right-of-way is predominately urban/landscaped. Urban/landscaped areas within the BSA include areas with residential housing, commercial, industrial, and recreational land uses (e.g., sites with structures, paved surfaces, 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 in their right-of-way.

The urban/landscaped areas also include ruderal habitats. Ruderal is the term used to describe roadside vegetation composed of primarily upland weedy, non-native grasses and forbs. It is distinguished from landscaped areas because it is highly disturbed and dominated by invasive weedy species. Grasses and ruderal vegetation within the BSA are tall and thick throughout much of Caltrans' right-of-way.

Wildlife in Urban/Landscaped Areas

Urban habitats are capable of supporting a number of bird species associated with urban environments, and which are known to be tolerant of disturbance by human activities such as wrentits (*Chamaea fasciata*), bushtits (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*), chestnut-backed chickadee (*Poecile rufescens*), and California quail (*Callipepla californica*). Common mammals in these areas include black-tailed deer (*Odocoileus hemonius*), and black-tailed jackrabbit (*Lepus californicus*). Gopher snake and western fence lizard also occur in urban/landscaped areas. Listed species are not expected to occur in these urban land-cover types.

Ruderal habitats are capable of supporting a number of bird species associated with urban environments, and which are known to be tolerant of disturbance by human activities. Common wildlife that could be expected to occur in ruderal habitat includes raccoon, Virginia opossum, striped skunk, and American crow.

Wildlife Corridors

The traffic lanes of the I-680 corridor currently present a passage barrier to animals within the BSA. However, existing crossings under the highway, particularly along the waterways and the culverts, are used by animals to move from one side of the highway to the other. The current condition of existing wildlife corridors (including fish passage for federally listed species) within the BSA is discussed in greater detail under **Sections 2.3.4, Animal Species,** and **2.3.5, Threatened and Endangered Species**, as it pertains to specific sensitive and/or special-status animal species.

The Build Alternative BSA is not currently included within an existing habitat conservation plan (HCP). However, the San Francisco Public Utilities Commission (SFPUC) is currently preparing a HCP for continued operations and maintenance of the Alameda Creek watershed. The HCP will contain substantial mitigation and protective measures for sensitive species in the Alameda Creek watershed, which is anticipated to restore fish passage in the area. The impact analyses within this environmental document, relevant to specific animal species within the BSA, considers the current condition of the creek, but also assumes that additional species are expected to be present at the time of project construction because of the HCP implementation. Refer to **Sections 2.3.4, Animal Species,** and **2.3.5, Threatened and Endangered Species**, for a detailed discussion of the anticipated presence/absence of certain animal species during project construction.

Trees

An estimated 1,074 trees (including native and non-native trees) may be impacted by construction of the proposed Build Alternative. **Table 2.3.4-1** lists the number of native and non-native tree species within the BSA. Trees within the permanent impact areas are likely to be removed due to paving and grading associated with the Build Alternative. Trees in temporary impact areas may be preserved depending on the type of activity that would occur in the area.

Table 2.3.1-2 Impacts to Trees Within BSA

Tree Type	Number of Trees Within Temporary Impact Area	Number of Trees Within Permanent Impact Area	Total Number of Trees Impacted within BSA
Phase 1			
Native Trees	277	438	715
Non Native Trees	94	111	205
Phase 1 Native and Non Native Tree Total	**371**	**549**	**920**

Future Phases			
Native Trees	16	23	39
Non Native Trees	86	29	115
Future Phases Native and Non Native Tree Total	**102**	**52**	**154**
Build Alternative			
Native Trees	293	461	754
Non Native Trees	180	140	320
Build Alternative Native and Non Native Tree Total	**473**	**601**	**1,074**

Source: Caltrans, 2014g

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The temporary and permanent effects of the Build Alternative to the different habitat types within the BSA are shown in **Table 2.3.1-1**, which includes calculations for the Phase 1 and future phases of the proposed improvements. Impacts to paved roads are not calculated, because these areas are not considered to contain any biological resources. The Build Alternative would permanently impact 1.22 acres of oak woodlands, all of which would be affected within Phase 1. **Chapter 3.0** of this EIR/EA includes a complete discussion of this impact as it relates to CEQA.

All other habitat types in **Table 2.3.1-1** are considered protected resources under a number of laws and regulations related to special-status species habitat, and are discussed in detail in the subsequent sections of this analysis. Adverse effects related to wetlands and other waters of the U.S., including riparian woodlands and freshwater marsh habitat, are discussed in **Section 2.3.2**, **Wetlands and Other Waters**. Adverse effects related to special-status plant and animal species associated with the remaining habitat types of the BSA are discussed in **Sections 2.3.3, Plant Species**; **2.3.4, Animal Species**; and **2.3.5, Threatened and Endangered Species**.

Phase 1 – Initial Construction Phase

Construction of Phase 1 of the Build Alternative would result in approximately 1.22 acres of direct impacts oak woodlands within the BSA.

The effects of Phase 1 of the Build Alternative to the remaining habitat types within the BSA are listed in **Table 2.3.1-1**, and are discussed in greater detail in the subsequent sections of this analysis.

Future Phases

Construction of the future phases of the Build Alternative would not impact oak woodlands.

The effects of the future phases of the Build Alternative to the remaining habitat types within the BSA are listed in **Table 2.3.1-1**, and are discussed in greater detail in the subsequent sections of this analysis.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-680 within the project limits. The freeway travel lanes along the I-680 corridor would remain as they currently exist and no HOV/express lane in the northbound direction would be constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to habitat types within the BSA. Implementation of the currently planned and funded projects outside the BSA but within the project region would be required to comply with state and local regulations regarding protected oak woodlands, should those species be identified within areas that would be directly or indirectly affected. Adverse effects to oak woodlands in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Avoidance, minimization, and/or mitigation measures specific to wetlands and other waters of the U.S., including riparian woodlands and freshwater marsh habitat, are discussed in **Section 2.3.2, Wetlands and Other Waters**. Measures specific to adverse effects to special-status plant and animal species associated with the natural communities of the BSA are discussed in **Sections 2.3.3, Plant Species**; **2.3.4, Animal Species**; and **2.3.5, Threatened and Endangered Species**.

Measure BIO-30 will reduce the effects to trees during project construction through revegetation of temporarily impacted areas, which includes the planting of trees where appropriate. Specific tree preservation measures will be addressed during the permitting phase of the project.

Measure BIO-33 will protect and preserve oak woodland to the extent feasible during construction activities.

2.3.2 WETLANDS AND OTHER WATERS

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 Clean Water Act (CWA) (33 United States Code [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. 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 discharge of dredged or fill material cannot 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 U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The USACE issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. 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 Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (U.S. EPA 40 Code of Federal Regulations [CFR] Part 230), and whether permit approval is in the public interest. The 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA 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 (LEDPA) 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 Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as the Federal Highway Administration (FHWA) and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located 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.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCB) and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. 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 Waste Discharge Requirements (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 and to ensure federally authorized projects are in compliance with State law. This is most frequently required in tandem with a Section 404 permit request. Please see **Section 2.2.2, Water Quality and Storm Water Runoff**, for additional details.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans 2014g). Field investigations were conducted from January 30 and 31, February 2, 3, 7, 8, and 9, and March 7, 8, and 13, 2012 to preliminarily delineate jurisdictional wetlands and other waters of the U.S., which are regulated by the USACE, and other waters regulated by the RWQCB and CDFW. The delineations were conducted in accordance with USACE guidance. **Table 2.3.2-1** summarizes the potential jurisdictional waters within the BSA by feature type.

The Preliminary Determination of Jurisdictional Waters was sent by Caltrans to the USACE on August 6, 2013. A wetland verification site visit attended by USACE and Caltrans occurred on March 17, 2014. Caltrans received an approved preliminary jurisdictional determination letter from the USACE on June 19, 2014 concurring that a total of approximately 1.60 acre may be jurisdictional, including 0.37 acre of wetlands and 1.22 acre of other water features. The USACE also concurred that the features labeled FM-2, RB-2, and SW-4 may not be jurisdictional, totaling less than 0.01 acre of wetlands and less than 0.01 acre of other waters.

All wetland and water features mapped within the BSA likely qualify as waters of the State. In addition, water flowing within storm water structures, such as lined channels, culverts, and storm water drains may also qualify as waters of the State.

Table 2.3.2-1 Wetlands and Water Features Affected by the Build Alternative

Feature Type	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)
Phase 1				
Wetland Features	0.25	0.02	0.01	0.03
Other Water Features	0.92	0.10	0.01	0.11
Phase 1 Total	**1.17**	**0.12**	**0.02**	**0.14**
Future Phases				
Wetland Features	0.12	0.05	0.00	0.05
Other Water Features	0.30	0.02	0.05	0.07
Future Phases Total	**0.43**	**0.06**	**0.05**	**0.12**
Build Alternative Total				
Wetland Features	0.37	0.06	0.01	0.08
Other Water Features	1.22	0.12	0.60	0.18
Build Alternative Total	**1.60**	**0.18**	**0.07**	**0.26**

Note: Acreage figures have been rounded. Precise figures are included in the Wetland Delineation technical study.
Source: Caltrans, 2014g

Within the BSA, there are 1.60 acres of wetland and other water features, including 0.37 acre of wetlands and 1.22 acre of other waters. A total of 18 wetland features and 28 other water features were mapped. Four wetland types occur within the BSA: freshwater marsh, riparian scrub, seasonal wetland, and seep. Other water types identified within the BSA include ephemeral channels, intermittent channels, retention basins, and one perennial stream.

Environmental Consequences

The Build Alternative is the only action alternative moving forward for the proposed project. Other alternatives were considered but eliminated as none were deemed viable because of physical constraints and feasibility, or because they did not meet the project's purpose and need. See **Section 1.3.3, Alternatives Considered but Eliminated from Further Discussion**.

Build Alternative

Direct Impacts

The Build Alternative's effects to the wetland and water features within the BSA are shown in **Table 2.3.2-2** above, which includes isolated calculations for Phase 1 and future phases of the proposed improvements. Impacts would occur as a result of grading and paving activities, retaining wall construction, and biofiltration construction.[1] Full build out of the Build Alternative would result in approximately 0.26 acre of direct impacts to wetland and other water features within the BSA.[2]

Principal characteristics and general locations of these features are described in **Section 2.3.1, Natural Communities**. Marsh habitats associated with the wetlands and other water features can provide habitat for fish nurseries, amphibians, aquatic reptiles, wading birds, waterfowl, and song birds. Detailed descriptions of this habitat and mapping are included in greater detail in the Preliminary Determination of Jurisdictional Waters appended to the NES (Caltrans, 2014g).

Indirect Impacts

Construction of the Build Alternative would involve substantial grading and earth moving activities, stockpiling of soils, and the loading, unloading, and transport of excavated and fill material. Rainfall could carry loose soils into adjacent waterways, resulting in increased sedimentation and adverse effects to water quality. Concentrated flow due to grading in some areas will increase the potential for erosion and for increased sediment transport into the adjacent areas. Construction equipment debris and fuel could also further degrade the quality of storm water runoff if fueling activity and maintenance products are not handled properly. This contamination could impact nearby waterways, including the jurisdictional water features within the BSA. Temporary measures that will control pollutant discharges during construction activities are described in **Section 2.2.2, Water Quality and Storm Water Runoff**.

The Build Alternative would add approximately 29 acres of new impervious area, the bulk of which would be added in Phase 1 (approximately 22 acres) through road widening and modifications to the existing roadway and ramps. Additional impervious area prevents runoff from naturally dispersing and infiltrating into the ground, resulting in increased

[1] Biofiltration is a pollution control technique using living material (vegetation) to capture sediment and pollutants from storm water runoff. The proposed permanent storm water treatment facilities for the Build Alternative would include biofiltration strips, biofiltration swales, and detention basins. See **Section 1.3, Project Description**, for a complete description of these improvements.

[2] The impacts to less than 0.01 acre of wetland feature SW-4, located near Auto Mall Parkway, and less than 0.01 acre of water feature RB-2, located near Athenour Way, are not likely to be jurisdictional; see Appendix F of the NES prepared for this project. As a conservative approach to this analysis, wetland feature SW-4 and RB-2 are included in the impacts assessment.

concentrated flow. The additional flow has the potential to transport an increased amount of sediment and pollutants to waterways and water resources, plus create increased erosion resulting from changes to waterway hydrographs (flow versus time) pre- and post-construction. This phenomenon is termed hydromodification.

Phase 1 – Initial Construction Phase

Construction of Phase 1 of the Build Alternative would result in approximately 0.14 acre of direct impacts to wetland and other water features within the BSA.

The indirect effects of the Build Alternative associated with water quality and the natural functions of the wetlands and waters within the BSA, as described above, apply to Phase 1.

Future Phases

Construction of the future phases of the Build Alternative would result in approximately 0.12 acre of direct impacts to wetland and other water features within the BSA.

The indirect effects of the Build Alternative associated with water quality and the natural functions of the wetlands and waters within the BSA, as described above, apply to the future phases.

Permitting

A Section 404 permit is necessary when a project will result in fill to waters under USACE jurisdiction. A preliminary jurisdictional delineation of these resources has been completed and was submitted to USACE for verification. The Build Alternative would result in permanent and temporary effects to wetland and water features within the Caltrans right-of-way. A Section 404 permit would be required for the Build Alternative, including Phase 1.

A Section 401 Water Quality Certification is necessary when a project requires a Section 404 permit from the USACE, and under other special circumstances. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required. The Section 401 Water Quality Certification would be required for completion of Phase 1 of the Build Alternative.

A Lake or Streambed Alteration Agreement with CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. The Build Alternative would result in alterations to the bed and banks of Alameda Creek as result of creek diversion and pollution/siltation prevention systems to be installed during construction. Therefore, a permit would be required. This permit would be required for the completion of Phase 1 of the Build Alternative. No work resulting in the alteration of a stream or lake is anticipated within the future phases of the Build Alternative; a permit is not anticipated for construction of the future phases. Approximately 0.14 acre of impacts, all located in Phase1, including 0.12 acre of temporary and 0.02 acre of permanent impacts, are likely to be subject to a Lake and Streambed Alteration Agreement (1602). This includes impacts to features identified as intermittent channels, perennial streams, and riparian scrub in the preliminary jurisdictional determination. No impacts likely to be subject to a Lake and Streambed Alteration Agreement will occur within the future phases.

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to I-680 or the connecting roadways within the BSA. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of jurisdictional waters as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USACE, RWQCB, and CDFW requirements regarding protected Waters of the U.S., should those features be identified within areas that would be directly or indirectly affected. The potential presence of jurisdictional waters in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction activities and operation of the roadway improvements would be regulated under the applicable Caltrans' National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Management Plan (SWMP), which regulate storm water discharge from activities on roadways. The potential for adverse effects to water quality will be avoided by implementing temporary and permanent Best Management Practices (BMPs) outlined in the Storm Water Pollution Prevention Plan (SWPPP). Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The project would not violate any water quality standards, deplete groundwater supplies, alter drainage patterns, or create capacity exceeding runoff. See **Section 2.2.1, Hydrology and Floodplain**, and **Section 2.2.2, Water Quality and Storm Water Runoff (Measures WQ-1, WQ-2,** and **WQ-3)** for a more detailed analysis of the avoidance measures that would be implemented to protect water quality. These avoidance measures would also protect the natural functions of the affected wetlands and waters and any associated habitat. Implementation of these measures **(Measures WQ-1, WQ-2, WQ-3, and BIO 33)** would provide the avoidance and minimization measures required to minimize the indirect impacts to wetlands and other water features located within the BSA. No measures that would avoid or minimize direct impacts to wetlands and other water features in the BSA are identified, and therefore compensatory mitigation is provided below.

Mitigation Measure BIO-A: Compensatory Mitigation for Jurisdictional Water Features. Any impacts to jurisdictional water features that cannot be recreated on-site shall be subject to formalized mitigation requirements of the regulatory agencies. A conceptual restoration and mitigation plan shall be prepared prior to permit applications to regulatory agencies. The on-site restoration of Waters of the U.S. combined with the implementation of other components of the conceptual restoration and mitigation plan will ensure no net loss of functions and values of Waters of the U.S.

The off-site mitigation ratio proposed for Waters of the U.S., including wetlands, under jurisdiction of the USACE, is 1:1 acres of mitigation per acre of permanent impact. The mitigation ratio proposed for temporary impacts is 1:1 acre of mitigation per acre of temporary impact. All of the mitigation for temporary impacts is anticipated to be achieved on-site by restoring impacted areas to pre-project conditions. Final impact quantities and required mitigation will be determined during the permitting process with USACE.

Off-site mitigation for permanent impacts is proposed through purchase of credits at an approved mitigation bank. A conceptual on-site restoration and mitigation plan would be included in the permit applications to regulatory agencies. This plan would include a native plant palette list, plant establishment period, success criteria, and a monitoring and reporting schedule that would be reviewed and approved by the regulatory agencies prior to project construction. In addition, under Section 401 of the Clean Water Act, the RWQCB may request or require mitigation as part of the Water Quality Certification. Caltrans would obtain this certification during the permitting phase of project development.

Table 2.3.2-2 summarizes the anticipated compensatory mitigation requirements of the Build Alternative, isolating Phase 1 and future phase calculations.

Table 2.3.2-2 Proposed Compensatory Mitigation for Wetlands and Water Features Affected by the Build Alternative

Feature Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)	Total Impacts (Acres)	Total Mitigation (1:1 Ratio) (Acres)
Phase 1				
Wetland Features	0.02	0.01	0.03	0.03
Other Water Features	0.10	0.01	0.11	0.11
Phase 1 Total	**0.12**	**0.02**	**0.14**	**0.14**
Future Phases				
Wetland Features	0.05	0.00	0.05	0.05
Other Water Features	0.02	0.05	0.07	0.07
Future Phases Total	**0.06**	**0.05**	**0.12**	**0.12**
Build Alternative Total				
Wetland Features	0.06	0.01	0.08	0.08
Other Water Features	0.12	0.06	0.18	0.18
Build Alternative Total	**0.18**	**0.07**	**0.25**	**0.25**

Note: Acreage figures have been rounded. Precise figures are included in the Wetland Delineation technical study.
Source: Caltrans, 2014g

Mitigation Measure BIO-A, in combination with the avoidance and minimization measures listed above (**Measures WQ-1, WQ-2,** and **WQ-3**), would reduce effects to wetlands and waters of the U.S. to a negligible level, and may be used to satisfy the conditions of multiple agencies and jurisdictions.

2.3.3 PLANT SPECIES

REGULATORY SETTING

The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (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 Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species **Section 2.3.5** in this document for detailed information about these 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 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, CA Public Resources Code, Sections 2100-21177.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans, 2014g).

The identification of special-status plant species with potential to occur in the region was based on a search of the USFWS Species List Database and the CNPS Inventory of Rare and Endangered Plants for the following 7.5-minute quadrangles: Calaveras Reservoir, Milpitas, San Jose West, San Jose East, Mountain View, Cupertino, Livermore, Dublin, Niles, La Costa Valley, Hayward, and Newark. The California Natural Diversity Database (CNDDB) was queried for all occurrence records within 5 miles of the BSA. The database searches and initial habitat mapping identified 11 special-status plant species that could occur within the BSA. Field surveys were also conducted during the flowering period of each species. **Table 2.3.3.-1** lists these 11 special status plant species and their potential to occur within the BSA.

Table 2.3.3-1 Special Status Plant Species With Potential to Occur Within the BSA

Plant Species	Potential to Occur Within the BSA
Big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*)	Low
Round-leaved filaree (*California macrophylla*)	Low
Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)	Low
Fragrant fritillary (*Fritillaria liliacea*)	Low
Diablo helianthella (*Helianthella castanea*)	Low
Santa Cruz tarplant (*Holocarpha macradenia)*	Low
Woolly-headed lessingia (*Lessingia hololeuca)*	Low
Mt. Diablo cottonweed (*Micropus amphibolus)*	Low
Maple-leaved checkerbloom (*Sidalcea malachroides)*	Low
Caper-fruited tropidocarpum (*Tropidocarpum capparideum)*	Low

Source: Caltrans 2014g

Based on the database searches and initial habitat mapping, protocol-level special-status plant surveys were completed within the BSA in 2012. The goals of the protocol-level surveys were to locate, map, and record any special-status plant populations within the BSA. No special-status plants were identified during the protocol-level surveys.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Since there are no known special-status plant species occurrences within the BSA, there would be no adverse effects to such species from the proposed Build Alternative (Phase 1 and future phases).

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to the northbound I-680 corridor, within the project limits. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of special-status plant species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected plant species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of special-status plant species in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Measure BIO-30: Revegetation Following Construction. All areas that are temporarily affected during construction will be revegetated with an assemblage of native grass, shrub, and tree species to restore habitat values. Invasive, exotic plants will be controlled within the BSA to the maximum extent practicable pursuant to Executive Order 13112.

Although no known special status plant species occur within the BSA, to ensure that no new species would be impacted from the time of environmental clearance to construction, the following avoidance measure is proposed:

Measure BIO-31: Seasonally Timed Rare Plant Pre-construction Surveys. In the year prior to the beginning of any ground disturbance for the project, a seasonally-timed rare-plant survey will be conducted by a qualified biologist. The survey requires two site visits to cover the blooming periods for rare plants that have potential to occur within the project limits. One survey must be completed between March and April for early-blooming plants, and the second must be completed between June and August for late-blooming plants. Surveys are only required in areas identified as suitable habitat for rare plants, which includes between Koopman Road and North Mission Boulevard (SR 238), or on the northbound side of I-680 between Scott Creek Road and SR 262.

2.3.4 ANIMAL SPECIES

REGULATORY SETTING

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) and the California Department of Fish and Wildlife (CDFW) are responsible for implementing these laws. This section discusses impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in **Section 2.3.5, Threatened and Endangered Species** below. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Section 4150 and 4152 of the California Fish and Game Code

AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the project (Caltrans, 2014g).

The identification of special-status animal species with potential to occur in the region was based on a search of the USFWS Species List Database and the CNDDB for the 12 USGS quadrangles surrounding the BSA, as well as field reconnaissance surveys, habitat assessments, and a preliminary wetland delineation survey completed for the project. The results of these efforts are further discussed in the appropriate sections below, and are documented in the NES.

A literature and database search, and the biologist's familiarity with the region, identified 61 wildlife species that could potentially occur within the BSA. **Appendix J** lists special status wildlife with potential to occur within the BSA. A wildlife habitat assessment was conducted within the BSA in late 2011, and 32 of these species were dropped from consideration based on a lack of suitable habitat. Those species dropped from consideration are not discussed further. The following five species that have the potential to occur within the BSA are federally and/or state threatened species and are described in **Section 2.3.5, Threatened and Endangered Species:**

- California tiger salamander
- California red-legged frog
- Alameda whipsnake
- San Joaquin kit fox
- Central California coast Distinct Population Segment (DPS) steelhead

The remaining 24 special-status species are discussed below.

Western Burrowing Owl

Western burrowing owl (*Athene cunicularia hypugaea*) is designated as a California Species of Special Concern. The Western burrowing owl prefers open, flat, or sloped grasslands and requires burrows for nesting and wintering habitat, but will also nest in artificial structures such as open pipes, concrete rubble piles, and small, dry culverts. They forage in grasslands, the margins of agricultural fields, and urban areas with short vegetation or bare soil. There are 36 occurrences of burrowing owl recorded in the CNDDB within 5 miles of the BSA and no occurrences in the open hills north of North Mission Boulevard (SR 238). Although individual owls may occasionally forage within the BSA, the potential is low.

Western Pond Turtle

Western pond turtle (*Emys marmorata*) is a California Species of Special Concern. Western pond turtles occur in a variety of aquatic habitats, such as ponds, marshes, rivers, streams, and ephemeral pools; and require deep, slack, or slow-moving water habitat for feeding, suitable unshaded dry habitat for basking and hauling out and upland nesting areas. There is moderate potential for the Alameda Creek to serve as habitat for the western pond turtle. Turtles travelling into uplands for nesting or dispersal may use grassland, oak woodland, riparian woodland, or freshwater marsh habitats. Western pond turtles may occur within the BSA in these habitats north of North Mission Boulevard (SR 238). Suitable aquatic habitat is present within the BSA at Alameda Creek and in the Sabercat Mitigation Pond. There is no suitable habitat for western pond turtle within the future phases of the Build Alternative.

American Badger

American badger (*Taxidea taxus*) is a California Species of Special Concern. The American badger occurs in open habitats, such as grassland, oak savanna, and coastal scrub with multiple burrows for resting and rearing young. There are no occurrences of American badger recorded in the CNDDB within 5 miles of the BSA; however, they may still be present within the region as they are wide-ranging, cryptic, and relatively sparsely distributed. Suitable habitat, although of marginal quality, is present in grassland, oak woodland, and riparian woodland habitats within the BSA.

San Francisco Dusky-Footed Woodrat

The San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) is a California Species of Special Concern. The woodrat inhabits densely forested areas with a brushy understory, such as in riparian areas and oak woodlands; but may also nest in chaparral, coastal sage-scrub and mixed coniferous forests. There is one occurrence of San Francisco dusky-footed woodrat recorded in the CNDDB within 5 miles of the BSA; approximately 1.5 miles northwest of the BSA. Two woodrat nests were observed in the riparian corridor of Vallecitos Creek, immediately adjacent to the Caltrans right-of-way at the I-680/SR 84 Interchange. Woodrats may also occur in other oak woodland and riparian woodland habitats within the BSA.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) (16 USC 703) protects migratory birds, their occupied nests, and their eggs. Removal or disturbance of active nests would be in violation of these regulations. All birds are protected under the MBTA and California Fish and Game Code except for three non-native species, the European starling (*Sturnus vulgaris*), the house sparrow (*Passer domesticus*) and the rock pigeon (*Columba livia*). In addition to common bird species, several special-status bird species have at least some potential to nest or forage within the BSA, including:

- Cooper's hawk *(Accipiter cooperii)*, included on CDFW's Special Animals List
- Sharp-shinned hawk (*Accipiter striatus*), included on CDFW's Special Animals List
- Tri-colored blackbird (*Agelaius tricolor*), a California Species of Special Concern
- Golden eagle *(Aquila chrysaetos),* a Fully Protected Species
- Ferruginous hawk (*Buteo regalis*), included on CDFW's Special Animals List
- Northern harrier (*Circus cyaneus*), a California Species of Special Concern
- Yellow warbler (*Dendroica petechia brewsteri*), a California Species of Special Concern
- White-tailed kite *(Elanus leucurus),* a Fully Protected Species
- California horned lark (*Eremophila alpestris actia*), included on CDFW's Special Animals List
- Prairie falcon *(Falco mexicanus),* included on CDFW's Special Animals List
- American peregrine falcon (*Falco peregrinus anatum*), a Fully Protected Species
- Loggerhead shrike (*Lanius ludovicianus*), a California Species of Special Concern

All habitat types within the BSA except for paved roads and open water may be used by one or more of these migratory bird species for nesting. The riparian area at Alameda Creek is particularly attractive for nesting birds, as well as the majority of the bridge crossings on I-680, within the project limits.

Bat Species

Eight state special-status bat species have potential to occur within the BSA based on range, habitat, and recorded occurrences in the region:

- Pallid bat *(Antrozous pallidus)*, a California Species of Special Concern
- Townsend's big-eared bat *(Corynorhinus townsendii)*, a California Species of Special Concern
- Western mastiff bat *(Eumops perotis californicus),* a California Species of Special Concern
- Western red bat *(Lasiurus blossevillii),* a California Species of Special Concern
- Hoary bat *(Lasiurus cinereus),* state special animals list

- Long-eared myotis *(Myotis evotis),* state special animals list
- Fringed myotis (*Myotis thysanodes*), state special animals list
- Yuma myotis *(Myotis yumanensis),* state special animals list

There are two occurrences of pallid bat recorded within 5 miles of the BSA. There is one occurrence of Townsend's big-eared bat within 5 miles of the BSA. There are no recorded occurrences of the western mastiff bat, hoary bat, or long eared myotis in the CNDDB within 5 miles of the BSA. There are two occurrences of Yuma myotis recorded within 5 miles of the BSA. Further, additional special-status bats may still be present in the BSA because they are nocturnal, difficult to detect, and difficult to positively identify when detected.

Bats are nocturnal and may be found in any habitat. Different bat species will roost in a variety of places, including crevices, caves, mines, buildings, bridges, trees, and snags. Some species are nearly or entirely solitary, while others gather in roosting colonies numbering in the thousands or even millions. The understructures of the 15 bridges within the project limits were found to have suitable day and night roost habitats for bats; however, the potential is low, based on the fact that most of the bridges span roadways rather than waterways or floodplains (waterway or floodplain crossings are preferred by this species). Only the bridge over Alameda Creek passes over a large stream, and therefore has a high potential to attract day roosting bats. Night roosts were confirmed at seven bridges. Trees in riparian woodland habitats along Alameda Creek may also provide day-roosting habitat for bats.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Western Burrowing Owl, Western Pond Turtle, American Badger, and San Francisco Dusky-Footed Woodrat

Earth-moving construction activities and staging of construction materials may result in direct impacts to suitable habitat for the western burrowing owl, western pond turtle, American badger, and San Francisco dusky-footed woodrat.

Burrowing owls may be indirectly affected by noise, light, and visual disturbance; however, since the project limits are already highly disturbed due to existing roadway traffic, these effects are expected to be negligible. Indirect impacts to western pond turtles may result from habitat exclusion (i.e., physically preventing the animal from entering suitable habitat) and water quality degradation from erosion, sediment loading or construction activities. If woodrat nests are located in the zone of temporary impact for the Build Alternative, construction noise and activity could disturb the woodrats enough to cause nest abandonment.

Migratory Birds

Tree removal for the Build Alternative would reduce nesting habitat for a number of bird species protected under the Migratory Bird Species Act. Temporary displacement due to habitat alterations or disturbance from construction equipment noise could also occur as a result of the project.

Bat Species

Direct mortality of bats may occur if day roosts are removed during bridge widening or tree removal. Bats may be directly harmed by construction equipment, or forced into the open where they will become vulnerable to predation and mortality from exposure if they cannot find an alternative roost site.

Night roosts at several bridges may be indirectly impacted by noise, nighttime lighting, vibration from construction activities, and disturbance from humans and equipment moving under the bridge. These night roosts may become temporarily unavailable for use by bats during project construction. However, because night roosts are only used for temporary refuge during nightly foraging, bats are typically able to relocate to other suitable roosts nearby.

Phase 1 - Initial Construction Phase and Future Phases

Adverse effects to animal species described above for the Build Alternative are applicable to Phase 1 and future phases. The effects summarized in the above discussion provide specific sensitive habitat locations for Phase 1 and future phases, for each animal species, respectively. As previously discussed, the distribution of suitable habitat types within the BSA varies depending on the characteristics and needs of the animal species. Certain habitat types are more prevalent in Phase 1 of the Build Alternative because of the aquatic features and riparian vegetation associated with creek crossings, specifically Alameda Creek. As such, Phase 1 of the Build Alternative is expected to have slightly higher direct and indirect effects to animal species when compare to the future phases.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-680 within the project limits. The freeway travel lanes along the I-680 corridor would remain as they currently exist and no HOV/express lane in the northbound direction would be constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to biological resources. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of special-status animal species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected animal species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of special-status animal species in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality**; **Measures WQ-1, WQ-2,** and **WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that could be present in these aquatic habitats.

Western Burrowing Owl

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below would reduce the potential for adverse effects to western burrowing owl during project construction. Species-specific measures from CDFW's Staff Report on Burrowing Owl Mitigation include occupancy surveys (**Measure BIO-11**). If burrowing owls are found to occupy habitat in or adjoining the project area, avoidance and minimization measures will be determined in consultation with CDFW.

Western Pond Turtle

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below would reduce the potential for adverse effects to western pond turtle during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), prevention of wildlife entrapment (**Measure BIO-4**), and wildlife exclusion fencing (**Measure BIO-5**), pre-construction surveys (**Measure BIO-8**), and the prohibition of monofilament plastic (**Measure BIO-27**).

American Badger

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below would reduce the potential for adverse effects to American badger during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), prevention of wildlife entrapment (**Measure BIO-4**), wildlife exclusion fencing (**Measure BIO-5**), and pre-construction surveys (**Measure BIO-8**).

San Francisco Dusky-footed Woodrat

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below, including woodrat surveys (**Measure BIO-12**), would reduce the potential for effects to San Francisco dusky-footed woodrat during construction.

Bat Species

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below would reduce the potential for effects to roosting bats during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), construction equipment location placement to minimize disturbance (**Measure BIO-14**), daytime surveys during the early summer, mid-summer, late summer, and winter (**Measure BIO-15**), tree assessment for roosting habitat prior to tree removal (**Measure BIO-16**), , and roosting exclusion at Alameda Creek Bridge (**Measure BIO 32**).

Migratory Birds

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below would reduce the potential for adverse effects to migratory bird species. These measures include a work window (**Measure BIO-7**), pre-construction surveys (**Measure BIO-9**), non-disturbance buffers for nesting birds (**Measure Bio-10**), and deterrence of colony-nesting birds prior to construction (**Measure BIO-29**).

For the Alameda Creek Bridge widening, an estimated seven trees within the riparian corridor may require removal for construction. These will be included in a 1602 Lake and Streambed Alteration Agreement application to CDFW and may require replacement under that permit.

Phase 1 - Initial Construction Phase and Future Phases

Avoidance, minimization, and mitigation measures described above for the Build Alternative are applicable to Phase 1 and future phases of the project. As previously discussed, the distribution of suitable habitat types within the BSA varies dependent on the characteristics and needs of the animal species. Certain habitat types are more prevalent in Phase 1 of the Build Alternative because of the aquatic features and riparian vegetation associated with creek crossings, specifically Alameda Creek. As such, Phase 1 of the Build Alternative is expected to have slightly higher direct and indirect effects to habitats that support protected animal species when compare to the future phases. Where applicable, the avoidance and minimization measures specify the locations in which the measures should be applied (i.e., measures that dictate restrictions on work within Alameda Creek are thereby only applicable to Phase 1 of the project).

2.3.5 THREATENED AND ENDANGERED SPECIES

This section addresses species listed or eligible for listing as threatened or endangered. The USFWS list of federally-listed species that occur within the BSA is provided in **Appendix M** of this document. These species may occur in the same quadrangles as the project limits or in surrounding quadrangles. This list includes both species within those quadrangles and species that may be affected by projects within those quadrangles.

REGULATORY SETTING

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (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 the Federal Highway Administration (FHWA), are required to consult with the US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) 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, a Letter of Concurrence and/or documentation of a No Effect finding. 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 California Endangered Species Act (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 California Department of Fish and Wildlife (CDFW) is the agency responsible for implementing CESA. Section 2080 of the 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 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 the CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the project (Caltrans, 2014g).

The identification of threatened or endangered animal species with potential to occur in the region was based on a search of the USFWS Species List Database and the CNDDB for the 12 USGS quadrangles surrounding the BSA, as well as field reconnaissance surveys, habitat assessments, and the preliminary wetland delineation survey completed for the project. As previously discussed in **Section 2.3.4, Animal Species,** five species listed as endangered or threatened under CESA or FESA have the potential to occur within the BSA. These species include: California tiger salamander, California red-legged frog, Alameda whipsnake, San Joaquin kit fox, and Central California coast DPS steelhead.

California Tiger Salamander

The California tiger salamander is a federally and State listed threatened species. Within the Bay Area, Alameda and Contra Costa counties support the greatest concentrations of California tiger salamander. Two different habitats are required to complete their life cycle. Dry summer and fall months are spent in upland burrows originally excavated by small mammals that provide food sources and protection from drying. California tiger salamanders emerge from burrows on rainy nights during fall and winter to migrate to breeding ponds, which may be vernal pools, stock ponds, or other ponded water. After breeding, the adults may continue to actively feed on the surface for about two weeks. Larval California tiger salamanders are aquatic and can metamorphose as soon as 10 weeks after hatching, though they typically take longer depending on environmental conditions.

Adult California tiger salamanders typically move to post-breeding refugia that are close to breeding ponds traveling to burrows 62 to 813 feet from ponds. Juveniles disperse further from ponds than their adult counterparts, and have been captured between 300 and about 2,000 feet away from pools in various studies. Longer-distance traveling individuals have been found as far as 1.3 miles from breeding ponds.

There are 73 occurrences of California tiger salamander recorded within 5 miles of the BSA, 21 of which are within the species' known 1.3-mile dispersal range. Suitable upland habitat is present in grassland and oak woodland habitats, as well as existing squirrel burrows within the BSA. There are numerous ponds within 1.3 miles of the BSA that could contain suitable breeding habitat, including a stock pond located just 0.1 mile (approximately 550 feet) from the BSA. California tiger salamanders have the potential to occur in grassland and oak woodland habitats in two sections of the BSA:

- between Koopman Road and North Mission Boulevard (SR 238)
- between South Mission Boulevard (SR 262) and Scott Creek Road

California tiger salamanders are not expected to occur within the BSA outside of these areas due to urban development on both sides of I-680.

Protocol-level surveys for California tiger salamander were not conducted for this project. The California tiger salamander is inferred to be present because there are numerous confirmed and potential breeding ponds within the species' known dispersal distance, and because an adult was discovered immediately adjacent to the current BSA during freeway construction in 2009. There is no designated critical habitat for California tiger salamander within the BSA.

California Red-Legged Frog

The California red-legged frog is a federally threatened species and a California species of special concern. California red-legged frogs have been found breeding in ponds and slow-moving or still sections of streams to escape and help rear their young and require some emergent vegetation or shoreline for attachment of egg masses. Often adults will stay within the breeding habitat year-round if sufficient water is present, but some will move into adjacent uplands or other non-breeding aquatic habitat. Migrating individuals will disperse from breeding sites in straight-line movements, without regard to vegetation or topography and have been found as far as two miles from breeding ponds.

There are 18 occurrences of California red-legged frog recorded within 5 miles of the BSA, two of which are within 1 mile. The majority of these occurrences are located among the undeveloped grassy hills flanking the part of the BSA northeast of North Mission Boulevard (SR 238), along the Sunol Grade, with one occurrence south of North Mission Boulevard (SR 238) in a stream channel immediately adjacent to the BSA and near the South Mission Boulevard (SR 262) exit. The California red-legged frog was detected at two aquatic locations within 1 mile of the BSA per a habitat assessment and survey. Several adults were observed within a stock pond approximately 0.11 mile from the BSA near the Vargas Road exit, and a single juvenile was detected in a stream approximately 0.04 mile from the BSA, along the Sunol Grade between the Sheridan Road and Andrade Road exits.

No critical habitat is designated for the California red-legged frog within the BSA. The nearest designated critical habitat is located approximately one mile southeast of the BSA, in the vicinity of San Antonio Reservoir.

California red-legged frog have potential to occur in grassland, oak woodland, riparian woodland, freshwater marsh, and creek channel habitats within the BSA in two sections of the BSA:

- between Koopman Road and North Mission Boulevard (SR 238)
- between South Mission Boulevard (SR 262) and Scott Creek Road

California red-legged frogs are not expected to occur within the BSA outside of these areas due to urban development on both sides of I-680.

The California red-legged frog is inferred to be present within the BSA because of its close proximity to critical habitat, and because there are numerous confirmed and potential breeding ponds within the species' known dispersal distance.

Alameda Whipsnake

The Alameda whipsnake is a federally and State threatened species. Alameda whipsnakes typically occur on south-, southwest-, and southeast-facing slopes. They require open coastal shrub or chaparral, with small mammal burrows as retreat sites. Rock outcrops provide cover and hunting opportunities for this species. This species will also venture into adjacent habitats, including grassland, oak savanna, and occasionally oak woodland. Individual whipsnakes have been located over 4 miles from coastal scrub or chaparral habitat, though they have been found to occur more regularly within 1,640 feet of scrub habitats. They may also travel along riparian corridors that have open coastal shrub or chaparral habitat. The Alameda whipsnake is not expected to occur in urbanized areas.

There are 31 recorded occurrences of Alameda whipsnake within the 12-quadrangle CNDDB search area around the BSA. Habitat linkages that cross the I-680 corridor within the project limits include the Alameda Creek crossing; the crossing at the I-680/SR 84 interchange; underpasses at Calaveras Boulevard, Koopman Road, and Vargas Road; and culverts carrying streams and drainage channels under the freeway. No other dispersal corridors exist within the BSA south of North Mission Boulevard (SR 238).

No critical habitat for the Alameda whipsnake occurs within the BSA. The nearest critical habitat is located approximately one mile northwest of the BSA. Due to the high mobility of this species, the presence of known populations and critical habitat in the region, and the presence of dispersal corridors within the project limits, Alameda whipsnakes have potential to occur in grassland, oak woodland, and riparian woodland habitats in two sections of the BSA:

- between Koopman Road and North Mission Boulevard (SR 238)
- between Scott Creek Road and South Mission Boulevard (SR 262)

Alameda whipsnakes are not expected to occur within the BSA outside of these areas due to urban development on both sides of I-680.

San Joaquin Kit Fox

The San Joaquin kit fox is a federally endangered and state listed threatened species. The San Joaquin kit fox is endemic to California and has known range in Alameda and Contra Costa counties. It is extremely rare and sparsely distributed due to habitat loss and the constriction of dispersal corridors. Dens are generally located in open areas with grass or grass and scattered brush. San Joaquin kit foxes maintain multiple dens and den use varies for breeding dispersal and temporary shelter.

There are no recorded occurrences of San Joaquin kit fox within 5 miles of the BSA and no critical habitat has been designated nearby. It is unlikely that San Joaquin kit foxes would dig or use dens within the BSA due to constant disturbance from I-680 and other intersecting roads. However, San Joaquin kit foxes may use grassland, oak woodland, and riparian woodland habitats within the BSA north of North Mission Boulevard (SR 238) for dispersal. They are not expected to occur in urbanized areas.

Central California coast Distinct Population Segment (DPS) steelhead

Steelhead are an anadromous salmonid that are listed pursuant to CESA. This fish species occurs in rivers and bay basins with shaded pools of small, cool, low-flow upstream reaches. The only stream within the BSA capable of supporting steelhead is Alameda Creek, which crosses I-680 just south of the town of Sunol. Currently, fish passage between Alameda Creek and San Francisco Bay is blocked within the City of Fremont by a concrete grade control structure (the “BART weir”) located 8.75 miles downstream from the BSA. Because these fish are prevented from leaving the watershed by the BART weir, they are not currently considered to be fully anadromous in this region and do not receive protection under FESA. Additionally, no critical habitat is present within the BSA.

A fish ladder is scheduled to be installed early 2016 at the BART weir that would allow for fish passage between San Francisco Bay and the Alameda Creek watershed. With the fish ladder constructed, steelhead within Alameda Creek will likely be included by the National Marine Fisheries Service (NMFS) as part of the federally-listed threatened central California coast steelhead DPS. As construction of the fish ladder is anticipated to begin in 2016, steelhead potentially occurring within the BSA are likely to be subject to protection under FESA at the time of project construction. Within the BSA, Alameda Creek provides rearing habitat for many fish species, including steelhead, however spawning habitat within the study area is marginal.

ENVIRONMENTAL CONSEQUENCES

As previously discussed in **Section 2.3.4, Animal Species,** five species listed as endangered or threatened under CESA or FESA have the potential to occur within the BSA. These species include: California tiger salamander, California red-legged frog, Alameda whipsnake, San

Joaquin kit fox, and Central California coast DPS steelhead. There will be no effect to any other federally listed species or critical habitat (see **Appendix J** for effects findings for all federally listed species).

Build Alternative

California Tiger Salamanders, California Red-legged Frogs, and Alameda Whipsnake

California tiger salamanders, California red-legged frogs, and Alameda whipsnakes may suffer direct harassment, harm, injury, or mortality as a result of construction activities. Construction activities that could affect these species include initial site preparation, during use of heavy equipment for excavation and backfill, and during handling of stockpiles and stored materials (construction staging). The project **May Affect, and is likely to Adversely Affect** these three species.

Construction activities within the Build Alternative would also have temporary and permanent effects on various habitat types that provide upland, foraging, and dispersal habitats for these protected species. These effects are summarized in **Table 2.3.5-1** by acreage for each habitat type. Impact totals for the complete construction of the Build Alternative, as well totals for Phase 1 and future phases is provided in the table. Proposed compensatory mitigation for impacts to each protected species is provided in the *Avoidance, Minimization, and Mitigation Measures* section presented further below.

The addition of a new northbound I-680 HOV/express lane is not likely to cause an increase in vehicle-related mortality to protected species, because survival of individuals attempting to cross the surface of the freeway is already likely to be at or near zero percent due to the large distance that must be traversed to reach the other side. The increased length of crossings resulting from bridge and culvert widening may dissuade some species from utilizing them, particularly in the case of enclosed culverts if the end of the passage is not visible. In addition, new freeway lighting may illuminate areas that are used by California tiger salamanders and California red-legged frogs during the night, making them easier to see and therefore more vulnerable to predation. These proposed habitat modifications would have an adverse effect on the essential behavioral patterns of the species, including foraging, migration, and aestivation. **No Adverse Effect** to the breeding behavior of the California tiger salamander, California red-legged frog, or Alameda whipsnake is anticipated as a result of the Build Alternative.

San Joaquin Kit Fox

The project **May Affect, but is Not Likely to Adversely Affect**, the San Joaquin kit fox. The lack of reported observations of San Joaquin kit fox in the area and, the general consensus that the BSA is at the periphery of the range of the species supports a conclusion that if the species does occur, it does so sporadically and in low numbers. Since the proposed improvements would occur on the margins of the known current range of San Joaquin kit fox, and because avoidance and minimization measures will be implemented to protect any

Table 2.3.5-1 Summary of Impacts to Threatened and/or Endangered Species Habitat

Species	Suitable Habitat Types	Habitat Impacts (acres)		
		Temporary	Permanent	Total
Phase 1				
California tiger salamander	Grassland Oak woodland	8.79	11.02	19.81
California red-legged frog	Grassland Oak woodland Riparian woodland Creek channel	8.95	11.08	20.03
Alameda whipsnake	Grassland Oak woodland Riparian woodland	8.85	11.07	19.92
Future Phases				
California tiger salamander	Grassland	4.52	1.65	6.17
California red-legged frog	Grassland Freshwater marsh	4.57	1.66	6.23
Alameda whipsnake	Grassland	4.52	1.65	6.17
Build Alternative Total				
California tiger salamander	Grassland Oak woodland	13.31	12.67	25.98
California red-legged frog	Grassland Oak woodland Riparian woodland Freshwater marsh Creek channel	13.52	12.74	26.26
Alameda whipsnake	Grassland Oak woodland Riparian woodland	13.37	12.72	26.09

Source: Caltrans, 2014g

transient, individuals entering the BSA from being directly, physically harmed or injured by construction activities or equipment, the Build Alternative is **Not Likely to Adversely Affect** the essential behavioral patterns of this species, including breeding, foraging, or migration. No direct impact to suitable habitat for the San Joaquin kit fox through the destruction of foraging or denning habitats is anticipated.

Central California Coast DPS Steelhead

The project **May Affect, and is Likely to Adversely Affect**, the Central California Coast DPS Steelhead. As previously discussed, a fish ladder is scheduled to be installed at the BART weir that would allow for fish passage between San Francisco Bay and the Alameda Creek watershed. As construction of the fish ladder is anticipated to begin in 2016, any steelhead potentially occurring within the BSA are likely to be subject to protection under FESA at the time of project construction. Because fish passage is scheduled to be restored to the Alameda Creek watershed prior to the anticipated start of project construction, this analysis addresses effects to a population of central California coast DPS steelhead that is not currently present within the BSA, but is expected to be present within Alameda Creek at the time of project construction. **Adverse Effects** may result from the following: loss of natural bed or bank; debris transport impedance; short-term release of contaminants; loss or decline of riparian habitat; decline of vegetative diversity; loss of in-stream channel habitat; change to, or loss of natural bed substrate; direct take of fish; hydroacoustic effects[3] to fish by pile driving; and loss of shading from riparian vegetation. Steelhead could be indirectly affected by erosion or sedimentation during construction, since water quality is an important aspect of steelhead habitat.

No new barriers to fish passage would be introduced as a result of the Build Alternative. Alameda Creek will be temporarily diverted through a pipe during construction, and would resume free flow under the newly widened bridge after construction is complete. As such, **No Permanent Effects** to passage would result. Phase 1 - Initial Construction Phase and Future Phases

Adverse effects to threatened and endangered species described above for the Build Alternative are applicable to Phase 1 and future phases. The effects summarized in **Table 2.3.5-5** provide impact totals for Phase 1 and future phases, respectively.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-680 within the project limits. The freeway travel lanes along the I-680 corridor would remain as they currently exist and no HOV/express lane in the northbound direction would be constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result

[3] negative effects on fish from underwater sound pressure during pile driving

in impacts to biological resources. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of threatened and endangered animal species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected animal species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of threatened and endangered animal species in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** includes a number of measures that would avoid and minimize adverse effects to the many species within the BSA, including threatened or endangered species. Measures applicable to impacts to threatened and endangered species are cross referenced and/or summarized below.

Formal Consultation

Caltrans initiates consultation with USFWS when a project has the potential to affect a federally listed species. Formal consultation with USFWS under FESA will be initiated with the submission of a Biological Assessment (BA) prepared for the project for the California tiger salamander, California red-legged frog, Alameda whipsnake, and the San Joaquin kit fox). A Biological Opinion (BO) will be obtained from the USFWS prior to project approval.

CESA generally parallels the main provisions of FESA, but extends the take prohibitions to species proposed for listing. Section 2080 of California Fish and Game Code prohibits the take (defined as hunting, pursuing, catching, capturing, or killing) of endangered, threatened, or candidate species unless otherwise authorized by permit. CESA allows for take incidental to otherwise lawful development projects except for those species listed as fully protected. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any listed or candidate species or result in destruction or adverse modification of essential habitat.

The project has the potential to affect the two species listed under CESA; the California tiger salamander and Alameda whipsnake. An Incidental Take Permit from CDFW for these species will be required for the project.

Caltrans also initiates consultation with the NMFS when a project has the potential to affect a federally listed anadromous fish species and/or adversely affect designated critical habitat. As the project has the potential to affect habitat for central California coast DPS steelhead, a federally listed anadromous fish, consultation with the NMFS will be initiated with the submission of a BA prepared for the project. To date, no consultation, either formal or informal, has been initiated with NMFS for this project. **Measure BIO-24, Compliance with**

Biological Opinion, states that Caltrans will include a copy of the biological opinion within its solicitations for design and construction of the proposed project, making the primary contractor aware of all requirements and obligations included within the biological opinion. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the biological opinion. The Resident Engineer or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least 30 calendar days prior to groundbreaking. Prior to ground breaking, the Resident Engineer will submit a letter to the USFWS verifying that they possess a copy of the biological opinion and have read the Terms and Conditions. Implementation of this measure will ensure that required consultation and concurrence with the USFWS is obtained prior to construction.

Compensatory Mitigation

Mitigation Measures BIO-C, BIO-D, and **BIO-E** propose compensatory mitigation for impacts to California tiger salamander, California red-legged frog, and Alameda whipsnake, respectively. An Incidental Take Permit from CDFW for the California tiger salamander and Alameda whipsnake will be required for the project. Caltrans will work with the appropriate regulatory agencies to develop an approved mitigation and monitoring plan with survival success criteria prior to ground disturbance for impacts to habitat for each of these species. A portion of the overall mitigation acreage requirement will be satisfied by restoring temporarily impacted areas (on-site mitigation). The remaining acreage requirement will be satisfied either through purchase of credits, if necessary, at an approved mitigation bank, or through off-site mitigation. Since some species have similar habitat requirements, some mitigation acreage may be considered as having value for several species, and consequently would be applied as multi-species conservation credits when tracking Caltrans' fulfillment of the proposed mitigation.

<u>California Tiger Salamander</u>

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures,** will reduce the potential for effects to California tiger salamander during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), prevention of wildlife entrapment (**Measure BIO-4**), wildlife exclusion fencing (**Measure BIO-5**), and pre-construction surveys (**Measure BIO-8**).

Water quality during construction and project operation would be protected by BMPs that would be developed approved prior to construction (see **Section 2.2.2, Water Quality, Measures WQ-1, WQ-2,** and **WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA were maintained for California tiger salamanders that could be present in or near this aquatic habitat.

Mitigation Measure BIO-B: Compensatory Mitigation for the California Tiger Salamander. In order to meet the requirements of California Fish and Game Code Section 2081 for obtaining an Incidental Take Permit for the California tiger salamander, compensatory mitigation is proposed to satisfy the conditions of multiple agencies and jurisdictions including FESA and the CEQA process. **Table 2.3.5-2** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on- and off-site restoration of California tiger salamander habitat, isolating the Phase 1 and future phase calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Table 2.3.5-2 Proposed Compensatory Mitigation for the California Tiger Salamander Affected by the Build Alternative

Feature Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)	1:1 Ratio (Acres)	3:1 Ratio (Acres)	Total Mitigation (Acres)
Phase 1					
Grassland	8.14	10.45	8.14	31.35	39.49
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Phase 1 Total	8.79	11.02	8.79	33.06	41.85
Future Phases					
Grassland	4.52	1.65	4.52	4.95	9.47
Future Phases Total	4.52	1.65	4.52	4.95	9.47
Build Alternative Total					
Grassland	12.66	12.10	12.66	36.30	48.96
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Build Alternative Total	13.31	12.67	13.31	38.01	51.32

Source: Caltrans, 2014g

Mitigation Measure BIO-B, in combination with the avoidance and minimization measures listed above, would reduce effects to California tiger salamander to a negligible level, and may be used to satisfy the conditions of multiple agencies and jurisdictions.

<u>California Red-Legged Frog</u>

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** will reduce the potential for effects to California red-legged frog during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), prevention of wildlife entrapment (**Measure BIO-4**), wildlife exclusion fencing (**Measure BIO-5**), pre-construction surveys (**Measure BIO-8**), and the prohibition of monofilament plastic (**Measure BIO-2**).

Water quality during construction and project operation would be protected by BMPs that would be developed approved prior to construction (see **Section 2.2.2, Water Quality, Measures WQ-1, WQ-2,** and **WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA were maintained for California red-legged frogs that could be present in or near this aquatic habitat.

Mitigation Measure BIO-C: Compensatory Mitigation for the California Red-Legged Frog. In order to meet the requirements of the U.S. Fish and Wildlife Service for the California red-legged frog, compensatory mitigation is proposed. **Table 2.3.5-3** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on- and off-site restoration of California red-legged frog habitat, isolating the Phase 1 and future phase calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Table 2.3.5-3 Proposed Compensatory Mitigation for the California Red-legged Frog Affected by the Build Alternative

Feature Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)	1:1 Ratio (Acres)	3:1 Ratio (Acres)	Total Mitigation (Acres)
Phase 1					
Grassland	8.14	10.45	8.14	31.35	39.49
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Creek Channel	0.10	0.01	0.10	0.03	0.13
Phase 1 Total	8.95	11.08	8.95	33.24	42.19
Future Phases					
Grassland	4.52	1.65	4.52	4.95	9.47
Freshwater Marsh	0.05	0.01	0.05	0.03	0.08
Future Phases Total	4.57	1.66	4.57	4.98	9.55
Build Alternative Total					
Grassland	12.66	12.10	12.66	36.30	48.96
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Freshwater Marsh	0.05	0.01	0.05	0.03	0.08
Creek Channel	0.10	0.01	0.10	0.03	0.13
Build Alternative Total	13.52	12.74	13.52	38.22	51.74

Source: Caltrans, 2014g

Mitigation Measure BIO-C, in combination with the avoidance and minimization measures listed above, would reduce effects to California red-legged frog to a negligible level, and may be used to satisfy the conditions of multiple agencies and jurisdictions.

Alameda Whipsnake

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** will reduce the potential for effects to Alameda whipsnake during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), prevention of wildlife entrapment (**Measure BIO-4**), wildlife exclusion fencing (**Measure BIO-5**), pre-construction surveys (**Measure BIO-8**), and the prohibition of monofilament plastic (**Measure BIO-27**).

Mitigation Measure BIO-D: Compensatory Mitigation for the Alameda Whipsnake. In order to meet the requirements of California Fish and Game Code Section 2081 for obtaining an Incidental Take Permit for the Alameda whipsnake, compensatory mitigation is proposed. **Table 2.3.5-4** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on- and off-site restoration of Alameda whipsnake, isolating the Phase 1 and future phases calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Table 2.3.5-4 Proposed Compensatory Mitigation for the Alameda Whipsnake Affected by the Build Alternative

Feature Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)	1:1 Ratio (Acres)	3:1 Ratio (Acres)	Total Mitigation (Acres)
Phase 1					
Grassland	8.14	10.45	8.14	31.35	39.49
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Phase 1 Total	8.85	11.07	8.85	33.21	42.06
Future Phases					
Grassland	4.52	1.65	4.52	4.95	9.47
Future Phases Total	4.52	1.65	4.52	4.95	9.47
Build Alternative Total					
Grassland	12.66	12.10	12.66	36.30	48.96
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Build Alternative Total	13.37	12.72	13.37	38.16	51.53

Source: Caltrans, 2014g

Mitigation Measure BIO-D, in combination with the avoidance and minimization measures listed above, would reduce effects to Alameda whipsnake to a negligible level, and may be used to satisfy the conditions of multiple agencies and jurisdictions.

<u>San Joaquin Kit Fox</u>

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** will reduce the potential for effects to San Joaquin kit fox during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), prevention of wildlife entrapment (**Measure BIO-4**), wildlife exclusion fencing (**Measure BIO-5**), and pre-construction surveys (**Measure BIO-8**).

No compensatory mitigation is proposed for the San Joaquin kit fox as the potential for adverse effect is negligible.

<u>Central California Coast DPS Steelhead</u>

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** will reduce the potential for effects to steelhead during project construction. Measures relevant to steelhead include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-4**), and work restrictions within Alameda Creek (**Measure BIO-13**).

Water quality during construction and project operation would be protected by BMPs that would be developed approved prior to construction (see **Section 2.2.2, Water Quality, Measures WQ-1, WQ-2,** and **WQ-3** for further details regarding temporary and permanent BMP). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA were maintained for steelhead that could be present in Alameda Creek.

As previously discussed, consultation with NMFS would address ESA compliance in the event that remaining downstream anadromous fish passage is restored prior to completion of the proposed project. As the NEPA-assigned federal action agency, Caltrans will follow the FHWA policy of mitigating for impacts to special-status species and habitats. Such mitigation, if necessary, will be developed during the permitting phase of this project. Because these fish are prevented from leaving the watershed by the existing BART weir, they are not currently considered to be anadromous central California coast DPS steelhead and do not receive protection under FESA. Instead, they are considered to be landlocked rainbow trout. If the fish passage is not constructed, no mitigation would be required.

Phase 1 - Initial Construction Phase and Future Phases

Avoidance, minimization, and mitigation measures described above for the Build Alternative are applicable to Phase 1 and future phases. Anticipated mitigation ratios provide totals for Phase 1 and future phases, respectively.

2.3.6 INVASIVE SPECIES

REGULATORY SETTING

On February 3, 1999, President William J. Clinton signed Executive Order (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." Federal Highway Administration (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 National Environmental Policy Act (NEPA) analysis for a proposed project.

AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the project (Caltrans, 2014g). As described in **Section 2.3.1, Natural Communities**, invasive grasses and ruderal vegetation within the BSA are present throughout much of Caltrans' right-of-way.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The Build Alternative is expected to have a minimal effect on the distribution of invasive species within the BSA. The area is currently colonized by numerous invasive species of plant and wildlife, and the proposed improvements are not expected to result in the colonization of additional species. None of the species on the California list of noxious weeds is currently used by Caltrans for erosion control or landscaping.

In order to promote native species within the BSA, the sensitive natural communities would be re-vegetated with native plant species.

Phase 1 - Initial Construction Phase and Future Phases

The minimal effects related to invasive species for the Build Alternative are applicable to Phase 1 and future phases.

No-Build Alternative

The No-Build Alternative will make no physical or operational improvements to I-680 or the connecting roadways within the BSA. Implementation of the currently planned and funded projects outside the BSA but within Alameda County will have the same potential to introduce or spread invasive species into currently un-infested areas. Transportation projects will be subject to the same avoidance measures prescribed by Caltrans and EO 13112, thereby reducing adverse effects related to the spread of invasive species.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures,** will reduce the potential to introduce or spread invasive species during project construction. **Measures BIO-28** and **BIO- 30** require all construction activities and revegetation efforts follow EO 13112, thereby reducing adverse effects related to the spread of invasive species.

Phase 1 - Initial Construction Phase and Future Phases

No additional avoidance, minimization, or mitigation measures would be required for Phase 1 or future phases.

No-Build Alternative

The No-Build Alternative will make no physical or operational improvements to I-680 or the connecting roadways within the BSA. Implementation of the currently planned and funded projects outside the BSA but within Alameda County will have the same potential to introduce or spread invasive species into currently un-infested areas. Transportation projects will be subject to the same avoidance measures prescribed by Caltrans and EO 13112, thereby reducing potential adverse effects related to the spread of invasive species.

2.3.7 AVOIDANCE AND MINIMIZATION MEASURES AND PROJECT MITIGATION MEASURES

AVOIDANCE AND MINIMIZATION MEASURES

To avoid and minimize effects to sensitive species and their habitats within the BSA, Caltrans would implement the general avoidance and minimization measures described below. The measures would be included as part of the special provisions of the construction bid package as measures that would implemented during construction. These measures apply to all of the proposed improvements under the Build Alternative, including Phase 1 and future phases. These measures will include minimizing the area of impact, installing wildlife exclusion fencing, implementing work windows, conducting environmental education for the construction crews, conducting preconstruction surveys, requiring presence of an on-site biological monitor during designated periods, and other construction-site best management practices (BMPs).

Measure BIO-1: Biological Monitor Approval. Caltrans will submit the names and qualifications of the biological monitor(s) for USFWS and CDFW approval prior to initiating construction activities for the proposed project.

Measure BIO-2: Biological Monitoring. The agency-approved biologist(s) will be on-site during initial ground-disturbing activities, and thereafter as needed to fulfill the role of the approved biologist as specified in project permits. The biologist(s) will keep copies of applicable permits in their possession when onsite. Through the Resident Engineer or their designee, the agency-approved biologist(s) shall be given the authority to communicate either verbally, by telephone, email or hardcopy with all project personnel to ensure that take of listed species is minimized and permit requirements are fully implemented. Through the Resident Engineer or their designee, the agency-approved biologist(s) shall have the authority to stop project activities to minimize take of listed species, or if he/she determines that any permit requirements are not fully implemented. If the agency-approved biologist(s) exercises this authority, the agencies shall be notified by telephone and email within 24 hours. **Measure BIO-3: Worker Environmental Awareness Training.** All construction personnel will attend a mandatory environmental education program delivered by an agency-approved biologist prior to working on the project.

Measure BIO-4: Prevention of Wildlife Entrapment. To prevent inadvertent entrapment of special-status species during construction, excavated holes or trenches more than one-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 special-status 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.

Measure BIO-5: Wildlife Exclusion Fencing. The limits of construction zones within suitable habitat for special-status species will be delineated with high visibility wildlife exclusion fencing at least four feet in height to prevent wildlife from accessing the construction footprint. The fencing will be removed only when all construction equipment is removed from the site. No project activities will occur outside the delineated project construction area. Wildlife exclusion fencing is not required for construction activities occurring outside of suitable habitat for special-status species.

Measure BIO-6: Work Window within Aquatic Features. Construction activities that would disturb soil or have the potential to result in siltation to water bodies will be limited to the summer season, defined as April 15 to October 15, to avoid peak rainy periods. This measure does not apply to work in Alameda Creek, which has a more restrictive work window due to the potential presence of listed fish species (see Measure BIO-13).

Measure BIO-7: Work Window for Nesting Birds. To the extent practicable, clearing and grubbing activities will be conducted during the non-nesting season, from September 2 to February 14.

Measure BIO-8: Pre-construction Surveys. Prior to any ground disturbance that occurs between Koopman Road and SR 238, or between Scott Creek Road and SR 262, pre-construction surveys will be conducted by an agency-approved biologist for special-status species. These surveys will consist of walking surveys of the project limit. The biologist(s) will investigate all potential cover sites. This includes thorough investigation of mammal burrows, rocky outcrops, appropriately sized soil cracks, and debris. If any listed species are detected during preconstruction surveys, the USFWS, and/or the CDFW and the NMFS will be notified as appropriate within 48 hours.

Measure BIO-9: Pre-construction Surveys for Nesting Birds. Pre-construction surveys for nesting birds will be conducted by a qualified biologist no more than 72 hours prior to the start of any construction activities occurring during the breeding season (February 15 to September1).

Measure BIO-10: Non-Disturbance Buffer for Nesting Birds. A no-work buffer will be established 300 feet of active raptor nests and 50 feet of active passerine nests. These distances may be increased or decreased on a case-by case basis depending on the nest location, topography, cover, the species' sensitivity to disturbance, and the intensity/type of potential disturbance.

If rescheduling of work around active bird nests is infeasible, CDFW will be consulted. If CDFW approval is obtained, a qualified biologist will monitor nests for signs of disturbance. If it is determined that project activities are resulting in nest disturbance, work will cease immediately.

Measure BIO-11: Occupancy Surveys for Western Burrowing Owl. Occupancy surveys, as defined in the Staff Report on Burrowing Owl Mitigation (CDFW 2012), shall be conducted by a qualified biologist prior to ground-disturbing activity. If burrowing owls are found to occupy habitat in or adjoining the project limits, avoidance and minimization measures will be determined in consultation with CDFW.

Measure BIO-12: Dusky-Footed Woodrat Surveys. A qualified biologist will conduct a preconstruction survey of the BSA prior to the start of construction in woodland areas to determine if woodrat nests are present within areas of temporary and permanent impact. The need for nest dismantling and relocation will be determined by Caltrans in coordination with CDFW.

Measure BIO-13: Work within Alameda Creek.

- *Work Window*. Work within the bed, bank, and channel of Alameda Creek shall be restricted to the period between June 1 and October 15, in order to avoid salmonid spawning and migration season.

- *Creek Diversion*. Contractor will submit a creek diversion plan prior to working in the stream for regulatory approval.

- *Pollution/Siltation Prevention*. Flow diversions shall reduce pollution and/or siltation to greatest extent possible. Flows to downstream reaches shall be provided during all times that the natural flow would have supported aquatic life. Said flows shall be sufficient quality and quantity and of appropriate temperature to support fish and other aquatic life both above and below the diversion.

- *Fish Relocation*. An agency-approved biologist shall check daily for stranded aquatic life as the water level in any dewatering areas drops. All reasonable efforts shall be made to capture and move all stranded aquatic life observed in the dewatering area. Capture methods may include electrofishing, hand-held seines, dip nets, buckets, and by hand. Captured aquatic life shall be released downstream of the project.

Measure BIO-14: Bat Disturbance during Bridge Widening. At all bridge widening locations, combustion equipment, such as generators, pumps, and vehicles, are not to be parked nor operated under the bridge unless they are required to be in contact or close proximity to activities under the bridge. Personnel shall minimize their presence directly under known bat roost sites.

Measure BIO-15: Bat Surveys at Alameda Creek Bridge. A survey for bat day roosts shall be conducted at least one year prior to the scheduled demolition and widening work on the Alameda Creek Bridge. The survey shall consist of five visits total, one each in the following windows:

- day roost assessment (any time of year)
- early summer (May 1-June 30)
- mid-summer (July 15-August 15)
- late summer (August 25 - September 30)
- winter (October 16 - February 28)

The day roost assessment will be conducted during the daytime prior to the other visits, and will identify specific features of the bridge that could serve as entrances to day roosts (such as cracks, crevices, expansion joints, and weep holes). If possible, the interior of potential day roosts should be visually inspected for bats. This will also identify the level of effort (i.e. number of surveyors and/or bat detectors) needed for full coverage of all potential day roosts.

The early summer, mid-summer, late summer, and winter visits will consist of monitoring all potential day roost entrances for a survey period beginning one half hour before sunset and ending one hour after sunset. Surveyors will watch the potential day roost entrances throughout the survey period, and document any observations of bats flying into or out of the entrances. If surveyors cannot watch all potential day roost entrances simultaneously, then bat acoustical detectors may be used where surveyors are not available. If necessary, multiple visits will be conducted within any given survey window until all potential day roosts have been adequately surveyed. California Fish and Game Code Section 4150 states that all non-game mammals or parts thereof may not be taken or possessed except as provided otherwise in the code or in accordance with regulations adopted by CDFW. Activities resulting in mortality of non-game mammals or disturbances that cause the loss of a bat species may be considered take by CDFW and are subject to compensatory mitigation. The need for compensatory mitigation for bats will depend on whether or not day roosts are identified that will be impacted by project activities, and will be addressed in coordination with CDFW during the permitting for the project.

Measure BIO-16: Riparian Tree Removal. A qualified biologist shall assess trees within the riparian corridor of Alameda Creek for suitable bat habitat within 30 days of tree removal. Examples of suitable roosting habitat include knotholes, exfoliating bark, crevices at the ends of broken branches, cavities formed by decay, and holes created by woodpecker activity. If the habitat assessment reveals suitable bat habitat and tree removal is scheduled from April 16 through August 30 and/or October 16 through February 28 then presence/absence surveys shall be conducted two to three days prior to tree removal. If presence/absence surveys are negative then tree removal may be conducted by following the two-phased tree removal system as specified below. If presence/absence surveys indicate bat occupancy then the occupied trees shall only be removed from March 1 through April 15 and/or August 31 through October 15 by following the two-phased tree removal system. The two-phased removal system shall be conducted over two consecutive days. The first day (in the afternoon), limbs and branches are removed by a tree cutter using chainsaws or other hand tools only. Limbs with cavities, crevices or deep bark fissures are avoided, and only branches or limbs without those features are removed. On the second day, the entire tree shall be removed.

Measure BIO-17: Vehicle Use. Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

Measure BIO-18: Night Work. To the extent practicable, nighttime construction will be minimized.

Measure BIO-19: Night Lighting. Artificial lighting of the work area during nighttime hours will be minimized to the maximum extent practicable.

Measure BIO-20: Trash Control. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the work area.

Measure BIO-21: Firearms. No firearms will be allowed in the action area except for those carried by authorized security personnel, or local, state, or Federal law enforcement officials.

Measure BIO-22: **Pets.** To prevent harassment, injury or mortality of sensitive species, no pets will be permitted on the project site.

Measure BIO-23: Tree Preservation. Specific tree preservation measures related to the local regulatory tree ordinances shall be addressed during the permitting phase of the project. Trees within Caltrans right-of-way are under state control, and are not subject to local regulations.

Measure BIO-24: Compliance with the Biological Opinion. Caltrans will include a copy of the biological opinion within its solicitations for design and construction of the proposed project, making the primary contractor aware of all requirements and obligations included within the biological opinion, and to educate and inform all other contractors involved in the project as to the requirements of the biological opinion. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the biological opinion. The Resident Engineer or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least 30 calendar days prior to groundbreaking. Prior to ground breaking, the Resident Engineer will submit a letter to the USFWS verifying that they possess a copy of the biological opinion and have read the Terms and Conditions.

Measure BIO-25: Listed Species on Site. The Resident Engineer will immediately contact the agency-approved project biologist(s) in the event that Alameda whipsnake, California red-legged frog, California tiger salamander, or San Joaquin kit fox is observed within a construction zone. The Resident Engineer will suspend construction activities within a 50-foot radius of the animal until it leaves the site voluntarily or an agency-approved protocol for removal has been established.

Measure BIO-26: Work Window for California Tiger Salamander. Construction activities that would disturb soil within suitable habitat for California tiger salamander will occur between April 15 and October 15, when the species is unlikely to be active and there is lower potential for an individual to enter the work area.

Measure BIO-27: Monofilament Erosion Control. Plastic monofilament netting (erosion control matting) or similar material will not be used for the project because Alameda whipsnakes, California red-legged frogs, and California tiger salamanders may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

Measure BIO-28: Invasive Species. In compliance with the Executive Order on Invasive Species, EO 13112, and guidance from the Federal Highway Administration (FHWA), 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.

Measure BIO-29: Colonial Bird Nesting Deterrence Plan. At bridges where colony-nesting birds such as cliff swallows occur, a plan shall be developed to deter their nesting prior to the start of construction. Only nests in areas that will be directly impacted by bridge widening activities will be deterred. If birds build nests on parts of the bridge that will not be directly impacted by bridge widening, those birds will be allowed to nest and construction activities shall avoid disturbance to those nests. If netting is used as a bird deterrent, it must be of proper mesh size to ensure that it does not entangle birds, and installed in such a way as to ensure that it does not cause entrapment of birds.

Measure BIO-30: Revegetation Following Construction. All areas that are temporarily affected during construction will be revegetated with an assemblage of native grass, shrub, and tree species to restore habitat values. Invasive, exotic plants will be controlled within the BSA to the maximum extent practicable pursuant to Executive Order 13112.

Measure BIO-31: Seasonally Timed Rare Plant Pre-construction Surveys. In the year prior to the beginning of any ground disturbance for the project, a seasonally-timed rare-plant survey will be conducted by a qualified biologist. The survey requires two site visits to cover the blooming periods for rare plants that have potential to occur within the project limits. One survey must be completed between March and April for early-blooming plants, and the second must be completed between June and August for late-blooming plants. Surveys are only required in areas identified as suitable habitat for rare plants, which includes between Koopman Road and North Mission Boulevard (SR 238), or on the northbound side of I-680 between Scott Creek Road and SR 262.

Measure BIO-32: Roosting Bat Exclusion at Alameda Creek Bridge. If bat day roosts are identified, then CDFW shall be consulted regarding the appropriate course of action. If deemed appropriate, roost exclusion measures may be put in place at those day roost entrances. Exclusion measures shall only be placed during the period from March 1 to April 15, in order to avoid both the breeding season and hibernation season. Examples of exclusion measures include flaps or doors fitted into roost entrances. No bird netting of any kind shall be used for bat exclusion. These exclusion measures shall be monitored and maintained in working order until demolition activities on the bridge remove the roosting locations.

If no day roosts are identified during surveys that would be directly destroyed by demolition or widening activities, then exclusion measures are not necessary. Exclusion measures shall not be used on day roosts that will not be directly destroyed by demolition or widening activities, regardless of the level of construction disturbance that will occur. Construction disturbance near a roost location is not sufficient justification for exclusion.

Measure BIO-33: Avoid or Minimize impacts on Oak Woodlands. Orange construction barrier fencing will be installed to identify environmental sensitive areas (ESAs), including oak woodlands, present within the BSA but that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and be removed after completion of construction.

MITIGATION MEASURES

Compensatory mitigation as described below will minimize adverse effects to natural communities, wetlands and other waters and threatened and endangered species to a negligible level. As part of the project, Caltrans will work with the appropriate regulatory agencies to develop an approved mitigation and monitoring plan with survival success criteria prior to ground disturbance for impacts to habitat for California tiger salamander, California red-legged frog, and Alameda whipsnake. A portion of the overall mitigation acreage requirement will be satisfied by restoring temporarily impacted areas (on-site mitigation). The remaining acreage requirement will be satisfied either through purchase of credits if necessary at an approved mitigation bank, or through off-site mitigation. Since some species have similar habitat requirements, some mitigation acreage may be considered as having value for several species, and consequently would be applied as multi-species conservation credits when tracking Caltrans' fulfillment of the proposed mitigation.

Mitigation Measure BIO-A: Compensatory Mitigation for Jurisdictional Water Features. Any impacts to jurisdictional water features that cannot be recreated on-site shall be subject to formalized mitigation requirements of the regulatory agencies. A conceptual restoration and mitigation plan shall be prepared prior to permit applications to regulatory agencies. The on-site restoration of Waters of the U.S. combined with the implementation of other components of the conceptual restoration and mitigation plan will ensure no net loss of functions and values of Waters of the U.S.

The off-site mitigation ratio proposed for Waters of the U.S., including wetlands, under jurisdiction of the USACE, is 1:1 acres of mitigation per acre of permanent impact. The mitigation ratio proposed for temporary impacts is 1:1 acre of mitigation per acre of temporary impact. All of the mitigation for temporary impacts is anticipated to be achieved on-site by restoring impacted areas to pre-project conditions. Final impact quantities and required mitigation will be determined during the permitting process with USACE.

Off-site mitigation for permanent impacts is proposed through purchase of credits at an approved mitigation bank. A conceptual on-site restoration and mitigation plan would be included in the permit applications to regulatory agencies. This plan would include a native plant palette list, plant establishment period, success criteria, and a monitoring and reporting schedule that would be reviewed and approved by the regulatory agencies prior to project construction. In addition, under Section 401 of the Clean Water Act, the RWQCB may request or require mitigation as part of the Water Quality Certification. Caltrans would obtain this certification during the permitting phase of project development.

Mitigation Measure BIO-B: Compensatory Mitigation for the California Tiger Salamander. In order to meet the requirements of California Fish and Game Code Section 2081 for obtaining an Incidental Take Permit for the California tiger salamander, compensatory mitigation is proposed to satisfy the conditions of multiple agencies and jurisdictions including FESA and the CEQA process. **Table 2.3.7-1** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on- and off-site restoration of California tiger salamander habitat, isolating the Phase 1 and future phase calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Table 2.3.7-1 Proposed Compensatory Mitigation for the California Tiger Salamander Affected by the Build Alternative

Feature Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)	1:1 Ratio (Acres)	3:1 Ratio (Acres)	Total Mitigation (Acres)
Phase 1					
Grassland	8.14	10.45	8.14	31.35	39.49
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Phase 1 Total	**8.79**	**11.02**	**8.79**	**33.06**	**41.85**
Future Phases					
Grassland	4.52	1.65	4.52	4.95	9.47
Future Phases Total	**4.52**	**1.65**	**4.52**	**4.95**	**9.47**
Build Alternative Total					
Grassland	12.66	12.10	12.66	36.30	48.96
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Build Alternative Total	**13.31**	**12.67**	**13.31**	**38.01**	**51.32**

Source: Caltrans, 2014g

Mitigation Measure BIO-C: Compensatory Mitigation for the California Red-Legged Frog. In order to meet the requirements of the U.S. Fish and Wildlife Service for the California red-legged frog, compensatory mitigation is proposed. **Table 2.3.7-2** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on- and off-site restoration of California red-legged frog habitat, isolating the Phase 1 and future phase calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Table 2.3.7-2 Proposed Compensatory Mitigation for the California Red-legged Frog Affected by the Build Alternative

Feature Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)	1:1 Ratio (Acres)	3:1 Ratio (Acres)	Total Mitigation (Acres)
Phase 1					
Grassland	8.14	10.45	8.14	31.35	39.49
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Creek Channel	0.10	0.01	0.10	0.03	0.13
Phase 1 Total	**8.95**	**11.08**	**8.95**	**33.24**	**42.19**
Future Phases					
Grassland	4.52	1.65	4.52	4.95	9.47
Freshwater Marsh	0.05	0.01	0.05	0.03	0.08
Future Phases Total	**4.57**	**1.66**	**4.57**	**4.98**	**9.55**
Build Alternative Total					
Grassland	12.66	12.10	12.66	36.30	48.96
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Freshwater Marsh	0.05	0.01	0.05	0.03	0.08
Creek Channel	0.10	0.01	0.10	0.03	0.13
Build Alternative Total	**13.52**	**12.74**	**13.52**	**38.22**	**51.74**

Source: Caltrans, 2014g

Mitigation Measure BIO-D: Compensatory Mitigation for the Alameda Whipsnake. Compensatory mitigation is proposed and may be used to satisfy the conditions of multiple agencies and jurisdictions including FESA, CESA, and the CEQA process. **Table 2.3.7-3** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on- and off-site restoration of Alameda whipsnake, isolating the Phase 1 and future phases calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Table 2.3.7-3 Proposed Compensatory Mitigation for the Alameda Whipsnake Affected by the Build Alternative

Feature Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)	1:1 Ratio (Acres)	3:1 Ratio (Acres)	Total Mitigation (Acres)
Phase 1					
Grassland	8.14	10.45	8.14	31.35	39.49
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Phase 1 Total	**8.85**	**11.07**	**8.85**	**33.21**	**42.06**
Future Phases					
Grassland	4.52	1.65	4.52	4.95	9.47
Future Phases Total	**4.52**	**1.65**	**4.52**	**4.95**	**9.47**
Build Alternative Total					
Grassland	12.66	12.10	12.66	36.30	48.96
Oak Woodland	0.65	0.57	0.65	1.71	2.36
Riparian Woodland	0.06	0.05	0.06	0.15	0.21
Build Alternative Total	**13.37**	**12.72**	**13.37**	**38.16**	**51.53**

Source: Caltrans, 2014g

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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 the 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 limits 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.

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

2.4.2 CUMULATIVE ANALYSIS

This cumulative analysis determines whether the Build Alternative in combination with other approved or foreseeable projects would result in a cumulative effect, and, if so, whether the Build Alternative's contribution to the cumulative impact would be considerable. Reasonably foreseeable future projects include land use developments and other transportation improvements that are planned and funded and would be located near the proposed Build Alternative improvements.

Under the No-Build Alternative, no changes to the project corridor would occur as a result of project implementation. The freeway travel lanes along the I-680 corridor would remain as they currently exist and no HOV/express lane in the northbound direction would be constructed. As such, the No-Build Alternative would not contribute to any cumulative effects, and is not discussed further in this analysis.

Methodology

The following two methods were used to evaluate whether the Build Alternative would have a considerable contribution to a significant cumulative effect:

1. Projects to consider in the cumulative analysis include any past, present, and probable future projects producing related or cumulative impacts, including projects outside the control of the lead agency, or
2. The cumulative analysis would consider projections contained in an adopted local, regional, or statewide plan, or would use a prior environmental document which has been adopted or certified for such a plan.

For the majority of this analysis the second method was used, based on the City of Milpitas General Plan and City of Fremont's General Plan and associated EIR. Where indicated, the cumulative analysis is enhanced through the consideration of specific individual projects identified from a list compiled from both the Cities of Milpitas and Fremont. As discussed in **Section 2.1.1, Land Use,** there are 27 planned land use developments, which are listed in **Table 2.4.2-1**. **Figures 2.1-2a** and **2.1-2b** in **Section 2.1.1, Land Use**, depict the locations of these development projects in Milpitas and Fremont, respectively. The predominant type of planned land use development in the area is residential. Other development projects planned in the area include several institutional, commercial, and mixed-use commercial/residential land uses. Construction is also underway for the new Bay Area Rapid Transit (BART) alignment from the Warm Springs area to the Berryessa station in San Jose.

The following planned and approved transportation improvements along local routes may be implemented by local agencies or under other projects:

- **I-680 Ramp Metering Project**

  As part of the Freeway Performance Initiative (FPI) Program, ramp metering and traffic operation system facilities will be installed at various locations on I-680 and in both directions between US highway101 (US 101) in Santa Clara County and Interstate-580 (I-580) in Alameda County. These improvements will be phased over several contracts. Construction began in April 2013.

- **I-680 Pavement Rehabilitation Project**

  Existing pavement on northbound I-680 will be rehabilitated from the Santa Clara County Line (south of Scott Creek Road) in the City of Fremont to the Koopman Road interchange in the community of Sunol, in Alameda County. These rehabilitation improvements will include overlaying the existing road surface, replacing failed pavement areas, replacing distressed bridge approach concrete slabs, and upgrading curb ramps to new Americans with Disability Act (ADA) standards.[1] These improvements are expected to be constructed concurrently with the proposed I-680 northbound express lane project.

- **I-680 Northbound Express Lane Extension (from SR 84 to south of Alcosta Boulevard)**

  Northbound I-680 will be widened from SR 84 (East) to just south of Alcosta Boulevard to construct a new High Occupancy Vehicle (HOV)/express lane. Constructing the additional lane will provide a continuous four lane facility on northbound I-680 in Alameda County, as well as improve local and regional traffic connections while reducing congestion. Planning for this project is expected to begin in 2015.

- **I-680 Express Lanes Project, Bay Area Infrastructure Financing Authority (BAIFA) (HOV conversion from Rudgear Road to Alcosta Boulevard in the southbound direction and from Alcosta Boulevard to Livorna Road in the northbound direction)**

  The existing HOV lanes on northbound I-680 will be converted to an express lane from Alcosta Boulevard to Livorna Road, in Contra Costa County. No widening or additional lanes will be added to the freeway. This conversion project will include striping lanes and installing sign gantries, signage, FasTrak® toll tag readers, and traffic monitoring video cameras. In addition, equipment and observation areas will be installed to help the California Highway Patrol enforce proper use of the lane. Construction is expected to be completed in 2016.

- **SR 84 Expressway Widening Project (Ruby Hills Drive to Jack London Boulevard)**

  SR 84 will be widened and upgraded from Ruby Hills Drive to Jack London Boulevard, in the City of Livermore. These improvements are designed to improve capacity and local traffic circulation; ease congestion; and provide increased safety in the area for pedestrian and bicycle access. The improvements will be constructed in two segments. The north segment will widen SR 84 from two lanes to four lanes between Concannon Boulevard and Stanley Boulevard, and widen to six lanes between Stanley Boulevard and Jack London Boulevard. The south segment would widen SR 84 to four lanes between Ruby Hill Drive and Concannon Boulevard. Construction of the north segment began in 2012. The construction of the south segment is expected to begin in 2015.

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[1] To allow people with disabilities to cross streets safely, state and local governments must provide curb ramps at pedestrian crossings where walkways intersect a curb. To comply with ADA requirements, the curb ramps provided must meet specific standards for width, slope, cross slope, placement, and other features.

- **SR 84 Expressway Widening Project (I-680 to Pigeon Pass)**

  SR 84 (East) will be widened to four lanes between I-680 and Ruby Hills Drive, in Alameda County. These improvements will provide a continuous four- to six-lane facility on SR 84 (East) between I-680 and I-580. The improvements are expected to include modifications to the I-680/SR 84 direct ramp connectors, and construction of auxiliary lanes in both directions of I-680 between Andrade Road and SR 84 (East). Project initiation studies are expected to begin in 2014.

- **I-680/I-880 Cross Connector**

  Preliminary studies identified three potential corridors for further consideration that could provide an improved connection between I-680 and I-880 in southern Alameda County. Potential improvements are expected to include roadway modifications, intersection specific improvements, and traffic system management options. These improvements are currently in the project initiation phase.

- **I-580 Express Lanes (east of I-680)**

  New HOV/express lanes will be constructed on I-580 from Hacienda Drive, in Pleasanton, to just east of the Greenville Road undercrossing, in Livermore, in the eastbound direction; and from Greenville Road to San Ramon Road/Foothill Road, in Dublin, in the westbound direction. These improvements will convert the newly constructed eastbound HOV lane to a double express lane facility, and the westbound HOV lane to a single express lane facility to maximize the efficiency of the HOV lanes and help reduce congestion in the corridor. These improvements are expected to be completed in 2015.

- **Mission Boulevard Streetscape Improvements (between Verde Way and Mission Creek, Fremont)**

  New curbs, gutters, and sidewalks will be installed on the east side of Mission Boulevard, in the City of Fremont. Improvements consist of new bike lanes on both sides of Mission Boulevard, between Verde Way and Mill Creek Road; the installation of two northbound traffic lanes; and the extension of an existing landscaped median island. Improvements will also include new signing, pavement delineation, and landscaping. Construction is expected to begin in 2014.

Cumulative traffic forecasts were based on applications of the Alameda County Transportation Commission (Alameda CTC) Travel Demand Forecasting Model and developed in more detail for the traffic study (refer to **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, for a complete discussion of the traffic model assumptions). Modifications to the model were made to accurately reflect planned and funded land-use development and transportation projects expected to be in place by 2020 and 2040, including the list of planned transportation improvements described above.

No future capital improvements are assumed along northbound I-680, but the model does include the future express lanes along I-580, as well as interchange improvements along I-580 and at the I-680/SR 262 interchange.

ISSUES WITH NO CUMULATIVE EFFECT

If a project would not result in a direct or indirect effect on a resource, then it will not contribute to a cumulative impact on that resource, and does not need to be further evaluated. Land use; parks and recreational facilities; forestry resources; mineral resources; traffic and transportation/pedestrian improvements; and energy conservation were evaluated and determined to have no adverse effect. Refer to **Table 2-1**, **Section 2.1.1, Land Use; Section 2.1.3, Parks and Recreational Facilities**; and **Section 2.2.8, Energy**, for a more detailed evaluation of these resource topics. **Section 2.2.3, Geology/Soils/Seismic/Topography**, includes a detailed discussion of nearby mineral resources deposits for informational purposes.

Certain resources are not vulnerable to incremental/cumulative effects. For example, geological/seismic hazards related to future development in areas surrounding the project limits are site specific and relate to the type of building and building foundation proposed, as well as the soil composition and slope on the site. There is no additive effect of the geological/seismic hazards associated with other approved or foreseeable development and the project, and therefore no further cumulative analysis of this resource is warranted. One other resource topic that is site specific, with no additive effect, includes the risks associated with hazardous materials/hazardous wastes exposure. As such, no further cumulative analysis of hazardous materials/hazardous wastes is warranted.

Table 2.4.2-1 Planned Developments

ID	Name	Location	Description	Use	Status
1	Los Coches Residential	31 South Milpitas Boulevard, Milpitas; south of Calaveras Boulevard and west of South Milpitas Boulevard	The project will construct 80 single-family residential dwellings units on two parcels, totaling 11.3 acres	Residential	Under construction; opening late 2014
2	Sinclair Renaissance	West side of Sinclair Frontage Road, Milpitas; south of the intersection with Los Coches Street.	The project will demolish existing structures and construct 80 detached, two-story residential dwellings, totaling 9.65 acres	Residential	Under construction
3	750 E. Capitol Ave. (SD11-0008)	750 E. Capitol Avenue, Milpitas	The project will construct three 12-story towers with 460 dwelling units, totaling 5.6 acres	Residential	Entitlement approved
4	Milpitas Station	1425 S Milpitas Boulevard, Milpitas	The project will construct 303 dwelling units (single family, town homes, and brownstone) on 12.1 acres	Residential	Entitlement approved
5	Citation	1200 Piper Drive, Milpitas	The project will construct 732 residential dwelling units, totaling16 acres	Residential	Entitlement approved
6	Citation II (Montague)	737 Montague Expressway, Milpitas	The project will construct 381 dwelling units and 5,400 square feet of commercial property	Mixed Use	Entitlement approved
7	Our Lady of Guadalupe	41933 Blacow Road, Fremont	The project will construct an addition to a church. The addition would be 4,436 square feet	Institutional	Entitlement approved

ID	Name	Location	Description	Use	Status
8	SVD – Bryant Street	43342 Bryant Street, Fremont	The project would construct a mixed-use development with one commercial building and two single-family residences on a 15,000 square-foot parcel	Mixed Use	Application was received and currently under preliminary review procedure, no entitlement
9	Bringhurst Property	42425 Mission Boulevard, Fremont; along Palm Avenue, approximately 0.5 mile west of I-680	The project would develop a private street, common area landscaping, and 23 single-family dwelling units	Residential	Open for comment; estimated completion is 2014+
10	Mission Creek Planned District	42186 Palm Avenue, Fremont	The project will construct 42 single-family homes on a 15.8-acre site	Residential	Entitlement approved; under building permit review; estimated completion is 2015
11	Mission Olive Homes	1435 Olive Avenue, Fremont	The project will construct 6 single-family residential dwelling units	Residential	Under construction; estimated completion is 2015
12	Washington Lennar.	3111 Washington Boulevard, Fremont	The project will construct 17 new residential units	Residential	Entitlement approved; estimated completion is 2014
13	Hirsch Property	42800 Caldas Court, Fremont	The project will construct 33 single-family homes on 7.85 acres	Residential	Building permit review; estimated completion is 2015
14	Sabercat Neighborhood Center	2501 Cormack Road, Fremont	The project will construct 55,472 square feet of commercial/office space and 158 residential condominium units on a 12.2-acre site	Mixed-Use	Entitlement approved; estimated completion is 2015+

ID	Name	Location	Description	Use	Status
15	Driscoll Road Town Homes	2817 Driscoll Road, Fremont	The project will construct 24 town house-style condominiums	Residential	Entitlement approved; estimated completion is 2014
16	Durham Market Place Property	Northwest corner of Durham Road and Sabercat Road, Fremont	The project will construct a new 7,000 square-foot shopping area on a 1.87-acre site	Commercial	Entitlement approved; estimated completion is 2014+
17	Lancar Townhomes at Warren	411 East Warren Avenue, Fremont	The project would construct 26 new townhouse-study developments on a 1.3 acre parcel	Residential	Open for comment; estimated completion is 2014+
18	Hackamore Planned District	303 Hackamore Lane, Fremont	The project will construct 4-6 existing dwelling units to 35 residential homes on a 2.3-acre parcel	Residential	Under construction; estimated completion is 2014
19	Laguna Commons	41152 Fremont Boulevard, Fremont	The project would construct a new 4-story, 64-unit affordable/supportive housing development	Residential	Open for comment
20	Villas at Florio	Northeast corner of Fremont Boulevard and Carol Avenue at 41482 Fremont Boulevard, Fremont	The project will construct a new 22-unit townhouse development on a vacant parcel	Residential	Building permit review; estimated completion 2014
21	Convergence House Church	200 Hammond Avenue, Fremont	The project will expand an existing church	Institutional	Entitlement approved; estimated completion 2014
22	Monument Corner	4007 Irvington Avenue, Fremont	The project will construct 6,780 square-foot multi-tenant retail/office building on a vacant lot	Commercial	Under construction; estimated completion 2014

ID	Name	Location	Description	Use	Status
23	Thermofisher Scientific	46500 Kato Road, Fremont	The project will construct a new 275,000 square-foot industrial manufacturing facility on a vacant 22.3-acre parcel	Industrial	Under construction
24	Sisters of the Holy Family	43151 Mission Boulevard, Fremont	The project will develop a 14.8-acre lot with 45 new senior housing and up to 100 new single-family homes	Residential	Open for comment; estimated completion is 2014+
25	St. Joseph	44411 Mission Boulevard, Fremont	The project will construct 16 new single-family homes	Residential	Building permit review; estimated completion is 2014
26	Stengner Development	44009 Osgood Road, Fremont	The project would allow for a 29,180 square foot retail center	Commercial	Open for comment; estimated completion is 2014
27	Central park Terraces (Central park South)	Union Terrace, Fremont	The project will construct 145 detached single-family homes	Residential	Under construction; estimated completion is 2014

Notes: MF = multi-family units; Res. = residential; SF = single family units; ac. = acres; SQF = square feet
Sources: City of Milpitas, Planning Division[2]; City of Fremont, Community Development Department[3]; Caltrans, 2013

[2] City of Milpitas, Planning Division, Development Projects, accessed from http://www.ci.milpitas.ca.gov/government/planning/planning_division.asp# on April 10, 2014.
[3] City of Fremont, Planning Division, Development Activity Table, accessed from https://www.fremont.gov/index.aspx?NID=411 on April 10, 2014.

ISSUES WITH THE POTENTIAL TO CONTRIBUTE TO A CUMULATIVE EFFECT

Community Impacts

Approximately 94 percent of the communities surrounding the project limits qualify as environmental justice communities. The approved and foreseeable transportation improvements and the development listed in **Table 2.4.2-1** would occur within these same environmental justice populations. As such, the adverse effects from the development in these areas could have a disproportionate and cumulative effect on low income or minority populations.

Implementation of the Build Alternative would affect private and public properties listed in **Section 2.1.5, Community Impacts** (see **Table 2.1.5-4**). None of the proposed property acquisitions, construction easements, or utility easements are in areas where there are existing structures or improvements. The remaining portions of these parcels will remain in private ownership. No displacement of any residence or business would be required. The Build Alternative would not result in disproportionate impacts to environmental justice communities, and would not cause the displacement of any minority or low-income residences, businesses, or employees. Additionally, existing public facilities that are available to the community are located beyond the project limits and would not be affected by the Build Alternative. The Build Alternative would not contribute to a cumulative effect on environmental justice communities.

Growth

The cumulative setting for the growth is defined by the communities that encompass or are adjacent to the I-680 corridor, within the project limits. As discussed in **Section 2.1.3, Growth**, the population in the study area is projected to increase as the number of households and jobs are also expected to increase with the implementation of the planned land use development projects in the area. Such growth is planned for in the surrounding communities under the applicable general plans (Milpitas, Fremont, and Pleasanton) and East County Area Plan. The Build Alternative does not propose any changes to the zoning or land use designations along the freeway. While the Build Alternative would improve the flow of traffic access to and from I-680, no new on- or off-ramps to the local roadways would be constructed. Existing access points to the areas surrounding the project limits would remain the same. For these reasons, the Build Alternative would not affect the rate, amount, or type of growth envisioned by the regulating documents and future planned developments in the area. Cumulative effects to growth are not anticipated.

Farmlands

The cumulative setting for agricultural resources includes proposed development within the counties of Santa Clara and Alameda that could convert open space/farmlands to urban land uses. There has been a trend of conversion of farmland to developed land in northern California that has resulted in the loss of substantial areas of farmland. According to the

California Department of Conservation (DOC, 2011), approximately 748 acres of Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) were converted to other uses between 2006 and 2008 in Alameda County, representing approximately 9 percent of the total Important Farmland inventoried in the county. Likewise, approximately 2,501 acres of Important Farmland were converted to other uses in Santa Clara County, representing approximately 7 percent of the total Important Farmland inventoried in the county.

None of the planned land use developments listed in **Table 2.4.2-1** occur near or on farmlands (see **Figure 2.1-2a** and **b**). However, future transportation improvements, particularly the freeway widening projects, along the I-680 corridor are adjacent to farmlands. Conversion of farmland associated with these projects, will contribute to the continued loss of agricultural land in the region. As discussed in **Section 2.1.4, Farmlands**, the Build Alternative would convert a total of 1.21 acres of Unique Farmland, consisting of 0.57-acres acquired for right-of-way and 0.64-acres for a utility easement. The utility easement would also include the conversion of approximately 0.07 acres of land under a Williamson Act contract. This portion of the property is designated as Non-Prime Agricultural Land on the Williamson Act map and is not designated as Farmland under the FMMP; and would be returned to its current state after the construction of the Build Alternative. Given this, the Build Alternative in combination with other planned and approved transportation projects would result in a cumulative effect to farmlands. Farmland acquisitions under the Build Alternative would constitute acquisition of portions (or slivers)[4] of very small linear strips of land abutting the I-680 corridor, where cultivation of agricultural products is limited to non-existent because of the physical constraints associated with freeways (i.e., proximity to high traffic volumes). Because of these conditions, and the relatively small acquisition anticipated, the farmland acquisition anticipated under the Build Alternative would not be a considerable contribution to the cumulative effect associated with the permanent loss of agricultural land in the region.

Utilities/Emergency Services

The cumulative setting for utilities and emergency services includes the service areas of the particular utility and public service providers that encompass the project limits. Electricity is provided by PG&E; water and wastewater services are provided by a combination of local special districts and private companies whose service areas extend well beyond the immediate boundaries of the project limits. Police and fire services are provided either by City agencies, whose jurisdiction spans the entirety of the affected cities, or by local agencies, who serve incorporated communities along the I-680 corridor. As discussed in **Section 2.1.3, Growth**, the population in the study area is projected to increase as the number of households and jobs are also expected to increase with the implementation of the planned land use development projects listed in **Table 2.4.2-1**. Based on the available environmental documents prepared for these projects and in the City's general plans, increased demands on the utilities and public services with implementation of these planned developments are

[4] A sliver acquisition is a partial acquisition of a parcel or strip of land.

accounted for in the local planning documents (i.e., general plans and Urban Water Management Plans) and through the payment of developer fees. Water supply agencies, such as the Santa Clara Valley Water District and the Alameda County Water District provide exact delivery commitments on a three-year delivery based, in part, on projections made by the Cities.

As individual land use development projects are proposed, specific project-related effects related to the provision of utilities and public services are or will be evaluated within the context of maintaining existing levels of service, budgetary constraints, and the long-term plans of service providers to adjust to anticipated population and employment growth within the region.

Future transportation projects, including the Build Alternative, are not anticipated to directly increase population in the surrounding communities, and would not contribute to a permanent increase demand for these services. Given that utility demand and public services is accounted for in planning and resource documents that predict future demand and supply of such services, and that the transportation projects would not directly increase population in the area, no cumulative effect to utilities and emergency services would occur.

Visual/Aesthetics

The area of cumulative setting for effects related to visual resources and aesthetics includes the viewshed, or the visible environment, surrounding the project limits. The majority of future land use development surrounding the project limits (listed in **Table 2.4.2-1**) will involve redevelopment of existing areas or infill development of vacant lots within urbanized areas. The planned development listed in the table, are infill projects located in urban portions of the Cities. These projects are generally consistent with the Milpitas and Fremont General Plan, and the character of the surround areas. Based on the available environmental documents, changes to visual character associated with these projects are local, and would be noticeable in the immediate surrounding area. Tree replacement would occur for those projects that remove a substantial number of trees. The area for most of the proposed developments is relatively flat; however for those project constructed along the hillside in Fremont (ID Nos. 9, 10, 11, 13, 24, and 8 in **Table 2.4.2-1**), landscaping is proposed as part of the project to soften views of the site from local roadways.

Similarly, the planned transportation improvements, including the Build Alternative, would result in changes to the existing visual environment as a result of roadway widening, new sign structures, retaining walls, and vegetation removal. As summarized in **Section 2.1.8, Visual Aesthetics**, adherence to Caltrans standard design requirements would ensure that the future transportation projects do not result in adverse effects to visual character or quality. Given the above, the planned land use developments and future transportation projects, including the Build Alternative, would not result in cumulative effects to visual character or quality.

None of the transportation improvement projects, including the Build Alternative, would substantially affect scenic vistas or resources. Portions of the future transportation improvements would occur within the I-680 state designated scenic corridor; however, these are not expected to have adverse effects on the scenic resources in this portion of the corridor. For the planned land use projects in Milpitas and Fremont, implementation of several general plan policies would be expected to reduce potential development-related effects on scenic vistas. For the Milpitas projects, these include Policies 4.g-I-1 through 4.g-I-6, which limit the types of development within close proximity of designated scenic corridors and require detailed design review as part of the project approval process. For the Fremont project, these include Policies 2-1.3, 4-1.7, and 4-1.8; which would protect Fremont's open space "frame"). Effective implementation of these policies would ensure that the future land use projects listed in **Table 2.4.2-1** would not adversely affect scenic vistas or resources. Given this, and based on the available environmental documents for the projects listed in **Table 2.4.2-1**, the planned land use developments and future transportation projects, including the Build Alternative, would not result in cumulative effects to scenic vistas or resources.

Cultural Resources and Paleontology

The cumulative setting for cultural and paleontological resources includes the areas within and surrounding the project limits which have documented cultural and paleontological resource sites, and/or high sensitivities to unrecorded artifacts (Caltrans, 2014d). Cumulative effects to cultural and paleontological resources would occur if planned and foreseeable development results in the removal of a substantial number of historic structures or archeological/paleontological sites that, when taken in combination with the project, and could degrade the physical historical record of the larger project region. Since all planned and foreseeable projects, including the Build Alternative, would involve ground disturbing construction activities, all projects have the potential to adversely affect known and unknown resources. However, cultural and paleontological resources - both known and unknown - are protected by a number of federal, state, and local regulations, reinforced by goals, and policies associated with each city's general plan as well as the planning documents of the transportation agencies that would be approving the planned and foreseeable improvements.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the NAHC who will then notify the MLD. At this time, the person who discovered the remains will contact Caltrans Professionally Qualified Staff (PQS) Archaeologist 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.

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. Additional study or survey will be needed if the project design changes or project limits are extended beyond the present survey limits.

Unintentional adverse effects on archaeological resources will be avoided by establishing Environmentally Sensitive Areas and Archaeological Monitoring Area (ESAs and AMAs) around the archaeological site boundaries within the Build Alternative's Area of Potential Effect (APE), and the high-sensitivity locations within the project limits. The ESA will be designated by temporary orange-mesh fencing erected to bar entry into the site. A summary of the ESA and AMA Action Plan tasks are outlined in **Section 2.1.9, Cultural Resources**.

All of the future transportation improvements would also be required to adhere to Caltrans standard approach to project-related paleontological resource efforts, which involves the identification, evaluation, and, as necessary, mitigation. These three steps generally entail preparation of five separate documents that are:

- Paleontological Identification Report (PIR)
- Paleontological Evaluation Report (PER)
- Paleontological Mitigation Plan (PMP)
- Paleontological Mitigation Report (PMR)
- Paleontological Stewardship Summary (PSS)

Implementation of the regulations and standard Caltrans resource identification efforts, as prescribed under the Build Alternative, would ensure no cumulative effect to cultural or paleontological resources. As such, the planned development in combination with the Build Alternative would not result in a cumulative effect to cultural or paleontological resources. .

Hydrology and Floodplain/Water Quality and Stormwater Runoff

The cumulative setting for hydrology, floodplains, water quality, and stormwater runoff includes those streams, floodplains and watersheds within which the Build Alternative improvements would be located, as well as the receiving waterways, marshes, and wetlands that intersect and/or are adjacent to I-680 within the project limits. The proposed development in the region (i.e., projects listed in **Table 2.4.2-1** and planned transportation projects), including the Build Alternative, will contribute to an increase in impervious surface in the watershed area that could increase the quantity and velocity of stormwater runoff and reduce groundwater recharge. For those developments located on higher elevations/hillside (ID Nos. 8, 9, 10, 11, 13, 24, and 25) groundwater recharge is not an issue given the depth to groundwater can range up to 27 feet deep. Certain land use development projects planned for in low-density urban areas would convert natural ground cover to impervious structures and/or paved surfaces (see ID Nos. 13 and 14). Similarly, increased paved surfaces would result from the future roadway widening projects, including the Build Alternative. Any additional impervious areas would decrease the amount of rainfall expected to infiltrate into the ground and would result in higher peak flows in area drainages. Increased peak flows could exacerbate flooding problems along the drainage lines that experience flooding under existing conditions. All future and planned projects in the region would be required to comply with the requirements of the State Water Resource Control Board (SWRCB) C.3 regulations and coordinate with City and County construction and flooding regulations. The SWRCB regulations require the incorporation of post-construction stormwater controls, which include measures to reduce stormwater pollutants, or otherwise minimize the change in rate and flow of stormwater runoff. Additionally, construction activities and operation of the planned freeway improvements would be regulated under the applicable Caltrans' National Pollutant Discharge Elimination System (NPDES) permits and Storm Water Management Plan (SWMP), which regulate storm water discharge from activities on roadways. Each project would convey its stormwater runoff via different drainage systems, which would be required to have adequate capacity for any increased runoff. The Build Alternative would not violate any water quality standards, deplete groundwater supplies, alter drainage patterns, or create capacity exceeding runoff through the implementation of standard long-term pollution prevention and control measures be incorporated into the final design (see **Measures WQ-1** through **3**). Based on a review of the available environmental documents for the foreseeable projects, with implementation of state and local regulations, such projects would not result in an adverse effect to hydrology and water quality. Thus, anticipated development in combination with the Build Alternative would not result in a cumulative effect to hydrology, floodplains, and water quality.

Air Quality

The cumulative setting for air quality includes the San Francisco Bay Area Air Basin (SF Air Basin) and the jurisdictional boundaries of the Bay Area Air Quality Management District (BAAQMD). Construction of other transportation improvements as well as of anticipated land use development projects would entail construction-period emissions of air pollutants and greenhouse gases.

The operation of the planned land use development projects listed in **Table 2.4.2-1** would generate additional traffic emissions. In addition, improved freeway operations would result in an increase in vehicle miles traveled (VMT) and related increases in vehicle emissions. Therefore, air quality impacts associated with transportation and other development projects in the SF Air Basin would result in cumulative effects to air quality for permanent operational pollutant emissions. The projects listed in **Table 2.4.2-1** are required to comply with the Bay Area 2010 Clean Air Plan. The Bay Area 2010 Clean Air Plan (CAP) takes into account future growth projections to 2035 and serves to:

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement "all feasible measures" to reduce ozone
- Provide a control strategy to reduce ozone, particulate matter, air toxics, and greenhouse gases in a single, integrated plan

- Review progress in improving air quality in recent years
- Establish emission control measures to be adopted or implemented in the 2010-2012 timeframe.

The Cities of Fremont and Milpitas must ensure that the projects are in compliance with the CAP and that the project implements control measures to improve air quality and protect public health.

Transportation plans that have been found to conform with the State Implementation Plan (SIP) are not considered to cause or contribute to violations of ambient air quality standards. Furthermore, a project included in a conforming plan would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Conforming transportation plans are subject to a threshold of no net increase in emissions. Because the project is included in Plan Bay Area and 2013 Transportation Improvement Program (TIP), which conform to the SIP, the Build Alternative would not result in a cumulatively considerable net increase of any criteria pollutant.

Noise

The cumulative setting for noise is equivalent to the noise study area evaluated in **Section 2.2.7**, **Noise**, and encompasses all developed land uses surrounding the proposed Build Alternative improvements, with a focus on noise-sensitive receivers. Noise-sensitive land uses in the vicinity of the project limits include single- and multi-family residences, active recreational areas, day care centers, churches and hotels. The noise study conducted for the project utilized traffic volumes based on the Alameda CTC Travel Demand Forecasting Model (as modified to ensure that the model accurately reflected planned and funded land-use development and transportation projects expected to be in place by 2040). As such, the noise study conducted for the project analyzed cumulative conditions within the study area, including the planned transportation projects previously listed and the developments identified in **Table 2.4.2-1**.

Planned development considered in the cumulative noise analysis include those residential projects that have received final development approval and are within approximately 500 feet of the centerline of I-680, where traffic noise levels from the highway could dominate the noise environment. Future developments located beyond this distance are excluded from further analysis. Most of the land uses within the noise study area are developed; however, there are a few residential projects in the cities of Milpitas and Fremont, which would be developed in the future. No future development of noise-sensitive projects is proposed within the portion of the noise study area that is within Alameda County.

Sensitive receptors in close proximity to the project limits include several existing and planned residential and hotel uses. Under the cumulative 2040 conditions, noise increases in the areas of the existing noise sensitive land uses would generally range from 0 to 1dB, which is not considered a substantial increase in noise. However, noise levels within the sensitive receptors areas would exceed the NAC thresholds under the cumulative conditions. Noise levels above the NAC thresholds represent a cumulative effect. There are two future residential developments in the City of Milpitas that are proposed in the vicinity of segment 1 of the noise study area: the Sinclair Renaissance Residential Project (80 single family residential units, located approximately 235 feet from the center of I-680), and the residential development at 905-980 Los Coches Street (83 dwelling units, located approximately 163 feet from an I-680 on ramp). Both development projects propose noise barriers as part of the design to maintain exterior noise levels below the applicable NAC thresholds. There are three future residential developments in the City of Fremont that are proposed in the vicinity of the noise study area: the Sabercat Neighborhood Center Project (158 multi-family residential units, located approximately 160 feet from the center of northbound I-680, segment 4 of the noise study area); the Mission Creek Residential Project (single-family residences northwest of I-680, between Palm Avenue and Mission Boulevard, segment 7 of the noise study area); and the 42425 Mission Boulevard Residential Project (residential development 435 feet from the center of I-680, segment 8 of the noise study area). **Figures 2.1-2a** and **2.1-2b** in **Section 2.1.1, Land Use,** illustrate the locations of each of the aforementioned developments. These approved developments would not experience noise levels above the NAC thresholds at any point of a day, including heavy traffic periods.

With the exception of one location, noise increases generated by the Build Alternative traffic generally range from 0 to 1 dBA, which is not considered a substantial increase in noise, nor would it contribute substantially to a cumulative noise effect. However, because the noise levels within the various segments of the noise study area already exceed the NAC threshold, noise abatement options were considered, and the preliminary noise abatement analysis and decision is presented in **Section 2.2.7, Noise**.

A substantial noise level increase of 15 dBA would occur as a result of the project at one location within Fremont (segment 7 of the noise study area), where portions of an existing 8 to 14-foot high barrier would be removed under the Build Alternative. In this location, the project would have a considerable contribution to a cumulative effect. To address this noise increase, Caltrans intends to incorporate noise abatement in the form of a replacement noise barrier (NB Wall 13), located along northbound I-680, between Palm Avenue and Mission Boulevard (see **Mitigation Measure NOI-A**), as shown in **Appendix H**. Barrier NB Wall 13 would replace portions of the existing soundwall that would be removed under the Build Alternative with an equivalent height of 14 feet. Calculations based on preliminary design data indicate that the barrier will reduce noise levels by 14 to 15 dBA for ten residences at a cost of $1,675,680.

The implementation of the noise abatement options determined to be feasible would effectively reduce noise levels below the NAC thresholds to a level that would completely offset the Build Alternative's contribution to cumulative noise levels. The chosen abatement type would be the construction of noise barriers. If, during final design, conditions substantially change, noise barriers might not be provided. The views and opinions of the residents living immediately adjacent to the I-680 corridor and affected by the traffic noise would be considered in reaching a decision on noise abatement measures. Caltrans' policy is to not provide noise barriers if 50 percent or more of those affected residents do not want them. The opinions of these residents would be obtained through public and community meetings or other means, as appropriate. The final decision regarding noise abatement would be made upon completion of the project design and public involvement processes.

As discussed in **Section 2.2.7, Noise**, there are 11 locations where the cost of the noise abatement options (i.e., construction of a soundwall) would exceed the reasonable allowance for the sensitive receivers that would benefit from the noise reduction. In these locations, the noise abatement and decision analysis does not recommend the implementation of feasible (but not reasonable) noise abatement options. It is also possible that design restrictions (i.e., steep slopes) or negative public response to the construction of soundwalls along the freeway would prevent the implementation of the noise abatement options that are considered both feasible and reasonable. If recommended noise abatement is not implemented as part of the Build Alternative, cumulative noise levels (2040) would generally increase between 0 and 1 dBA within the study area. In accordance with the Caltrans' Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, an increase in noise levels of this magnitude is not considered a substantial increase (defined as 12 dBA). However, construction of the Build Alternative without the inclusion of NB Wall 13 would result in a noise increase of 15 dBA, which would represent a considerable contribution towards a cumulative noise effect to the residences along northbound I-680, between Palm Avenue and Mission Boulevard.

Biology

The area of cumulative analysis for biological resources includes the Biological Study Area (BSA) identified for the Build Alternative plus any immediately adjacent lands and waterways containing sensitive biological resources (sensitive habitats or protected plant or animal species). The planned and approved transportation improvements and land use developments listed in **Table 2.4.2-1** and the Build Alternative are not located in designated critical habitat areas where threatened and endangered species, such as California tiger salamanders, California red-legged frogs, and Alameda whipsnakes are expected to occur. Given this, there would be no cumulative effect to critical habitat.

Future transportation improvements and land use developments have an unknown and unquantifiable effect on special-status species and potential biologically sensitive habitats. Although not quantifiable, it is assumed that the implementation of the planned and foreseeable improvements may result in the degradation of wildlife habitat through a variety of actions which, when combined with the Build Alternative, may result in a cumulative impact to biological resources as described below.

With the exception of a handful of projects planned in Fremont, the future land use development along the project limits includes in-fill residential/commercial improvements where local waterways and other riparian features do not exist. The built-up urban environments do not provide the necessary habitat or connectivity to known habitat that special-status species, including threatened and endangered species in this region need. However, there are several local waterway crossings and riparian features (i.e., creeks, drainage ditches and small ponds) along the project limits and surrounding areas that represent potential habitat for California Tiger Salamanders, western pond turtles, central California coast DPS steelhead, and California red-legged frogs (see development ID Nos. 13, 16, 17, 18, 21, and 23 in **Figure 2.1-2b**). Additionally, the low-density urban areas and foothills near the planned developments Nos. 9, 13 and 14 (see **Figure 2.1-2b**) may provide enough space and natural vegetation to support wildlife like the Alameda whipsnake, western burrowing owls, American badger, San Francisco dusky-footed woodrat, and San Joaquin kit fox. Furthermore, increased development and disturbance created by human activities (i.e., fires, increased nighttime lighting, etc.) would result in the direct mortality, habitat loss, and deterioration of habitat suitability. Based on the environmental document available for Project No 9, Bringhurst Property, that project would result in the direct affect to 500 feet of riparian habitat and has a potential affect to roosting bats.

The effects of these projects would be assessed as part of their separate agency consultation and permitting processes. Compliance with the regulations and adherence to the required permitting processes would ensure that there are no unmitigated effects resulting from projects in the region. In addition, the San Francisco Public Utilities Commission is currently preparing a Section 10 consultation effort, known as a Habitat Conservation Plan (HCP), for continued operations and maintenance of the Alameda Creek watershed. The HCP will contain substantial mitigation and protective measures for sensitive species in the Alameda Creek watershed.

The physical footprint of the proposed Build Alternative improvements would require a moderate amount of tree removal. Similarly, the physical footprint for the planned land use developments listed in **Table 2.4.2-1** and future transportation improvements would also require varying degrees of tree removal that would be reviewed and/or permitting during the individual project approval processes. The future transportation projects could also require bridge widening at bridges along I-680, I-580, and State Route 84. Tree removal for the planned and programed projects, in combination with the tree removal implemented under the Build Alternative, would reduce the amount of potential nesting habitat for a number of bird species protected under the Migratory Bird Species Act. Additionally, bridge widening or tree removal could result in direct impacts to special-status bat species. Therefore, the planned and programmed projects in the area, in combination with the Build Alternative, could result in cumulative effects to trees and related nesting species, as well as special-status bat species.

Water quality during construction and project operation would be protected by best management practices (BMPs) that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures WQ-1, WQ-2, and WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA were maintained for the special-status species, including central California coast DPS steelhead that could be present in this aquatic habitat.

In addition to the measures that would protect the water quality of aquatic habitats, the Build Alternative includes a number of avoidance and minimization measures that are considered part of the project design and apply to all of the proposed improvements under the Build Alternative(see **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**). In summary, these measures include provisions that would require:

- assignment of qualified biological monitor(s) during construction
- implementing worker environmental awareness training
- preventing inadvertent entrapment of special-status species during construction
- implementing seasonal restrictions and work windows for certain construction activities
- conducting pre-construction species surveys
- minimization of bat and bird disturbance during bridge widening and tree removal
- proper vehicle use near sensitive natural communities
- limiting nighttime construction and artificial nighttime lighting
- maintaining good housekeeping practices regarding food-related trash items and pets; and restrict firearms
- implementing local tree preservation policies for tree removal outside of state right-of-way
- adherence to the conservation measures and terms of the biological opinion
- complying with the Executive Order on Invasive Species (EO 13112)

These avoidance measures would be implemented prior to and during construction activities, and would be included as part of the special provisions of the construction bid package for the project. Implementation of the avoidance and minimization measures included in the project design would avoid adverse effects to the majority of the wildlife species within the BSA. Adverse effects that would not be avoided and/or reduced through the implementation of the avoidance measures include the direct displacement of oak woodlands; jurisdictional water features; and habitats suitable for the protected California tiger salamander, California red-legged frog, Alameda whipsnake, and central California coast DPS steelhead. Therefore, compensatory mitigation measures have been proposed. See **Impacts BIO-A** through **BIO-F** in **Section 3.2.3, Significant Environmental Effects of the Proposed Project**. Implementation of **Mitigation Measures BIO-A** through **BIO-F**, in combination with the avoidance measures, would offset adverse impacts to the direct displacement of oak woodlands, jurisdictional water features, and special-status species. Thus, the Build Alternative would not have a considerable contribution to cumulative biological effects.

3.0 CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION

3.1 DETERMINING SIGNIFICANCE UNDER CEQA

The proposed project is a joint project by the California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other action required in accordance with NEPA and other applicable federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 United States Code (USC) 327. 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 some 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 the 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 EFFECTS OF THE PROPOSED PROJECT

The CEQA Environmental Significance Checklist (**Appendix A**) identifies the physical, environmental effects that might be affected by implementation of the proposed Build Alternative. The findings for the CEQA checklist were determined in consultation with the technical studies prepared for this project, as listed in **Chapter 7.0, References.** The CEQA impact levels include: potentially significant impact, less-than-significant impact with mitigation, less-than-significant impact, and no impact. In many cases, background studies performed in connection with the Build Alternative indicate no significant impact.

3.2.1 NO EFFECTS

As part of the scoping and environmental analysis conducted for the Build Alternative, land use, recreation, forestry resources, mineral resources, and energy conservation were considered but found to have no adverse impact. Refer to **Table 2-1** for a more detailed description of these resource areas. **Section 2.2.3, Geology/Soils/Seismic/Topography**, includes a detailed discussion of nearby mineral resources deposits for informational purposes.

3.2.2 LESS-THAN-SIGNIFICANT EFFECTS OF THE PROPOSED PROJECT

The CEQA Checklist identified the following items as "Less than Significant". These items include resource areas where the Build Alternative would have a less-than-significant effect with the implementation of the avoidance and minimization measures identified in the relevant sections of **Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures**.

AESTHETICS

Caltrans designated I-680 as an Official State Scenic Highway between Mission Boulevard (SR 238) in Fremont and the junction with SR 24 in Walnut Creek. Approximately one-third of the project limits (within the Phase 1 segment) are within the scenic corridor. The scenic aspects of the corridor include the rolling wooded hills of the Contra Costa range contrasted with the flat Sunol Valley ringed by distance hills to the north and east. Additionally, I-680 from the Santa Clara County line to Mission Boulevard (SR 238) is eligible for designation as a state scenic highway, but not officially designated.

The immediate vicinity of visual resource study area consists of urban development through Milpitas and Fremont and open hilly terrain in the unincorporated Alameda County area. Urban development consists of low-density residential neighborhoods from flatlands to the foothills and scattered areas of low-density commercial development. The unincorporated Alameda County portion of the visual resources study area is mostly open space with rolling hillsides and scenic views.

Implementation of the Build Alternative would result in changes to the existing visual environment. Proposed overhead express lane signs, retaining walls, and vegetation removal would occur throughout the study area. The changes would be more evident in Visual Assessment Unit C (from Mission Boulevard (SR 238) to the northern-most project limits), which is within the I-680 officially designated state scenic highway. The new sign structures, retaining walls, and vegetation removal would periodically disrupt motorists' views of the undeveloped hillsides. These project components, however, would be constructed in accordance with Caltrans design standards, and would not be any larger than what is required for structural and/or safety purposes. Offsets to the visual impacts within the scenic corridor could also be included in the final landscape design, such as tree plantings or development of scenic overlooks. These types off landscape details would be defined during the final design phase of the project, potentially under separate contract. Although new structure and vegetation removal would occur within the project study limits, the Build Alternative would not substantially change the existing visual character or quality within the study limits. Thus the impact of the Build Alternative on aesthetics would be less than significant.

While the Build Alternatives' impact on aesthetics is considered less-than-significant, Caltrans has developed additional avoidance, minimization, and/or mitigation measures to further reduce visual effects. Overhead sign structures and retaining walls would be designed in such a way that reduces visual impacts to the area through a variety of aesthetic applications described in **Measures VIS-1** through **VIS-6**. Implementation of the design requirements proposed as part of the project and summarized in **Section 2.1.8, Visual/Aesthetics**, would further reduce impacts to visual resources within the project area.

Design elements of the Build Alternative with the potential to add new sources of light and glare would be designed to minimize potential adverse effects to adjacent land uses. The sign elements of the Build Alternative would be designed per *Caltrans California Manual on Uniform Traffic Control Devices*. None of the proposed signage would reflect light onto adjacent land uses. The majority of the safety lighting installed under the Build Alternative would be between the I-680 freeway and interchange on-and off-ramps, within the freeway median, and more than 250 feet from any adjacent development. Lighting infrastructure that would be along the northbound I-680 travel lanes, directly adjacent to the single-family homes, are in locations where the homes are situated behind a soundwall. The additional lighting proposed as part of the Build Alternative would be designed with downward cast lighting, per Caltrans requirements, which prevents the illumination of areas outside of the freeway right of way. Due to the relative distance of the adjacent development, the location of the soundwalls, and design requirements, the proposed lighting would not directly affect the adjacent properties. Furthermore, because lighting infrastructure (local street lighting) already exists within the adjacent commercial, industrial, and residential areas, the additional lighting infrastructure along the freeway would not introduce substantial new sources of light for the developed surrounding areas.

Nighttime construction activities may temporarily add new sources of light and glare for residents, businesses, and local motorists along the I-680 corridor. As construction equipment and machinery would potentially be stationed at any of the identified staging areas within the project limits, temporary sources of light and glare would be added to the Visual Assessment Units during the construction phase. However, temporary visual impacts from the construction of the Build Alternative would be typical of any major corridor improvement project, and are not considered to be significant.

AGRICULTURE

A project that converts agricultural land to non-agricultural land or impairs the agricultural productivity of the farmland could result in a significant impact to agricultural resources. As recommended in Appendix G of the CEQA Guidelines, a Land Evaluation and Site Assessment (LESA) worksheet was completed for the project for comparative purposes only to assess potential impacts associated with farmland conversion. The LESA is included as **Appendix K**. In addition, cancelation of Williamson Act contracts for parcels exceeding 100 acres would be subject to CEQA review under Section 15206 (b)(3). Government Code Section 51293(d) exempts acquisition of Williamson Act property for public utility improvements from the prohibition of public improvements if the land surface is returned to its previous condition and when agricultural use of the affected parcel is not “significantly impaired” by construction of the public utility.

The Build Alternative would convert a total of 1.21 acres of Unique Farmland, consisting of 0.57-acres of property acquisition and 0.64-acres for a utility easement (**Table 3.2.2-1**). The Land Evaluation component of the LESA totaled 50 points and the Site Assessment totaled 16.44, which results in an overall LESA score of 66.44. According to the LESA model scoring thresholds presented in **Table 3.2.2-2**, the proposed conversion of agricultural resources under the Build Alternative is considered less-than-significant.

The Build Alternative would require right-of-way acquisition and a gas line utility easement resulting in conversion of approximately 0.07 acres of land under a Williamson Act contract (**Table 3.2.2-1**). This portion of the property is designated as Non-Prime Agricultural Land on the Williamson Act map and is not designated as Farmland under the Farmland Mapping and Monitoring Program (FMMP).

Under CEQA, cancelation of Williamson Act contracts for parcels exceeding 100 acres are subject to CEQA review. The Build Alternative would require acquisition of 0.07 acres of property under a Williamson Act contract, and therefore does not trigger Section 15206 (b)(3) of the CEQA Guidelines. As part of the project, Caltrans will comply with Government Code Section 51293(d), ensuring that the land surface disturbed for the relocation of utilities will be restored to its original conditions. Compliance with Government Code Section 51293(d) would ensure that the proposed conversion of property under Williamson Act contract would not result in a significant impact. The remaining portion of the agricultural property would not be impaired by the utility easement, and would remain under Williamson Act contract.

Table 3.2.2-1 Farmland Property Acquisition

Assessor Parcel Number (APN)	Property Owner	Partial Row Acquisition		Utility Easement	
		Square feet	Acre	Square feet	Acre
096-0375-011-05	City & County SF Water Dept.	24,780	0.57	0.00	0.00
096-0375-011-05	City & County SF Water Dept.	0.00	0.00	27,825	0.64
	Total	24,780	0.57	27,825	0.64

Source: WMH, 2013

Table 3.2.2-2 California LESA Model Scoring Thresholds

Total LESA Score	Scoring Decisions
0 to 39 Points	Not Considered Significant
40 to 59 Points	Considered Significant only if LE and SA subscores are each greater than or equal to 20 points
60 to 79 Points	Considered Significant unless either LE or SA subscore is less than 20 points
80 to 100 Points	Considered Significant

Source: California Department of Conservation, Division of Land Resource Protection, http://www.consrv.ca.gov/DLRP/qh_lesa.htm. Last accessed May 29, 2014.
Note: LE – Land Evaluation; SA – Site Evaluation

AIR QUALITY

The Build Alternative would not cause a significant change to air quality in the project area, conflict with the implementation of an applicable air quality plan, violate any air quality standards, or contribute to any air quality violation. In addition, the Build Alternative would not expose sensitive receptors to substantial pollutant concentrations or create objectionable odors. The construction of the Build Alternative would cause a significant number of motorists to use the HOV/express lane within the project limits. This increase is to be expected given the nature of the project and the overall level of traffic growth anticipated over this time period. While the increased throughput of motorists within the project limits may slightly increase vehicle emissions in the area, the project conforms to the State Implementation Plan (through its inclusion in the applicable regional transportation plans) which qualifies the project as one that would not result in a considerable net increase of any criteria pollutant. See **Section 2.2.6, Air Quality**, for a more detailed analysis. Given the above, the Build Alternative's impact on air quality would be less-than-significant.

BIOLOGICAL RESOURCES

Section 2.3, Biological Resources, evaluates the project's effect on biological resources mapped within the biological study area (BSA) for the Build Alternative. The BSA for the project includes the physical footprint of the Build Alternative, including all areas where ground disturbance would occur from the construction of the proposed improvements (e.g., construction staging areas, demolition, earthmoving activities, etc.), areas of right-of-way to be obtained for the project, and temporary access areas. The BSA was defined to also include the areas of indirect effects that may occur outside of the indirect physical footprint of the Build Alternative. **Appendix I** illustrates the limits of the BSA for the Build Alternative.

As described in **Section 2.3, Biological Resources** , earth moving construction activities and stage of construction materials may result in potential impacts to special status-species, specifically to suitable habitat for the western burrowing owl, western pond turtle, American badger, and San Francisco dusky-footed woodrat.

Burrowing owls may be indirectly affected by noise, light, and visual disturbance. Indirect impacts to western pond turtle may result from habitat exclusion (i.e., physically preventing the animal from entering suitable habitat) and water quality degradation from erosion, sediment loading or construction activities. If woodrat nests are located in the zone of temporary impact for the Build Alternative, construction noise and activity could disturb the woodrats enough to cause nest abandonment. Tree removal for the Build Alternative would reduce nesting habitat for a number of bird species protected under the Migratory Bird Species Act. Temporary displacement due to habitat alterations or disturbances from construction equipment noise could also occur as a result of the project. Direct mortality of bats may occur if day roosts are removed during bridge widening or tree removal. Bats may be directly harmed by construction equipment, or forced into the open where they will become vulnerable to predation and mortality from exposure if they cannot find an alternative roost site. Night roosts at several bridges may be indirectly impacted by noise, nighttime lighting, vibration from construction activities, and disturbance from humans and equipment moving under the bridge. These night roosts may become temporarily unavailable for use by bats during project construction.

Water quality during construction and project operation would be protected by standard best management practices (BMPs) that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality**; **Measures WQ-1, WQ-2,** and **WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that could be present in these aquatic habitats. Additionally, standard efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures,** that are proposed as part of the project would minimize the potential impacts to these special-status species during project construction. These measures include biological monitoring (**Measure BIO-2**), worker environmental awareness training (**Measure BIO-3**), prevention of wildlife entrapment (**Measure BIO-4**), and wildlife exclusion fencing (**Measure BIO-5**), pre-construction surveys (**Measure BIO-8**), and the prohibition of monofilament plastic (**Measure BIO-27**), among others.

Based on the analysis provided in the Natural Environment Study (NES) prepared for the project, the project would have no measureable impact (less than significant impact) to the San Joaquin Kit Fox.

The lack of reported observations of San Joaquin kit fox in the area and, the general consensus that the BSA is at the periphery of the range of the species supports a conclusion that if the species does occur, it does so sporadically and in low numbers. Since the proposed improvements would occur on the margins of the known current range of San Joaquin kit fox, and because Caltrans standard measures will be implemented to protect any transient, individuals entering the BSA from being directly, physically harmed or injured by construction activities or equipment, the Build Alternative is would result in less-than-significant impact to the essential behavioral patterns of this species, including breeding, foraging, or migration. No direct impact to suitable habitat for the San Joaquin kit fox through the destruction of foraging or denning habitats is anticipated.

Please refer to **Section 3.2.3, Significant Environmental Effects of the Proposed Project** for a detailed description of potentially significant and significant impact to other biological resources within the BSA.

CULTURAL RESOURCES

Based on the investigations conducted, there is one archaeological site and four historic-era built resources within the Build Alternative's project study area. The four built resources were determined ineligible for the National and California Registers and were not determined to be historic by any local authorities. Therefore they were not considered historical resources under CEQA. As such, no protective measures were required to protect them.

Construction of the Build Alternative would adhere to Caltrans standard construction measures. In adherence to the standard measures, an Environmentally Sensitive Area and Archaeological Monitoring Area Action Plan (ESA and AMA Action Plan) are established to protect known cultural resources within the APE. The ESA and AMA Action Plan include enforcement measures and standard conditions that are considered part of the project. The plan was filed with the California State Historic Preservation Officer (SHPO) for concurrence. On January 13, 2014, SHPO issued a letter of concurrence for the *Finding of No Adverse Effect with Standard Conditions/ESA and AMA Action Plan* and the NRHP eligibility determinations for the architectural resources. The Historic Property Survey Report, prepared for this project, determined no substantial adverse change (i.e., less-than-significant impact) to these resources with these standard conditions of the project design.

Additional provisions under Caltrans policy and the state regulations would address the potential for construction activities to unearth previously unidentified resources (including human remains). Furthermore, avoidance measures in **Section 2.1.9, Cultural Resources** would further reduce impacts to unknown cultural resources. Adherence to the requirements in the ESA and AMA Action Plan, Caltrans policy, and state regulations would avoid and minimize potential cultural resource impacts. Thus the impact of the Build Alternative on cultural resources would be less-than-significant.

The Build Alternative could have a potentially significant impact on paleontological resources if uncovered during construction as described under **Impact PAL-1** in **Section 3.2.3, Significant Environmental Effects of the Proposed Project**. Implementation of **Mitigation Measure PAL-A** would reduce this impact to a less-than-significant level (see **Section 2.2.4, Paleontology**, and **Section 3.6, Mitigation Measures for Significant Impacts Under CEQA**).

GEOLOGY AND SOILS

The Build Alternative would not result in a significant impact to the geology of the site. All structures constructed as part of the Build Alternative would comply with the Caltrans' design standards specific to the seismic risks and soil conditions within the project limits. People and structures would not be exposed to substantial adverse effects involving fault rupture or other seismic-related issues. The proposed improvements would not result in the substantial soil erosion or the loss of topsoil. Thus, the impacts of the Build Alternative on geology and soils would be less-than-significant. See **Section 2.2.3, Geology/Soils/Seismic/Topography**, for a more detailed analysis.

HAZARDS AND HAZARDOUS MATERIALS

The Build Alternative would not create any significant hazards to the public or environment. Preliminary Site Investigation would be performed to investigate hazardous materials concerns related to soil, groundwater, and construction materials within the project limits, as identified in the Initial Site Assessment prepared for the project (Caltrans, 2014e). A work plan for the Preliminary Site Investigation would be submitted to Caltrans for review and approval. Additional investigation may be required to fully evaluate potential hazardous materials issues if concerns are identified during the Preliminary Site Investigation. All environmental investigations for the project would be provided to project contractors, so the findings may be incorporated into their Health and Safety and Hazard Communication Programs. Measures would be taken to avoid exposure to hazardous materials and aerially deposited lead. No hazardous materials would be emitted as a result of the project, and no people or structures would be exposed to a significant risk of loss. Additionally, the proposed improvements would not impair implementation or interfere with any emergency plans. Thus the impacts of the Build Alternative on hazardous waste and materials would be less-than-significant. See **Section 2.2.5, Hazardous Waste/Materials**, for a more detailed analysis.

HYDROLOGY AND WATER QUALITY

As the proposed improvements would generally maintain the existing roadway profile of I-680, the Build Alternative's effects to the hydrology and floodplains would be minimal with regards to the volume of storm water runoff and changes in the 100-year water surface elevations. The Build Alternative would not place any housing with a 100-year floodplain or encourage floodplain development in the surrounding areas. Proposed structures (i.e., retaining walls, soundwalls, sign posts, etc.) would not impede or redirect flood flows.[1] Additionally, the proposed improvements would not expose people or structures to a significant risk, and there is no potential for inundation.

The Build Alternative would not result in significant impacts to water quality. Construction activities and operation of the roadway improvements would be regulated under the applicable Caltrans' National Pollutant Discharge Elimination System (NPDES) permits and Storm Water Management Plan (SWMP), which regulate storm water discharge from activities on roadways. The potential for adverse effects to water quality will be avoided by implementing temporary and permanent Best Management Practices (BMPs) outlined in the Caltrans' Standard Specifications. Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The project would not violate any water quality standards, deplete groundwater supplies, alter drainage patterns, or create capacity exceeding runoff. Thus the impacts of the Build Alternative on hydrology and water quality would be less-than-significant. See **Section 2.2.1, Hydrology and Floodplain**, and **Section 2.2.2, Water Quality and Storm Water Runoff**, for a more detailed analysis.

NOISE

Construction activities anticipated under the Build Alternative would include earthwork demolition, the installation of utilities, construction of noise barriers that are found to be feasible and reasonable, paving, and the installation of overhead signs and electrical/communication facilities. These activities are temporary in nature and would cease upon completion of construction. People would not be exposed to significant groundborne vibration. In addition, the project limits are not within an airport land use plan or within the vicinity of a private airstrip. Therefore, the construction-period impacts of the Build Alternative on noise would be less-than-significant. Temporary noise level increases would be further reduced through the implementation of **Measure NOI-1**, which includes restricted construction times, equipment mufflers, and staging of construction away from sensitive receptors. Implementation of the Build Alternative would result in a significant impact to ambient noise levels. See **Impact NOI-A** in **Section 3.2.3, Significant Environmental Effects of the Proposed Project**, for a detailed discussion. Implementation of **Mitigation Measure NOI-A** would reduce the anticipated operational noise increases to a less-than-significant level.

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[1] There are no soundwalls proposed within a 100-year floodplain.

POPULATION AND HOUSING/GROWTH INDUCING

By the year 2040, the construction of the new HOV/express lane under the Build Alternative would accommodate a 12 percent increase in the number of vehicles that can be served by northbound I-680, within the project limits, during the peak evening commute hours (2:00 to 8:00 PM). The purpose of the Build Alternative is to relieve traffic congestion and improve traffic flow on the regional highway network and create a new source of revenue for transportation related projects.

By improving access and highway capacity, the Build Alternative could indirectly result in the development and intensification of land uses in cities surrounding the project limits. There are several locations within the study area where housing and employment-generating land uses could be developed; however, these areas are already planned for and forecasted in land use regulating documents (i.e., City of Milpitas General Plan, City of Fremont General Plan, and City of Pleasanton General Plan). The surrounding areas are largely built out, and the majority of future development will generally involve redevelopment of existing areas or infill development of vacant lots within urbanized areas (see **Section 2.1.1, Land Use, Planned Development**).

The Build Alternative does not propose any changes to the zoning or land use designations along the freeway. While the Build Alternative would improve the flow of traffic access to and from I-680, no new on- or off-ramps to the local roadways would be constructed. Existing access points to the areas surrounding the project limits would remain the same. For these reasons, the Build Alternative would not affect the rate, amount, or type of growth envisioned by the regulating documents and future planned developments in the area. The Build Alternative is therefore not considered growth inducing.

Based on preliminary design, implementation of the Build Alternative would require acquisition of portions (or slivers) of 13 parcels within the project limits (see **Section 2.1.5, Community Impacts**). The land required for the Build Alternative primarily consists of slivers of property frontage and landscaped areas around on- and off- ramps. Permanent property acquisitions include portions of large rural agricultural properties, rural residential home sites, vacant residential, government owned vacant property, and commercial property. Temporary construction easements would be acquired for the duration of construction and would be returned to the property owner upon completion of construction. As a result no long-term impact to the properties would occur from temporary construction easements.

None of the property acquisitions, construction easements, or utility easements that would be needed for the Build Alternative are in areas where there are existing structures or improvements. Therefore, the Build Alternative would not significantly impair continued use of the remaining portions of these parcels. As such, no displacement of any residence or business would be required. Residents and businesses whose access may be affected will be notified in advance of construction activity. Thus the population and growth impacts of the Build Alternative would be less-than-significant.

PUBLIC SERVICES

As previously discussed, reasonably foreseeable indirect growth resulting from the Build Alternative is already planned for and forecasted in land use regulating documents (i.e., City of Milpitas General Plan, City of Fremont General Plan, and City of Pleasanton General Plan). Because the Build Alternative would not encourage growth beyond what is already planned for and forecasted, the propose improvements would not result in increased demands for public services. Therefore, the impacts of the Build Alternative on public services would be less-than-significant.

However, potential short-term operational effects to police, fire, and emergency service providers may result from construction-related activities under the Build Alternative. Increased emergency response times within the project limits could be caused by traffic congestion during construction and temporary lane closures. As described in the **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, a Traffic Management Plan that specifies all timeframes for all lane closures and would be prepared. Personnel of emergency response services such as fire and police protection would also be notified 1 to2 weeks in advance of any lane or roadway closures so that alternative routes could be taken. Implementation of the Traffic Management Plan would further reduce potential short-term operational impacts to police, fire, and emergency service providers that may result from construction-related activities under the Build Alternative. Furthermore, the proposed improvements under the Build Alternative would ultimately reduce traffic congestion and improve access for emergency services along the I-680 corridor.

UTILITIES AND SERVICE SYSTEMS

Because the Build Alternative would not encourage growth beyond what is already planned for and forecasted, the propose improvements would not result in increased demands for public utilities (i.e., potable water and solid waste disposal needs). Therefore, the impacts of the Build Alternative on public utilities and services would be less-than-significant.

The Build Alternative would add approximately 29 acres of new impervious area, the bulk of which would be added in Phase I (approximately 22 acres) through road widening and modifications to the existing roadway and ramps. The proposed widening and modifications to the existing freeway and ramps are expected to result in the fill or removal of existing ditches, modification or relocation of existing longitudinal drainage structures, and construction of new drainage structures. The new drainage structure will be designed to capture the additional runoff that would be created by implementation of the Build Alternative. The direct, physical effects related to the installation and construction of drainage facilities are captured in **Section 2.2, Physical Environment**, of this environmental document as part of the evaluation of temporary construction activities of the Build

Alternative. The only resource topics with the potential to be significantly impacted by temporary construction activities are biological and paleontological resources, as described in **Section 3.2.3, Significant Environmental Effects of the Proposed Project,** below. Given the above, the Build Alternative's impact would be less-than-significant.

As described in **Section 2.1.6, Utilities/Emergency Services**, the final location of the electronic components of the Build Alternative would be determined during the final design phase of the project and in coordination with the tolling systems manager. To provide electrical power and communications to the electronic tolling equipment and signage for the express lane facility, electrical and communications conduits and fiber would be extended from existing sources along the outside edge of pavement. 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.

Relocation and adjustments to existing gas and electric transmission lines and street lighting are proposed as part of the Build Alternative. Utilities that would be affected include gas, and electrical lines. The relocation of utilities may result in minor interruption of service. To minimize this potential, Caltrans would enter into agreements with the utility providers, including PG&E and Alameda County. The precise field location of high-risk utilities would be identified during the final design phase in accordance with the Caltrans Procedures on High Risk Utilities. Initial coordination with utility companies has been completed. The direct, physical effects related to the installation and relocation of utilities are captured in **Section 2.2, Physical Environment**, of this environmental document as part of the evaluation of temporary construction activities of the Build Alternative. The only resource topics significantly impacted by temporary construction activities are biological and paleontological resources, as described in **Section 3.2.3, Significant Environmental Effects of the Proposed Project**.

3.2.3 SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSED PROJECT

This subsection identifies significant impacts as a result of implementation of the Build Alternative. Impacts under CEQA are avoided or minimized through implementation of standard conditions, minimization measures, and mitigation measures. Implementation of standard conditions is assumed prior to making a determination if an impact is significant. Other mitigation measures, as those identified in **Chapter 2** of this EIR/EA and **Appendix E**, Environmental Commitments Record would in all cases reduce impacts identified as significant to less than significant, as described below.

BIOLOGICAL RESOURCES

Impact BIO-A: Implementation of the Build Alternative would have a significant impact on protected jurisdictional water features

Impact BIO-B: Implementation of the Build Alternative would have a potentially significant impact on the California tiger salamander

Impact BIO-C: Implementation of the Build Alternative would have a potentially significant impact on the California red-legged frog

Impact BIO-D: Implementation of the Build Alternative could have a potentially significant impact on the Alameda whipsnake

Impact BIO-E: Implementation of the Build Alternative would have a significant impact on Oak Woodlands

Impact BIO-F: Implementation of the Build Alternative would have a potentially significant impact to the Central California Coast DPS Steelhead

Section 2.3, Biological Environment, evaluates the project's effect on biological resources mapped within the BSA for the Build Alternative.

The vegetation types identified within the BSA support a variety of wildlife species, including those designated as special-status, protected wildlife. Marsh habitats can provide habitat for fish nurseries, amphibians, aquatic reptiles, wading birds, waterfowl, and song birds. Riparian woodland can provide foraging, roosting, and nesting habitat for a variety of birds and provide cover and refuge sites for small mammals, amphibians, and reptiles. **Section 2.3.1, Natural Communities**, provides descriptions of the natural communities present within the BSA. The physical footprint of the proposed Build Alternative improvements, in addition to earth-moving construction activities and/or staging of construction materials, including tree removal, would result in a significant impact to sensitive natural communities, nesting birds, wetlands and other waters, and special-status species as described below.

Jurisdictional Water Features

Table 2.3.2-2 shows the impacts to wetland and water features within the BSA with implementation of the Build Alternative. Impacts would occur as a result of grading and paving activities, retaining wall construction, and biofiltration construction. Full build out of the Build Alternative would result in 0.26 acres of direct impacts, of which 0.14 acres would occur within the Phase 1 portion, to wetlands and other water features. Temporary and permanent impacts to jurisdictional water features are considered a potentially significant impact.

Construction of the Build Alternative would involve substantial grading and earth moving activities, stockpiling of soils, and the loading, unloading, and transport of excavated and fill material. Rainfall could carry loose soils into adjacent waterways, resulting in increased sedimentation and the potential for impacts to water quality. Construction equipment debris and fuel could also further degrade the quality of storm water runoff if fueling activity and maintenance products are not handled properly. This contamination could potentially impact nearby waterways, including the jurisdictional water features within the BSA. The Build Alternative would also add approximately 29 acres of new impervious area, the bulk of which would be added in Phase 1 (approximately 22 acres) through road widening and modifications to the existing roadway and ramps. Additional impervious area prevents runoff from naturally dispersing and infiltrating into the ground, resulting in increased concentrated flow. The additional flow has the potential to transport an increased amount of sediment and pollutants to waterways and water resources, plus potentially create increased erosion resulting from changes to waterway hydrographs (flow versus time) pre- and post-construction. A combination of permanent and temporary BMPs (**Measures WQ 1** through **WQ-3**), as well as work windows (**Measure BIO-6**), will be incorporated as part of the design and construction of the project. In consideration of the BMPs and work windows to be incorporated into the design of the project, indirect impacts to jurisdictional water features will be less-than-significant.

California Tiger Salamander, California Red-Legged Frog, Alameda Whipsnake

California tiger salamanders, California red-legged frogs, and Alameda whipsnakes may suffer direct harassment, harm, injury, or mortality as a result of construction activities. Construction activities that could affect these species include initial site preparation, during use of heavy equipment for excavation and backfill, and during handling of stockpiles and stored materials (construction staging). Construction activities associated with the Build Alternative would have temporary and permanent effects on various habitat types that provide upland, foraging, and dispersal habitats for these protected species. These effects are summarized in **Table 2.3.5-1** by acreage for each habitat type. Temporary and permanent impacts to Threatened and Endangered species habitat are considered a potentially significant impact.

Oak Woodlands

Of the various habitat types present within the BSA, oak woodlands are considered sensitive. As described in greater detail in Section 2.3.1, Natural Communities, the Build Alternative would result in direct and indirect impacts totaling 1.22 acres of oak woodland, all of which would occur with Phase 1. Direct and indirect impacts to oak woodlands are considered a significant impact under CEQA.

Central California Coast DPS Steelhead

As described in **Section 2.3.5, Threatened and Endangered Species**, a fish ladder is scheduled to be installed at the BART weir that would allow for fish passage between San Francisco Bay and the Alameda Creek watershed. As construction of the fish ladder is anticipated to begin in 2016, any steelhead potentially occurring within the BSA is likely to be subject to protection under Federal Endangered Species Act (FESA) at the time of project construction. Because fish passage is scheduled to be restored to the Alameda Creek watershed prior to the anticipated start of project construction, this analysis addresses effects to a population of central California coast DPS steelhead that is not currently present within the BSA, but is expected to be present within Alameda Creek at the time of project construction. Potentially significant impacts may result from the following: loss of natural bed or bank; debris transport impedance; short-term release of contaminants; loss or decline of riparian habitat; decline of vegetative diversity; loss of in-stream channel habitat; change to, or loss of natural bed substrate; direct take of fish; hydroacoustic effects[2] to fish by pile driving; and loss of shading from riparian vegetation. Steelhead could be indirectly impacted by erosion or sedimentation during construction, since water quality is an important aspect of steelhead habitat.

A number of avoidance and minimization measures have been identified to reduce impacts of the Build Alternative on biological resources (see **Section 2.3.7, Avoidance and Minimization Measures Included in the Project Design**). In summary, these measures include provisions that would require:

- assignment of qualified biological monitor(s) during construction
- implementing worker environmental awareness training
- preventing inadvertent entrapment of special-status species during construction
- implementing seasonal restrictions and work windows for certain construction activities
- conducting pre-construction species surveys
- minimization of bat and bird disturbance during bridge widening and tree removal
- proper vehicle use near sensitive natural communities
- limiting nighttime construction and artificial nighttime lighting to the maximum extent practicable
- maintaining good housekeeping practices regarding food-related trash items and pets; and restrict firearms

[2] negative effects on fish from underwater sound pressure during pile driving

- implementing local tree preservation policies for tree removal outside of state right-of-way
- complying with the biological opinion
- complying with the Executive Order on Invasive Species (EO 13112)

Potential impacts to water quality during construction and project operation would be avoided and reduced by best management practices (BMPs) that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality**; **Measures WQ-1, WQ-2,** and **WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA were maintained for the special-status species that could be present in this aquatic habitat.

Although the project contains avoidance and minimization measures that would minimize impacts to oak woodlands; jurisdictional water features; and habitats suitable for the protected California tiger salamander, California red-legged frog, Alameda whipsnake, and central California coast DPS steelhead; significant impacts would occur, and therefore mitigation measures are proposed to offset the impacts to these resources. Implementation of **Mitigation Measures BIO-A** through **BIO-F** described in **Section 3.6** below would reduce the potential impacts to biological resources including wetlands, Threatened and Endangered species, oak woodlands, other special-status species and Central California Coast Steelhead to less-than-significant.

PALEONTOLOGY

Impact PAL-1: Implementation of the Build Alternative could have an adverse effect on previously undiscovered paleontological resources.

Implementation of **Mitigation Measure PAL-A** described in **Section 2.2.4, Paleontology**, and **Section 3.6, Mitigation Measures for Significant Impacts Under CEQA**, would reduce this impact to a less-than-significant level.

NOISE

Impact NOI-A: Implementation of the Build Alternative would result in a substantial permanent increase in ambient noise levels.

The CEQA Checklist defines a significant noise impact as an increase in noise levels “in excess of the standards established in the local general plan or noise ordinance…” Typically, work taking place within the Caltrans right-of-way is not subject to local noise ordinances. However, Caltrans will work to meet the following local requirements where feasible:

- In accordance with Policy 6-I-8 of the City of Milpitas General Plan Noise Element, the Build Alternative would be required to limit project-related noise increases to no more than 3dB or more than 65 dB at the property line of residential areas.

- In accordance with Policy 10-8.3 of the City of Fremont General Plan Safety Element, the Build Alternative would be required to evaluate noise abatement options under the following circumstances: 1) the project would cause the Ldn to increase by 5 dBA or more but would remain below 60 dBA, or; 2) the project would cause the Ldn to increase by 3 dBA or more and exceed 60 dBA, or; 3) the project has the potential to generate significant adverse community response due to the unusual character of the noise.
- In accordance with Policy 1, Program 1.3 of the City of Pleasanton General Plan Noise Element, an exterior increase of more than 4 dB is considered significant.

Section 2.2.7, Noise, provides a detailed analysis of the projected noise increases for both year 2020 and 2040 conditions (with and without the Build Alternative). With the exception of one location, noise increases under both the 2020 and 2040 Build Alternative conditions generally range from 0 to 1 dBA, which is not considered a significant noise impact by any of the local noise ordinances. However, a significant noise level increase of 15 dBA would occur at one location within Fremont (Segment 7 of the noise study area), where portions of an existing 8 to 14-foot high barrier would be removed under the Build Alternative.

Implementation of **Mitigation Measure NOI-A** described in **Section 3.6, Mitigation Measures for Significant Impacts Under CEQA**, would reduce this impact to a less-than-significant level. With incorporation of **Mitigation Measure NOI-A** the Build Alternative will be consistent with City of Fremont General Plan.

3.2.4 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL EFFECTS

The Build Alternative would not result in any environmental impacts that would remain significant after mitigation measures are incorporated.

3.2.5 GROWTH-INDUCING IMPACTS

Refer to the discussion in **Section 3.2.2, Less-than-Significant Effects of the Proposed Project** (*Population and Housing)*. Because the Build Alternative would not encourage growth beyond what is already planned for and forecasted, it would not add to the cumulative effects on resources of concern.

3.2.6 CUMULATIVE IMPACTS

The cumulative impacts of the Build Alternative are discussed in detail in **Section 2.4, Cumulative Impacts**. Please refer to the section of this document for a complete discussion regarding cumulative impacts.

ISSUES WITH NO CUMULATIVE IMPACT

Implementation of the Build Alternative would have no impact to land use; parks and recreational facilities; forestry resources; mineral resources; traffic and transportation/pedestrian improvements; and energy conservation. Additionally, geological/seismic hazards or hazardous materials/hazardous wastes have localized impacts and do not contribute to a cumulative impact.

ISSUES WITH THE POTENTIAL TO CONTRIBUTE TO A CUMULATIVE EFFECT

Growth; farmlands; utilities/emergency services; visual/aesthetics; cultural resources and paleontology; hydrology and water quality; and air quality in combination with planned and foreseeable projects listed in **Table 2.4.2.1**, planned transportation projects, and the Build Alternative were evaluated for cumulative impacts. Based on the evaluation, as described in detail in Section 2.4, the Build Alternative, in combination with planned and foreseeable projects would have a less than significant cumulative impact to these resources.

Significant cumulative impacts to the noise and biology resources were identified.

Noise

In regard to noise, a substantial noise level increase of 15 dBA would occur as a result of the project at one location within Fremont (segment 7 of the noise study area), where portions of an existing 8 to 14-foot high barrier would be removed under the Build Alternative. In this location, the project would have a considerable contribution to a cumulative effect. To address this noise increase, Caltrans intends to incorporate noise abatement in the form of a replacement noise barrier (NB Wall 13), located along northbound I-680, between Palm Avenue and Mission Boulevard (see **Mitigation Measure NOI-A**), as shown in **Appendix H**. Incorporation of this mitigation measure would offset the Build Alternative's contribution to a significant noise cumulative impact.

Biological Resources

The area of cumulative analysis for biological resources includes the Biological Study Area (BSA) identified for the Build Alternative plus any immediately adjacent lands and waterways containing sensitive biological resources (sensitive habitats or protected plant or animal species). The planned and approved transportation improvements and land use developments listed in **Table 2.4.2-1** and the Build Alternative are not located in designated critical habitat areas where threatened and endangered species, such as California tiger salamanders, California red-legged frogs, and Alameda whipsnakes are expected to occur. Given this, there would be no cumulative impact to critical habitat.

Future transportation improvements and land use developments have an unknown and unquantifiable effect on special-status species and potential biologically sensitive habitats. Although not quantifiable, it is assumed that the implementation of the planned and foreseeable improvements may result in the degradation of wildlife habitat through a variety of actions which, when combined with the Build Alternative, may result in a cumulative impact to biological resources as described below.

With the exception of a handful of projects planned in Fremont, the future land use development along the project limits includes in-fill residential/commercial improvements where local waterways and other riparian features do not exist. The built-up urban environments do not provide the necessary habitat or connectivity to known habitat that special-status species, including threatened and endangered species in this region need. However, there are several local waterway crossings and riparian features (i.e., creeks, drainage ditches and small ponds) along the project limits and surrounding areas that represent potential habitat for California Tiger Salamanders, western pond turtles, central California coast DPS steelhead, and California red-legged frogs (see development ID Nos. 9, 10, 11, 13, 16, 17, 18, 21, and 23 in **Figure 2.1-2b**). Additionally, the low-density urban areas and foothills near the planned developments Nos. 9, 13 and 14 (see **Figure 2.1-2b**) may provide enough space and natural vegetation to support wildlife like the Alameda whipsnake, western burrowing owls, American badger, San Francisco dusky-footed woodrat, and San Joaquin kit fox. Furthermore, increased development and disturbance created by human activities (i.e., fires, increased nighttime lighting, etc.) would result in the direct mortality, habitat loss, and deterioration of habitat suitability.

The effects of these projects would be assessed as part of their separate agency consultation and permitting processes. Compliance with the regulations and adherence to the required permitting processes would ensure that there are no unmitigated effects resulting from projects in the region. In addition, the San Francisco Public Utilities Commission is currently preparing a Section 10 consultation effort, known as a Habitat Conservation Plan (HCP), for continued operations and maintenance of the Alameda Creek watershed. The HCP will contain substantial mitigation and protective measures for sensitive species in the Alameda Creek watershed.

The physical footprint of the proposed Build Alternative improvements would require a moderate amount of tree removal. Similarly, the physical footprint for the planned land use developments listed in **Table 2.4.2-1** and future transportation improvements would also require varying degrees of tree removal that would be reviewed and/or permitting during the individual project approval processes. The future transportation projects could also require bridge widening at bridges along I-680, I-580, and State Route 84. Tree removal for the planned and programed projects, in combination with the tree removal implemented under the Build Alternative, would reduce the amount of potential nesting habitat for a number of bird species protected under the Migratory Bird Species Act. Additionally, bridge widening or tree removal could result in direct impacts to special-status bat species. Therefore, the planned and programmed projects in the area, in combination with the Build Alternative, could result in cumulative impact to trees and related nesting species, as well as special-status bat species.

Water quality during construction and project operation would be protected by best management practices (BMPs) that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures WQ-1, WQ-2, and WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA were maintained for the special-status species, including central California coast DPS steelhead that could be present in this aquatic habitat.

In addition to the measures that would protect the water quality of aquatic habitats, the Build Alternative includes a number of avoidance and minimization measures that are considered part of the project design and apply to all of the proposed improvements under the Build Alternative(see **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**). In summary, these measures include provisions that would require:

- assignment of qualified biological monitor(s) during construction
- implementing worker environmental awareness training
- preventing inadvertent entrapment of special-status species during construction
- implementing seasonal restrictions and work windows for certain construction activities
- conducting pre-construction species surveys
- minimization of bat and bird disturbance during bridge widening and tree removal
- proper vehicle use near sensitive natural communities
- limiting nighttime construction and artificial nighttime lighting
- maintaining good housekeeping practices regarding food-related trash items and pets; and restrict firearms
- implementing local tree preservation policies for tree removal outside of state right-of-way
- adherence to the conservation measures and terms of the biological opinion
- complying with the Executive Order on Invasive Species (EO 13112)

These avoidance measures would be implemented prior to and during construction activities, and would be included as part of the special provisions of the construction bid package for the project. Implementation of the avoidance and minimization measures included in the project design would avoid adverse effects to the majority of the wildlife species within the BSA. Significant effects that would not be avoided and/or reduced through the implementation of the avoidance measures include the direct displacement of oak woodlands; jurisdictional water features; and habitats suitable for the protected California tiger salamander, California red-legged frog, Alameda whipsnake, central California coast DPS steelhead. Therefore, compensatory mitigation measures have been proposed. Implementation of **Mitigation Measures BIO-A** through **BIO-F**, in combination with the avoidance measures, would offset impacts to the direct displacement of oak woodlands, jurisdictional water features, and threatened and endangered species. Given this, incorporation of the minimization and mitigation measures would reduce the Build Alternative's contribution to cumulative biological impacts to less-than-significant.

3.2.7 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 greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

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

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light duty trucks, other trucks, buses, and motorcycles make up the largest source (second to electricity generation) of GHG emitting sources. The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions in order to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).[3]

There are four primary strategies for reducing 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/efficiencies. To be most effective all four strategies should be pursued cooperatively. [4]

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

3.3 REGULATORY SETTING

3.3.1 STATE

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

Assembly Bill 1493 (AB 1493), Pavley. Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

Executive Order S-3-05 (EO): (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 the 2020, and 3) 80 percent below the year 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

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

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

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

Senate Bill 97 (SB 97) Chapter 185, 2007, Greenhouse Gas Emissions: required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board (ARB) to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

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

3.3.2 FEDERAL

Although climate change and GHG reduction is a concern at the federal level; currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level GHG analysis.[5] FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process, from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

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

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

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

U.S. EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the

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

Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions. U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010. [6]

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

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

On August 28, 2012, U.S. EPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

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

3.4 PROJECT ANALYSIS

3.4.1 BUILD ALTERNATIVE

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions

[6] http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq. Last accessed May 29, 2014.

when combined with the contributions of all other sources of GHG.[7] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, the ARB released the GHG inventory for California (forecast last updated: October 28, 2010). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented (see **Figure 3-1**). The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

Caltrans and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.[8]

One of the main strategies in Caltrans' Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide (CO_2) from mobile sources, such as automobiles occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0-25 miles per hour (see **Figure 3-2**). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO_2, may be reduced.

The Build Alternative intends to relieve existing traffic congestion and improve traffic flow on the local roadway network for approved redevelopment and planned growth in the area. As shown in **Table 2.1.7-10** in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, under 2040 conditions, the Build Alternative would distribute the projected increases in traffic volumes along the I-680 corridor, reduce the bottleneck around Washington Boulevard, and provide additional capacity for use by high occupancy vehicles and toll-paying single occupant vehicles. The effects of the Build Alternative would result in an increased throughput and more efficient operations of the I-680 corridor.

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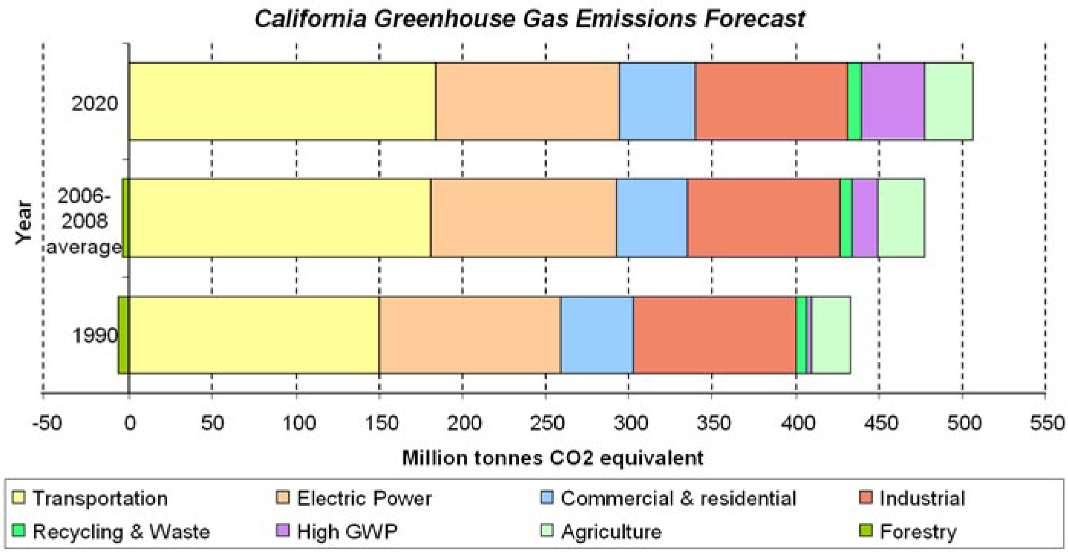
7 This approach is supported by the AEP: Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and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

8 Caltrans Climate Action Program is located at the following web address: http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf. Last accessed May 29, 2014.

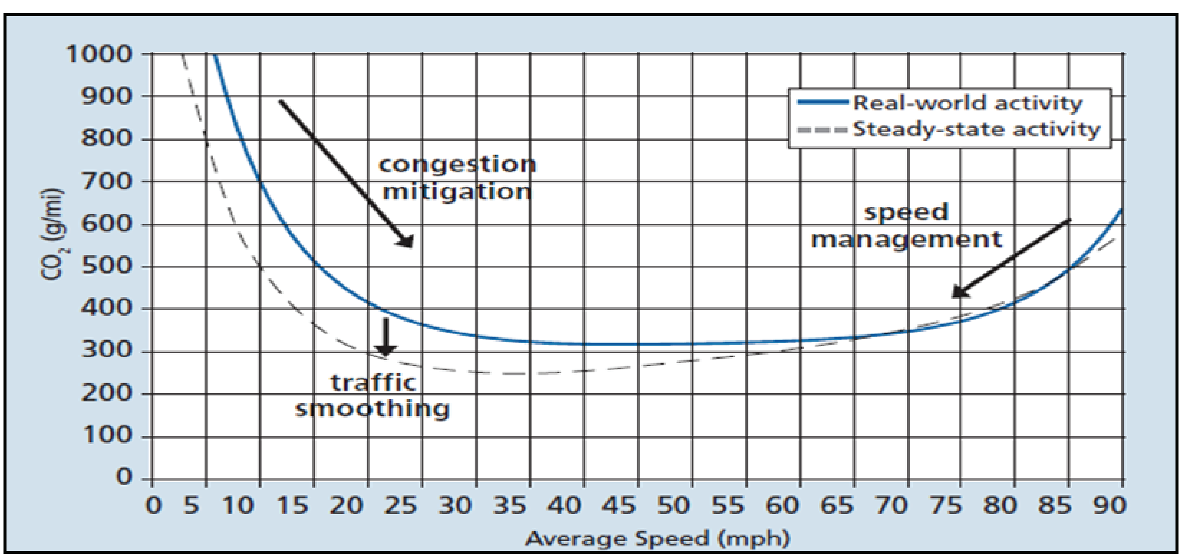


California Greenhouse Gas Emissions Forecast

Figure

3-1

Source: California Air Resources Board, 2010



Possible Effect of Traffic Operation Strategies in Reducing On-Road CO_2 Emissions

Figure

3-2

Source: Matthew Barth and Kanok Boriboonsomsin , Traffic Congestion and Greenhouse Gases, TR News 268 May-June 2010

When compared to the No-Build Alternative, the Build Alternative would increase the average travel speed by 33 percent, accommodate more traffic with the vehicle miles of travel increasing by 14 percent, while the overall time spent traveling would be reduced by 13 percent. The amount of delay experienced by travelers in 2040 would decrease by 29 percent with the implementation of the Build Alternative.

Neither the Build nor No-Build Alternative would provide enough capacity to serve all of the vehicle demand in 2040. The No-Build Alternative would serve 88 percent of the peak period demand, while the Build Alternative would accommodate 92 percent. There would be multiple intermediate bottlenecks along the I-680 corridor (such as at SR 262 and at the lane drop at SR 84 East). The queues resulting from those bottlenecks would merge together during the peak commute hour, resulting in slow speeds (0-24 miles per hour) and LOS F conditions along much of the traffic study area. Under the Build Alternative, the length of the most severe traffic queue would be substantially shorter than in the No-Build scenario; the full extent of the southernmost queue is estimated to extend for about 5 miles outside of the traffic study area, as compared to 13 miles under the No-Build Alternative. The HOV/express lane would operate at LOS D or better, with average travel speeds of 42 mph or faster.

Table 3.4.1-1 shows project GHG emissions expressed in metric tons per day of CO_2. GHG emissions are presented with and without the Pavley and LCFS requirements. Even with an increase in vehicular traffic under the Build Alternative, GHG emissions are predicted to be lower than the existing emissions mostly due to the effect of the Pavley and LCFS requirements.

Table 3.4.1-1 CO_2 Emissions in Metric Tons per Day

CO_2 Emissions[A]	Existing (2013)	2020 No-Build	2020 Phase 1	2020 Build	2040 No-Build	2040 Phase 1	2040 Build
CO_2 without Pavley + LCFS[B]	487	543	545	545	667	748	703
CO_2 with Pavley +LCFS	479	411	411	411	454	508	477
Increase over Existing with Pavley +LCFS	--	-68	-68	-68	-25	29	-2

Notes:
A. CO_2 emissions were estimated using the Caltrans-Emfac model with EMFAC2011 emission factors and utilizing the average peak and off-peak period traffic volumes and speeds provided in the Traffic Operations Analysis Report prepared for the project (Caltrans, 2014n). Average peak period and off-peak period emission calculations were combined to generate an average daily emission total.
B. LCFS = Low Carbon Fuel Standard
Source: Caltrans, 2014a

After applying Pavley and LCFS reductions to future emission rates, daily CO_2 GHG emissions under 2020 Build Alternative conditions were estimated to be 68 metric tons per day less than emissions under existing conditions. By year 2040, the difference between emissions from Build and existing conditions would be reduced to 2 metric tons per day, due to a substantial increase in traffic in 2040. Under the Phase 1 project the CO2 GHG emissions would increase over the existing conditions due to lower speeds and with higher traffic volumes. However, when compared to the No-Build future conditions, the project would have slightly higher emissions (i.e., less than 0.5 percent) due to greater estimated traffic throughput for the HOV/express lane facility.

These calculated CO_2 emissions provide for comparison between alternatives. The numbers are not necessarily an accurate reflection of what the true CO_2 emissions will be, because CO_2 emissions are dependent on other factors that are not part of the model such as the fuel mix, rate of acceleration, and the aerodynamics and efficiency of the vehicles.[9] This analysis does not look at the changes in CO_2 emissions translated throughout the entire Bay Area transportation network. This type of analysis is conducted at a transportation plan level.

The current regional transportation plan (RTP) for the San Francisco Bay Area, known as Plan Bay Area, was adopted by Metropolitan Transportation Commission's (MTC) on July 18, 2013 and was approved by Caltrans August 12, 2013. Plan Bay Area grew out of "The California Sustainable Communities and Climate Protection Act of 2008" (SB 375), which requires each of the state's 18 metropolitan areas, including the San Francisco Bay Area, to reduce greenhouse gas emissions from cars and light trucks. Key elements of SB 375 include the requirement that the San Francisco Bay Area and other California regions develop a SCS, a new element of the RTP, to strive to reach the GHG reduction target established for each region by the California Air Resources Board. The San Francisco Bay Area's target is a 7 percent per capita reduction in GHG by 2020 and a 15 percent per capita reduction by 2035. Plan Bay Area is the region's first RTP subject to SB 375. In the Plan Bay Area, the land use and housing assumptions for the SCS include demonstration of how the development pattern and the transportation network can work together to reduce GHG emissions.

The proposed project (RTP Reference No. 22042) is included in the regional emissions analysis conducted by MTC for the Plan Bay Area. The design concept and scope of the proposed Build Alternative is consistent with the project description in the Plan Bay Area, and the traffic assumptions of the MTC's regional emissions analysis.

3.4.2 TRANSPORTATION SYSTEM MANAGEMENT AND TRANSPORTATION DEMAND MANAGEMENT ALTERNATIVES

System management strategies increase the efficiency of existing transportation facilities without increasing the number of through lanes. Examples of system management strategies include ramp metering, auxiliary lanes, turning lanes, reversible lanes and traffic signal coordination. System management also encourages a unified urban transportation system that integrates multiple forms of transportation modes such as pedestrian, bicycle,

[9] EMFAC2011 model emission rates are only for direct engine-out CO_2 emissions not full fuel cycle; fuel cycle emission rates can vary dramatically depending on the amount of additives like ethanol and the source of the fuel components.

automobile, rail, ferry, and mass transit. **Section 1.3.3, Alternative Considered but Eliminated from further Consideration**, includes a discussion of the various alternatives that were considered but were eliminated because of feasibility and physical constraints, or because they did not meet the project's identified purpose and need. Alternatives that would only include transit-related improvements were not considered, as they would not satisfy the project's purpose in implementing the AB 2032 authorized express lanes and providing similar benefits for commuters using the existing southbound I-680 HOV/express lane. Although Transportation System Management measures alone could not satisfy the purpose and need of the project, the following Transportation System Management measures have been incorporated into the Build Alternative for this project:

- constructing auxiliary lanes along I-680
- adding Class II bicycle lanes at Sheridan Road and Athenour Way
- modifying signalized intersection at northbound I-680/SR 238 on-ramp termini, reconstruct sidewalk, and Realign northbound I-680/SR 238 loop on-ramp termini square to the cross street, modify signalized intersection, and install American Disabilities Act (ADA) elements and crosswalk markings

There are several transportation demand management strategies within the San Francisco Bay Area that are used to reduce the number of vehicle trips within the I-680 corridor. Rideshare offers carpoolers reduced bridge tolls as well as access to carpool lanes. There are also vanpools for larger groups of commuters. Transportation demand management may also involve the provision of contract funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. Increased vehicle occupancy reduces traffic volumes during peak commuting periods; however, without the construction of the improvements described above, successful implementation of a transportation demand management alternative would not substantially improve the safety and operation of the freeway.

3.4.3 CONSTRUCTION EMISSIONS

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

Currently, neither Caltrans nor BAAQMD have adopted GHG significance thresholds that apply to construction activities. For informational purposes, average construction period GHG emissions from project implementation were calculated using the current version of the Roadway Construction Emissions Model (RoadMod), developed by the Sacramento

Metropolitan Air Quality Management District. Construction period GHG emissions were modeled using the construction year 2017, total expected duration 17 months, and entire length of the project limits. GHG emissions are estimated to be 1,110 metric tons of CO_2 over the course of the entire construction of the Build Alternative. With innovations such as longer pavement lives, improved traffic management plans, and changes in roadway construction materials, the GHG emissions produced during construction can be reduced to some degree by longer intervals between maintenance and rehabilitation events.

3.4.4 LIMITATIONS AND UNCERTAINTIES WITH MODELING

EMFAC

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO_2 emissions due to impacts on traffic. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008) and a 2009 University of California study[10], brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO_2 emissions during a typical urban trip. Current emission-factor models are insensitive to the distribution of such modal events (i.e., cruise, acceleration, deceleration, and idling) in the operation of a vehicle and instead estimate emissions by average trip speed. This limitation creates an uncertainty in the model's results when compared to the estimated emissions of the various alternatives with baseline in an attempt to determine impacts. Although work by EPA and the CARB is underway on modal-emission models, neither agency has yet approved a modal emissions model that can be used to conduct this more accurate modeling.

CARB is currently not using EMFAC to create its inventory of greenhouse gas emissions. It is unclear why the CARB has made this decision. Their website only states:

> REVISION: Both the EMFAC and OFFROAD Models develop CO_2 and CH_4 [methane] emission estimates; however, they are not currently used as the basis for [CARB's] official [greenhouse gas] inventory which is based on fuel usage information. However, ARB is working towards reconciling the emission estimates from the fuel usage approach and the models.[11]

[10] Matthew Bartha, Kanok Boriboonsomsin. 2009. *Energy and emissions impacts of a freeway-based dynamic eco-driving system.* Transportation Research Part D: Transport and Environment Volume 14, Issue 6, August 2009, Pages 400–410

[11] http://www.arb.ca.gov/msei/offroad.htm. Last accessed May 29, 2014.

Other Variables

With the current science, project-level analysis of greenhouse gas emissions has limitations. Although a greenhouse gas analysis is included for this project, there are numerous key greenhouse gas variables that are likely to change dramatically during the design life of the proposed project and would thus dramatically change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2012 ,"[12] which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy has improved each year beginning in 2005, and is now at a record high. Corporate Average Fuel Economy (CAFE) standards remained the same between model years 1995 and 2003 and subsequently began setting increasingly higher fuel economy standards for future vehicle model years. The EPA estimates that light duty fuel economy rose by 16% from 2007 to 2012.

Table 3.4.4-1 shows the increases in required fuel economy standards for cars and trucks between Model Years 2012 and 2025 as available from the National Highway Traffic Safety Administration for the 2012-2016 and 2017-2025 CAFE Standards.

Table 3.4.4-1 Average Required Fuel Economy (mpg)

Vehicle Type	2012	2013	2014	2015	2016	2018	2020	2025
Passenger Cars	33.3	34.2	34.9	36.2	37.8	41.1-41.6	44.2-44.8	55.3-56.2
Light Trucks	25.4	26	26.6	27.5	28.8	29.6-30.0	30.6-31.2	39.3-40.3
Combined	29.7	30.5	31.3	32.6	34.1	36.1-36.5	38.3-38.9	48.7-49.7

Source: EPA 2013, http://www.epa.gov/fueleconomy/fetrends/1975-2012/420r13001.pdf. Last access May 29, 2014.

Second, near zero carbon vehicles will come into the market during the design life of this project. According to the 2013 Annual Energy Outlook (AEO2013):

> "LDVs that use diesel, other alternative fuels, hybrid-electric, or all-electric systems play a significant role in meeting more stringent GHG emissions and CAFE standards over the projection period. Sales of such vehicles increase from 20 percent of all new LDV sales in 2011 to 49 percent in 2040 in the AEO2013 Reference case."[13]

[12] http://www.epa.gov/oms/fetrends.htm. Last accessed May 29, 2014.
[13] http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf. Last accessed May 29, 2014.

The greater percentage of alternative fuel vehicles on the road in the future will reduce overall GHG emissions as compared to scenarios in which vehicle technologies and fuel efficiencies do not change.

Third, California has recently adopted a low-carbon transportation fuel standard in 2009 to reduce the carbon intensity of transportation fuels by 10 percent by 2020. The regulation became effective on January 12, 2010 (codified in title 17, California Code of Regulations, Sections 95480-95490). Beginning January 1, 2011, transportation fuel producers and importers must meet specified average carbon intensity requirements for fuel in each calendar year.

Lastly, driver behavior has been changing as the U.S. economy and oil prices have changed. In its January 2008 report, "Effects of Gasoline Prices on Driving Behavior and Vehicle Market,"[14] the Congressional Budget Office found the following results based on data collected from California: 1) freeway motorists adjust to higher gas prices by making fewer trips and driving more slowly; 2) the market share of sports utility vehicles is declining; and 3) the average prices for larger, less-fuel-efficient models declined from 2003 to 2008 as average prices for the most-fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles. More recent reports from the Energy Information Agency[15] and Bureau of Economic Analysis[16] also show slowing re-growth of vehicle sales in the years since its dramatic drop in 2009 due to the Great Recession as gasoline prices continue to climb to $4 per gallon and beyond.

Limitations and Uncertainties with Impact Assessment

Taken from p. 5-22 of the National Highway Traffic Safety Administration Final EIS for MY2017-2025 CAFE Standards (July 2012), **Figure 3-3** illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

"Moss and Schneider (2000) characterize the 'cascade of uncertainty' in climate change simulations **Figure 3-3**). As indicated in **Figure 3-3**, the emission estimates used in the EIS have narrower bands of uncertainty than the global climate effects, which are less uncertain than regional climate change effects. The effects on climate are, in turn, less uncertain than the impacts of climate change on affected resources (such as terrestrial and coastal ecosystems, human health, and other resources […] Although the uncertainty bands broaden

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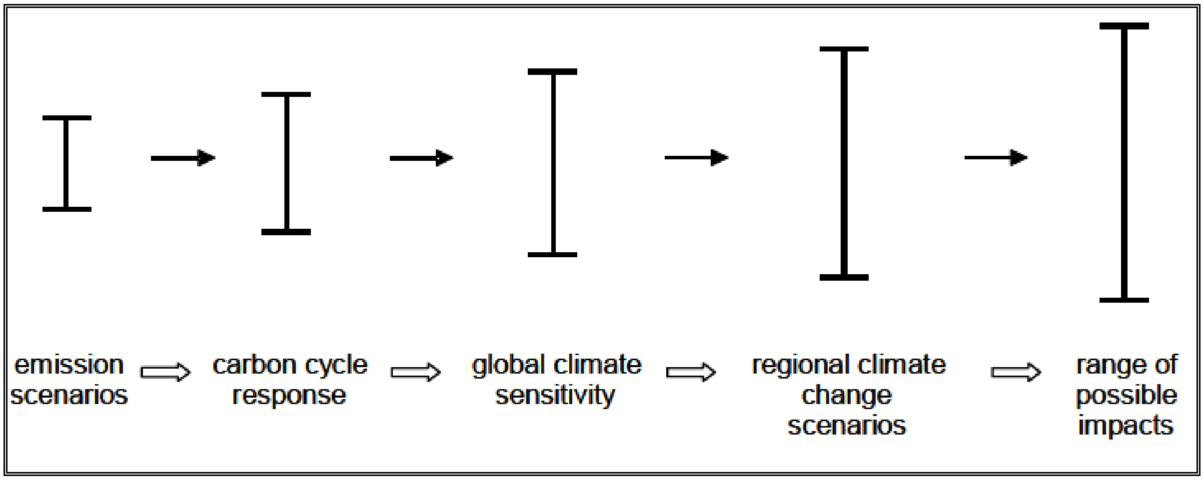
[14] http://www.cbo.gov/ftpdocs/88xx/doc8893/01-14-GasolinePrices.pdf. Last accessed May 29, 2014.

[15] http://www.eia.gov/oiaf/aeo/tablebrowser/aeo_query_server/?event=ehExcel.getFile&study=AEO2013&region=0-0&cases=ref2013-d102312a&table=114-AEO2013&yearFilter=0. Last accessed May 29, 2014.

[16] Historical Vehicle Sales: http://www.bea.gov/national/xls/gap_hist.xls. Last accessed May 29, 2014.

with each successive step in the analytic chain, all values within the bands are not equally likely; the mid-range values have the highest likelihood."[17]

Figure 3-3 Cascade of Uncertainties



Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what any modeled increase in CO_2 emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO_2 equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to project potential future global greenhouse gas emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce greenhouse gas emissions. Non-mitigation IPCC scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons CO2 from 2000 to 2030, which represents an increase of between 25 and 90%.[18]

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather than causing "new" greenhouse gas emissions. It is difficult to assess the extent to which any project level increase in CO_2

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[17] http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf. page 5-22. Last accessed May 29, 2014.
[18] Intergovernmental Panel on Climate Change (IPCC). February 2007. Climate Change 2007: The Physical Science Basis: Summary for Policy Makers. http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf. Accessed May 29, 2014.

emissions represents a net global increase, reduction, or no change; there are no models approved by regulatory agencies that operate at the global or even statewide scale.

3.5 CEQA CONCLUSION

As discussed above, both the future with project and future no build show increases in CO_2 emissions over the existing levels; the future build CO_2 emissions are higher than the future no build emissions. In addition, as discussed above, there are also limitations with EMFAC and with assessing what a given CO_2 emissions increase means for climate change. Therefore, it is Caltrans determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

3.5.1 GREENHOUSE GAS REDUCTION STRATEGIES

AB 32 COMPLIANCE

Caltrans continues to be involved on the Governor's Climate Action Team as ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from then-Governor Arnold Schwarzenegger's California Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO_2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in **Figure 3-4**: The Mobility Pyramid.

Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans works closely with local jurisdictions on planning activities but does not have local land use planning authority.

Caltrans also assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by U.S. EPA and ARB.

Caltrans is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill (SB) 375 (Steinberg 2008), SB 391(Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32.

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs.

Figure 3-4 Mobility Pyramid

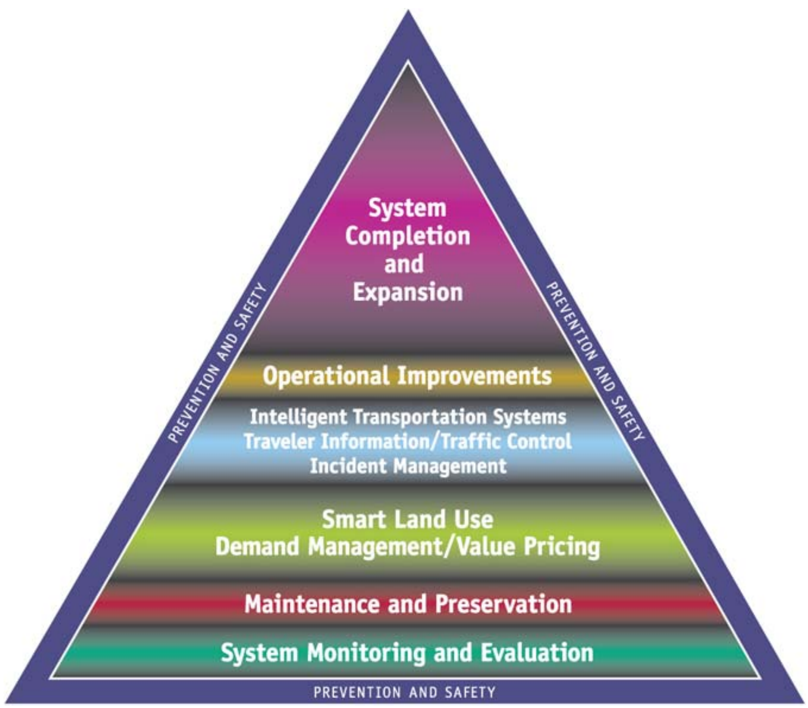

Table 3.5.1-1 summarizes the Departmental and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012): is intended to establish a policy that will ensure coordinated efforts to incorporate climate change into Caltrans' decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)[19] provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

The following measures would also be included under the Build Alternative to reduce the GHG emissions and potential climate change impacts from the project. These measures apply to the entire Build Alternative, including Phase 1.

- According to Caltrans Standard Specifications, the contractor must comply with all of the local Air Pollution Control District's rules, ordinances, and regulations regarding air quality restrictions. The BAAQMD CEQA Guidelines provide feasible control measures for construction emissions. One of the measures that would be implemented under the Build Alternative includes minimizing idling times of construction equipment either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

ADAPTATION STRATEGIES

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

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency report on October 28, 2011[20], outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions

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[19] http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml
[20] http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation. Last accessed May 29, 2014.

in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

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

The California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state, and federal public and private entities to develop. The California Climate Adaptation Strategy (Dec 2009)[21], which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

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

The National Academy of Science was directed to prepare a Sea Level Rise Assessment Report[22] to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

- the relative sea level rise projections for California, Oregon, and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates

[21] http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF. Last Accessed May 29, 2014.

[22] *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389. Last accessed May 29, 2014.

- the range of uncertainty in selected sea level rise projections
- a synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems
- a discussion of future research needs regarding sea level rise
- In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

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

All projects that have filed a Notice of Preparation (NOP) as of the date of the EO S-13-08, and/or are programmed for construction funding through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines.

The proposed project is outside the coastal zone and direct impacts to transportation facilities due to projected sea level rise are not expected.

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

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

Table 3.5.1-1 Climate Change/CO_2 Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.07	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, ARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34

Strategy	Program	Partnership		Method/Process	Estimated CO2 Savings (MMT)	
		Lead	Agency		2010	2020
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	Cal EPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

Source: Caltrans, 2013
Note: CalEPA – California Environmental Protection Agency; ARB - Air Resources Board; CEC – California Energy Commission

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

3.6 MITIGATION MEASURES FOR SIGNIFICANT IMPACTS UNDER CEQA

Mitigation Measure PAL-A: Monitoring and Mitigation Program. Prior to construction, a qualified professional paleontologist (as defined by SVP [2010] and Caltrans SER) should be retained to both design a monitoring and mitigation program, and implement the program during project-related excavation and earth disturbance activities. The paleontological resource monitoring and mitigation program should include:

- preconstruction coordination
- construction monitoring
- emergency discovery procedures
- sampling and data recovery, if needed
- preparation, identification, and analysis of the significance of fossil specimens salvaged, if any
- museum storage of any specimens and data recovered
- reporting

Prior to the start of construction, the professional paleontologist should conduct a field survey of exposures of sensitive stratigraphic units within the construction footprint that would be disturbed. Earth-moving construction activities should be monitored and inspected for the presence of potentially fossiliferous sediments. Monitoring would not need to be conducted in sediments that have been previously disturbed or in areas where exposed sediments would be buried, but not otherwise disturbed.

Prior to the start of construction, construction personnel involved with earth-moving activities should be informed that fossils could be discovered during excavating, that these fossils are protected by laws, on the appearance of common fossils, and on proper notification procedures should fossils be discovered. This worker training would be prepared and presented by a qualified professional paleontologist.

Mitigation Measure NOI-A: Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of a replacement noise barrier (NB Wall 13), located along northbound I-680, between Palm Avenue and Mission Boulevard. Replacement barrier

NB Wall 13 would replace portions of the existing soundwall that would be removed under the Build Alternative, with an equivalent height of 14 feet. Calculations based on preliminary design data indicate that the barrier will reduce noise levels by 14 to15 dBA for ten residences at a cost of $1,675,680. If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision of the noise abatement will be made upon completion of the project design and the public involvement processes.

Mitigation Measure BIO-A: Compensatory Mitigation for Jurisdictional Water Features. Any impacts jurisdictional water features that cannot be recreated on-site shall be subject to formalized mitigation requirements of the regulatory agencies. A conceptual restoration and mitigation plan shall be prepared prior to permit applications to regulatory agencies. The on-site restoration of Waters of the U.S. combined with the implementation of other components of the conceptual restoration and mitigation plan will ensure no net loss of functions and values of Waters of the U.S.

The off-site mitigation ratio proposed for Waters of the U.S., including wetlands, under jurisdiction of the USACE, is 1:1 acres of mitigation per acre of permanent impact. The mitigation ratio proposed for temporary impacts is 1:1 acre of mitigation per acre of temporary impact. All of the mitigation for temporary impacts is anticipated to be achieved on-site by restoring impacted areas to pre-project conditions.

Off-site mitigation for permanent impacts is proposed through purchase of credits at an approved mitigation bank. A conceptual on-site restoration and mitigation plan would be included in the permit applications to regulatory agencies. This plan would include a native plant palette list, plant establishment period, success criteria, and a monitoring and reporting schedule that would be reviewed and approved by the regulatory agencies prior to project construction. In addition, under Section 401 of the Clean Water Act, the RWQCB may request or require mitigation as part of the Water Quality Certification. Caltrans would obtain this certification during the permitting phase of project development.

Table 2.3.2-2 in **Section 2.3.2, Wetlands and Other Waters,** summarizes the anticipated compensatory mitigation requirements of the Build Alternative, isolating Phase 1 and future phases calculations.

Mitigation Measure BIO-B: Compensatory Mitigation for the California Tiger Salamander. In order to meet the requirements of California Fish and Game Code Section 2081 for obtaining an Incidental Take Permit for the California tiger salamander, compensatory mitigation is proposed to satisfy the conditions of multiple agencies and jurisdictions including FESA and the CEQA process. **Table 2.3.5-2** in **Section 2.3.5, Threatened and Endangered Species,** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on and off-site restoration of California tiger salamander habitat, isolating the Phase 1 and future phases calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Mitigation Measure BIO-C: Compensatory Mitigation for the California Red-Legged Frog. In order to meet the requirements of the U.S. Fish and Wildlife Service for the California red-legged frog, compensatory mitigation is proposed. **Table 2.3.5-3** in **Section 2.3.5, Threatened and Endangered Species,** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on and off-site restoration of California red-legged frog habitat, isolating the Phase 1 and future phases calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Mitigation Measure BIO-D: Compensatory Mitigation for the Alameda Whipsnake. In order to meet the requirements of California Fish and Game Code Section 2081 for obtaining an Incidental Take Permit for the Alameda whipsnake, compensatory mitigation is proposed. **Table 2.3.5-4** in **Section 2.3.5, Threatened and Endangered Species,** summarizes the anticipated compensatory mitigation requirements of the Build Alternative for on and off-site restoration of Alameda whipsnake, isolating the Phase 1 and future phases calculations, respectively. Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

Mitigation Measure BIO-E: Compensatory Mitigation for Oak Woodlands. Approximately 1.22 acres of oak woodland would be impacted by project activities. Caltrans will provide native oak woodland compensation at a 1:1 acre ratio for impacts. Trees will be planted onsite in the project area to the maximum extent possible after the completion of roadway construction. Offsite planting areas near the project will be sought if onsite restoration cannot accommodate the acreage.

Mitigation Measure BIO-F: Potential Compensatory Mitigation for central California coast DPS steelhead. In order to meet the requirements of the National Marine Fisheries Service (NMFS), compensatory mitigation may be required for central California coast DPS steelhead in the event that downstream anadromous fish passage in Alameda Creek is restored prior to completion of the proposed project. As the NEPA-assigned federal action agency, Caltrans will follow the FHWA policy of mitigating for impacts to special-status species and habitats. Such mitigation, if necessary, will be developed during the permitting phase of this project. Because these fish are prevented from leaving the watershed by the existing BART weir, they are not currently considered to be anadromous central California coast DPS steelhead and do not receive protection under FESA. Instead, they are considered to be landlocked rainbow trout. If the fish passage is not constructed, no mitigation would be required.

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4.0 COMMENTS AND COORDINATION

4.1 DOCUMENT COORDINATION

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps Caltrans determine the necessary scope of environmental documentation, the level of analysis required, potential impacts, and mitigation measures as a result of project implementation, and related environmental requirements. Agency consultation and public participation for the proposed project have been accomplished through a variety of formal and informal methods, including project development team meetings, interagency coordination meetings, and public meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address and resolve project-related issues through early and continuing coordination.

4.1.1 PUBLIC AND AGENCY SCOPING PROCESS

Scoping for this project included the use of several channels of communication, including the Notice of Preparation (NOP), mailers, internet, and newspaper ads. In addition, two public scoping meetings were held to solicit comments from agencies and the community. All efforts were conducted to meet Caltrans Title VI goals to prevent discrimination. The scoping meetings were held on Wednesday, October 3, 2012 at Hearst Elementary School in Pleasanton between 6:30 PM and 8:30 PM and on Thursday, October 4, 2012 at Chadbourne Elementary School in Fremont from 6:30 PM to 8:30 PM.

A Public Attendee Observation Tally Sheet was completed by Caltrans staff for each scoping meeting. The tally sheet is used to obtain statistical data on the people attending the meetings. Observation on gender, ethnicity, disabilities, and age were made and documented. Based on personal observation and the information recorded on the tally sheets, a total of 22 people attended both meetings; 5 females and 17 males, of which, all were non-Hispanic ethnicity. No attendees had a physical disability. All attendees were over the age of 40 except for one individual.

The scoping meetings were organized in open house format, with informational stations displaying exhibit boards staffed by representatives from Caltrans, Alameda County Transportation Commission (Alameda CTC) and its consultant staff. The exhibit boards portrayed the following subjects: project map, description of the proposed project, how express lanes work, express lane access options being studied, environmental process, environmental studies to be performed, project timeline, and proposed improvements throughout the project limits. Attendees was encouraged to ask questions and to fill out and submit comment sheets at the meeting, or by mail or e-mail before the close of the scoping period (October 16, 2012).

A total of 20 written comments were submitted during the scoping period. Meeting attendees also provided verbal comments to the project team. Additionally, two letters were received from local agencies, including the Alameda County Water District and the City of Pleasanton. Common issues raised were regarding aesthetics, air and water quality, the environmental document, the auxiliary lanes, noise, funding, timeline, safety, and traffic. Relevant National Environmental Policy Act (NEPA)- and California Environmental Quality Act (CEQA)-related comments are addressed in **Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures**, and **Chapter 3.0, California Environmental Quality Act (CEQA) Evaluation**.

The concern of traffic, air quality, and noise impacts on northbound Interstate-680 (I-680), north of the project limits toward Interstate-580, (I-580) as well as potential increases in traffic congestion on local streets through Pleasanton, was raised by the City of Pleasanton during the scoping process. The evaluation of these impacts and effects on the local circulation system within Pleasanton is summarized in this chapter for informational purposes only.

EVALUATION OF PROJECT EFFECTS ON TRAFFIC WITHIN THE CITY OF PLEASANTON

In addition to the analysis of the potential effects from the project-related traffic on the northbound I-680 corridor, which is described in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, an evaluation of the effects of the project on the local circulation system within Pleasanton has also been conducted. This section summarizes the results of the extended traffic analysis for the City of Pleasanton (see **Appendix L**).

The evaluation of localized traffic effects for the City of Pleasanton is based on the Citywide Synchro model, which is maintained by Pleasanton and has recently been used in the July *2011 City of Pleasanton General Plan Housing Element Update*. This model was used to evaluate the potential impact from the Build Alternative on the local roadway network. The traffic volumes contained in this Synchro model reflect buildout conditions as identified in the Pleasanton General Plan, including existing traffic, and traffic anticipated from approved and pending developments. Future traffic forecasts that were generated for the Build Alternative analysis, which are based on applications of the Alameda CTC Travel Demand Forecasting Model, were then incorporated into the local traffic model. A total of 36 intersections throughout the City of Pleasanton were evaluated in this analysis.

Effects on Traffic Volumes in Pleasanton

As discussed in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, the Build Alternative would alleviate the bottleneck near Washington Boulevard and provide additional capacity for use by HOV users and toll-paying single-occupant vehicles. As a result of this additional capacity under the Build Alternative, the peak hour operations of the mixed-flow lanes would improve from State Route 237 (SR 237) up to Andrade Road. However, the addition of new capacity would also allow more traffic to pass through the project limits, resulting in a new bottleneck forming near the I-680/Bernal Avenue on-ramp, with peak hour queues that extend back to State Route 84 (SR 84).

The combined effect of these changes would cause an increase in peak hour traffic volumes at some of the interchanges in Pleasanton, particularly at Sunol Boulevard, and to a lesser extent at Stoneridge Drive. It is also anticipated that some of the traffic currently using the Bernal Avenue off-ramp would shift to use the Sunol Boulevard off-ramp due to the additional peak hour traffic congestion on the freeway between those two interchanges.

Long-Term Impacts on Local Roads in Pleasanton

As shown in **Table 4-1**, the additional interchange traffic caused by the Build Alternative is expected to affect a number of intersections throughout the City of Pleasanton. These effects are generally small, with average delay typically increasing by 1 or 2 seconds during the PM peak hour. The largest magnitude of change caused by the Build Alternative is at the Sunol Boulevard/Bernal Avenue intersection, where average delay would increase by 7 seconds and the level of service (LOS) would drop from D to E.[1] It should be noted that this intersection is located in the Pleasanton downtown area, which is exempt from vehicle LOS standards per the Pleasanton General Plan. All other intersections studied would operate at LOS D or better, which is acceptable per the Pleasanton General Plan, both with and without the implementation of the Build Alternative. These results indicate that the Build Alternative causes relatively small changes at some of the intersections studied, and none of the changes are of a magnitude that would cause unacceptable LOS operations per the Pleasanton General Plan policies.[2]

[1] Level of Service (LOS) is a measure of actual traffic conditions and the perception of such conditions by motorists. There are six LOS ratings, ranging from LOS A (free traffic flow with low traffic volumes and high speeds, resulting in low vehicle densities) to LOS F (traffic volumes exceeding the capacity of the infrastructure, resulting in forced flow traffic operations, slow speeds, and high vehicle densities). Traffic operations are evaluated based on the LOS criteria for highway and weaving segments, highway ramp junctions, local intersections, and peak commute hour vehicle speeds. The criteria used in this traffic analysis are consistent with the procedures contained in the Highway Capacity Manual (see **Figure 2.1-5**).

[2] The City of Pleasanton General Plan includes a number of traffic programs/thresholds in the Circulation Element that are intended to facilitate Policy 2, "Phase development and roadway improvements so that levels of service at adjacent major intersections do not exceed LOS D at major intersections outside Downtown and gateway intersections…"

Table 4-1 Year 2040 Intersection Peak Hour Level of Service Results

Location[1]		Control	Peak Hour	Year 2040 Conditions			
				No-Build		Build	
				Delay[2]	LOS	Delay[2]	LOS
1	**Foothill Rd / Dublin Canyon Rd**	**Signal**	**PM**	**47**	**D**	**48**	**D**
2	Owens Dr / Willow Rd	Signal	PM	16	B	16	B
3	Owens Dr / East BART Station Dwy	Signal	PM	10	B	10	B
4	Hacienda Dr / Owens Dr	Signal	PM	32	C	32	C
5	Santa Rita Rd / Rosewood Dr	Signal	PM	26	C	26	C
6	Santa Rita Rd / Pimlico Dr	Signal	PM	23	C	23	C
7	Foothill Rd / Stoneridge Dr	Signal	PM	21	C	21	C
8	**Stoneridge Dr / Springdale Ave**	**Signal**	**PM**	**30**	**C**	**31**	**C**
9	Stoneridge Dr / Stoneridge Mall Rd	Signal	PM	22	C	22	C
10	Stoneridge Dr / Johnson Dr	Signal	PM	14	B	14	B
11	Stoneridge Dr / Hopyard Rd	Signal	PM	29	C	29	C
12	Stoneridge Dr / Hacienda Dr	Signal	PM	20	C	20	C
13	Owens Dr / West Las Positas Blvd	Signal	PM	18	B	18	B
14	West Las Positas Blvd / Santa Rita Rd	Signal	PM	24	C	24	C
15	Foothill Rd / West Las Positas Blvd	Signal	PM	15	B	15	B
16	West Las Positas Blvd / Hopyard Rd	Signal	PM	29	C	29	C
17	West Las Positas Blvd / Hacienda Dr	Signal	PM	20	C	20	C
18	Stoneridge Dr / W. Las Positas Blvd	Signal	PM	34	C	34	C
19	Stoneridge Dr / Santa Rita Rd	Signal	PM	34	C	34	C
20	Santa Rita Rd / Mohr Ave	Signal	PM	16	B	16	B
21	Santa Rita Rd / Valley Ave	Signal	PM	42	D	42	D
22	Valley Ave / Busch Rd	Signal	PM	53	D	53	D
23	Bernal Ave / I-680 NB Ramps	Signal	PM	11	B	11	B
24	**Koll Center Dr / Bernal Ave**	**Signal**	**PM**	**31**	**C**	**33**	**C**
25	**Bernal Ave / Valley Ave**	**Signal**	**PM**	**40**	**D**	**41**	**D**

Location[1]		Control	Peak Hour	Year 2040 Conditions			
				No-Build		Build	
				Delay[2]	LOS	Delay[2]	LOS
26	Stanley Blvd / Santa Rita Rd	Signal	PM	16	B	16	B
27	Stanley Blvd / First Street	Signal	PM	14	B	14	B
28	**Stanley Blvd at Bernal Ave / Valley Ave**	**Signal**	**PM**	**41**	**D**	**45**	**D**
29	Bernal Ave / Vineyard Dr (N)	Signal	PM	12	B	12	B
30	Bernal Ave / Vineyard Dr (S)	Signal	PM	12	B	12	B
31	**Junipero Street / Sunol Blvd**	**Signal**	**PM**	**24**	**C**	**26**	**C**
32	Stoneridge Dr / El Charro Rd	Signal	PM	32	C	32	C
33	**Stanley Blvd / El Charro Rd**	**Signal**	**PM**	**32**	**C**	**34**	**C**
34	**Stoneridge Dr / I-680 NB Offramp**	**Signal**	**PM**	**10**	**A**	**11**	**B**
35	**Sunol Blvd / Bernal Ave**	**Signal**	**PM**	**53**	**D**	**60**	**E**
36	**Sunol Blvd / I-680 NB Ramps**	**Signal**	**PM**	**8**	**A**	**9**	**A**

Notes:
1. **Bold** indicates where additional project traffic causes an increase in average intersection control delay.
2. Signalized intersection level of service based on average intersection control delay (in seconds) according to the *Highway Capacity Manual* (Transportation Research Board, 2000). For side-street stop-controlled intersections, delay is reported as: intersection average (worst case approach).

Source: Fehr & Peers, 2013 (**Appendix L**)

Near-Term Impacts on Local Roads in Pleasanton

The traffic report prepared for the project contains projections of demand volumes for the year 2020; those projections indicate that the effect of the Build Alternative would be smaller in 2020 than in 2040 (i.e., the change in demand volume at the Sunol Boulevard off-ramp caused by the Build Alternative is smaller in 2020 than in 2040). In order to present a more conservative analysis, 2040 project-induced traffic changes were used and applied to the Pleasanton Existing Plus Approved Projects Synchro model, which reflects a more near-term horizon than the General Plan buildout scenario.

Table 4-2 shows the results of the intersection LOS analysis, with and without the Build Alternative, in the near-term horizon. As shown in the table, the largest magnitude of change caused by the Build Alternative is again at the Sunol Boulevard/Bernal Avenue intersection, where average delay increases by 6 seconds while the operation rating remains unchanged at LOS D. The magnitude of effects at the local intersections caused by the Build Alternative is smaller in the near-term (year 2020) than in the long-term (year 2040) scenario, and all of the study intersections operate at acceptable levels in both scenarios. None of the changes in delay are of a magnitude that would cause unacceptable LOS operations per Pleasanton General Plan policies.

Table 4-2 Near Term Intersection Peak Hour Level of Service Results

Location[1]		Control	Peak Hour	Year 2020 Conditions			
				No-Build		Build	
				Delay[2]	LOS	Delay[2]	LOS
1	**Foothill Rd / Dublin Canyon Rd**	**Signal**	**PM**	**51**	**D**	**53**	**D**
2	Owens Dr / Willow Rd	Signal	PM	16	B	16	B
3	Owens Dr / East BART Station Dwy	Signal	PM	9	A	9	A
4	Hacienda Dr / Owens Dr	Signal	PM	34	C	34	C
5	Santa Rita Rd / Rosewood Dr	Signal	PM	20	C	20	C
6	Santa Rita Rd / Pimlico Dr	Signal	PM	20	B	20	B
7	Foothill Rd / Stoneridge Dr	Signal	PM	21	C	21	C
8	Stoneridge Dr / Springdale Ave	Signal	PM	45	D	47	D
9	Stoneridge Dr / Stoneridge Mall Rd	Signal	PM	36	D	36	D
10	Stoneridge Dr / Johnson Dr	Signal	PM	13	B	13	B
11	Stoneridge Dr / Hopyard Rd	Signal	PM	33	C	33	C
12	Stoneridge Dr / Hacienda Dr	Signal	PM	21	C	21	C
13	Owens Dr / West Las Positas Blvd	Signal	PM	17	B	17	B
14	West Las Positas Blvd / Santa Rita Rd	Signal	PM	24	C	24	C
15	Foothill Rd / West Las Positas Blvd	Signal	PM	17	B	17	B
16	West Las Positas Blvd / Hopyard Rd	Signal	PM	31	C	31	C
17	West Las Positas Blvd / Hacienda Dr	Signal	PM	19	B	19	B
18	Stoneridge Dr / W. Las Positas Blvd	Signal	PM	35	D	35	D
19	Stoneridge Dr / Santa Rita Rd	Signal	PM	30	C	30	C
20	Santa Rita Rd / Mohr Ave	Signal	PM	17	B	17	B
21	Santa Rita Rd / Valley Ave	Signal	PM	40	D	40	D
22	Valley Ave / Busch Rd	Signal	PM	12	B	12	B
23	Bernal Ave / I-680 NB Ramps	Signal	PM	11	B	11	B
24	Koll Center Dr / Bernal Ave	Signal	PM	24	C	24	C
25	Bernal Ave / Valley Ave	Signal	PM	39	D	39	D

Location[1]		Control	Peak Hour	Year 2020 Conditions			
				No-Build		Build	
				Delay[2]	LOS	Delay[2]	LOS
26	Stanley Blvd / Santa Rita Rd	Signal	PM	18	B	18	B
27	Stanley Blvd / First Street	Signal	PM	9	A	9	A
28	**Stanley Blvd at Bernal Ave / Valley Ave**	**Signal**	**PM**	**36**	**D**	**39**	**D**
29	Bernal Ave / Vineyard Dr (N)	Signal	PM	11	B	11	B
30	Bernal Ave / Vineyard Dr (S)	Signal	PM	11	B	11	B
31	**Junipero Street / Sunol Blvd**	**Signal**	**PM**	**22**	**C**	**24**	**C**
32	Stoneridge Dr / El Charro Rd	Signal	PM	22	C	22	C
33	Stanley Blvd / El Charro Rd	Signal	PM	Does Not Exist			
34	Stoneridge Dr / I-680 NB Offramp	Signal	PM	10	A	10	A
35	**Sunol Blvd / Bernal Ave**	**Signal**	**PM**	**47**	**D**	**53**	**D**
36	Sunol Blvd / I-680 NB Ramps	Signal	PM	8	A	8	A

Notes:
1. **Bold** indicates where additional project traffic causes an increase in average intersection control delay.
2. Signalized intersection level of service based on average intersection control delay (in seconds) according to the *Highway Capacity Manual* (Transportation Research Board, 2000). For side-street stop-controlled intersections, delay is reported as: intersection average (worst case approach).

Source: Fehr & Peers and City of Pleasanton 2011; Fehr & Peers 2013

Benefits of the Build Alternative for Pleasanton Residents

It is important to consider the larger effects of the Build Alternative on the efficiency of travel along the I-680 corridor. This condition also affects Pleasanton residents, since many of them travel along northbound I-680 during the PM peak period as they return home from work.

Table 4-3 shows the estimated time for a single-occupant vehicle to travel along northbound I-680 from SR 237 to SR 84 in the year 2020. Under the 2020 No-Build condition, there is substantial queuing along I-680 from SR 237 to Washington Boulevard and from Vargas Road to Andrade Road; this queuing already exists today, and is projected to get worse between now and 2020. By the year 2020, it may take between 32 minutes and 46 minutes to travel between SR 237 and SR 84 during the typical late-afternoon commute period. With the additional freeway capacity constructed under the Build Alternative, queuing in this area is expected to be almost entirely alleviated. The result is that the same trip between SR 237 and SR 84 would take about 13 to 15 minutes, and the travel time would be fairly consistent throughout the peak commute period. This effect should be of substantial benefit to all of the regular travelers along I-680, some of whom are Pleasanton residents.

Evaluation of Project Effects on Air Quality Downstream of Project Study Limits

The Bay Area Quality Management District (BAAQMD) CEQA screening guidance indicates that projects would have a less-than-significant impact to carbon monoxide levels if the project traffic assessment predicts that traffic levels would not increase at any affected intersection to more than 44,000 vehicles per hour. The intersections that were evaluated within the City of Pleasanton, as previously described, have much lower traffic volumes (less than 10,000 vehicles per hour) and are well below the screening level of 44,000 vehicles per hour. Therefore, the proposed project would not cause or contribute to a violation of air quality standards through implementation of the Build Alternative.

Table 4-3 Estimated Travel Time (in minutes) From SR 237 to SR 84, Year 2020

Time Period	No-Build	Build Alternative
4:30 – 4:45 PM	31.7	13.2
4:45 – 5:00 PM	35.1	12.9
5:00 – 5:15 PM	39.0	13.5
5:15 – 5:30 PM	43.2	13.9
5:30 – 5:45 PM	46.8	14.6
5:45 – 6:00 PM	43.8	15.1
6:00 – 6:15 PM	41.9	14.8
6:15 – 6:30 PM	39.9	14.0

Source: Fehr & Peers 2013

Evaluation of Project Effects on Noise beyond the Project Limits

To evaluate the potential impacts associated with an increase in noise levels beyond the project limits, noise measurements were taken in the vicinity of I-680 and I-580 (see **Appendix L**). The results of the long- and short-term field measurements are summarized in **Tables 4-4** and **4-5**, respectively. From SR 84 to Koopman Road, the land use is unincorporated with no noise-sensitive receptors adjacent to I-680. Therefore, no noise levels were measured along this segment of the freeway. Long-term receptors and short-term receptors ST-1, ST-2, ST-3, and ST-4 were located along the mainline between Koopman Road and Sunol Boulevard.[3] Two short-term receptors (ST-5 and ST-6) were located between Sunol Boulevard and Bernal Avenue. The final two-term receptors (ST-7 and ST-8) were located along the I-680 corridor between Bernal Avenue and Stoneridge Drive.

[3] The freeway "mainline" refers to the general mixed-flow travel lanes.

The Build Alternative would not change either the horizontal or the vertical alignment of the freeway with respect to any noise sensitive receptors along I-680 in the City Pleasanton. There would be no increase in the number of lanes in this area. With no change to the roadway along this segment of I-680 through Pleasanton, only increased traffic could impact noise levels.

The noise increase north of the project limits was considered under peak conditions, adjusted to maintain free-flow traffic conditions along I-680. The noise levels increases in 2040 would be no more than 1.3 A-weighted decibels (dBA) under No-Build conditions. Under the Build Alternative conditions that include traffic in both the express lane and mixed-flow lanes, the noise increase in 2040 would be no more than 1.7 dBA. The relative increase in noise levels attributable to the Build Alternative would be 0.4 dBA or less, which not a detectable change with respect to human hearing. Permanent noise increases attributable to the Build Alternative north of the project limits would not be measurable or perceptible.[4]

Table 4-4 Summary of Long-Term Noise Measurements

Receptor ID	Location	Date	Time	Measured Worst Hour $L_{eq[h]}$, dBA
LT	In front of 8003 Rockford Place, Pleasanton	2/13/2013	5:00 PM	60
		2/14/2013	8:00 AM	66

Source: Illingworth & Rodkin, 2013

Table 4-5 Summary of Short-Term Noise Measurements

Receptor ID	Location	Date	Time	Measured Worst Hour $L_{eq[h]}$, dBA
ST-1	End of Koopman Road, Sunol	2/14/2013	10:30 AM	70
			10:40 AM	70
ST-2	Pleasanton-Sunol Road, South of Railroad Crossing, Pleasanton	2/14/2013	10:50 AM	67
			11:00 AM	65
ST-3	Backyard equiv. of 8019 Rockford Place, Pleasanton	2/14/2013	10:20 AM	58
			10:30 AM	58
ST-4	Adjacent to 1 Verona Road, Pleasanton	2/14/2013	1:20 PM	59
			1:30 PM	58
ST-5	Across from 5993 Sterling Greens Circle, Pleasanton	2/14/2013	9:50 AM	57
			10:00 AM	57

[4] See **Section 2.2.7, Noise**, for a complete discussion of the fundamentals of noise and how it's perceived.

Receptor ID	Location	Date	Time	Measured Worst Hour $L_{eq[h]}$, dBA
ST-6	Across from 7128 Moss Tree Way, Pleasanton	2/14/2013	9:50 AM	60
			10:00 AM	60
ST-7	Meadowlark Park, Pleasanton	2/14/2013	10:00 AM	57
			10:10 AM	57
ST-8	Muirwood Community Park, Pleasanton	2/14/2013	10:00 AM	63
			10:10 AM	63

Source: Illingworth & Rodkin, 2013

FARMLAND ACQUISITIONS

As discussed in **Section 2.1.4, Farmlands**, the Build Alternative would require the right-of-way acquisition of 1.28 acres of farmland. Of this, 0.04 acre is under Williamson Act contract. The Build Alternative would also require a utility easement of 0.03 acre of land that is under Williamson Act contract. Therefore, the project would require right-of-way acquisition and utility easement resulting in conversion of approximately 0.07 acre of land under a Williamson Act contract.

On October 30, 2014, letters were sent to the US Department of Agriculture (USDA) notifying it of the acquisition of 1.28 acres of farmland (**Appendix K**), and to the Department of Conservation notifying it of the 0.07 acre of conversion of land under a Williamson Act contract.

4.1.2 PROJECT DEVELOPMENT TEAM AND AGENCY CONSULTATION MEETINGS

PROJECT DEVELOPMENT TEAM

Regular Project Development Team (PDT) meetings provided the forum for coordination, issue resolution, and information feedback between Caltrans, Alameda CTC, Santa Clara Valley Transportation Authority (VTA), Cities of Milpitas, Fremont, Pleasanton, Livermore and Dublin, Alameda County Public Works Agency, and other affected agencies.

PDT meetings have occurred regularly since March 2012, and will continue to occur throughout the remainder of the environmental and project approval process. The PDT represents various fields of expertise, including design, environmental review, traffic operations, and project management. Accordingly, the PDT convenes to review the project status, address issues as they arise, and provide overall direction throughout the project development process.

Traffic studies were closely coordinated with VTA and the local cities to ensure consistency in regional planning efforts. Several workshops were held with the PDT to review the results of the traffic operations analysis, which are discussed in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**.

AGENCY CONSULTATION

In addition to the PDT meetings, there are several other public agencies involved in environmental clearance and permitting of the Build Alternative. These agencies include the U.S. Army Corps of Engineer (USACE), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), State Historic Preservation Officer (SHPO), and the Metropolitan Transportation Commission (MTC) Air Quality Conformity Task Force.

Caltrans initiates consultation with USFWS when a project has the potential to affect a federally listed species. As discussed in **Section 2.3, Biological Environment**, Caltrans has determined that the project is likely to adversely affect California tiger salamander, California red-legged frog, and Alameda whipsnake. Formal consultation with USFWS under the Federal Endangered Species Act will be initiated with the submission of a Biological Assessment (BA) prepared for the project. A Biological Opinion (BO) will be obtained from the USFWS prior to project approval.

Caltrans also initiates consultation with the NMFS when a project has the potential to affect a federally-listed anadromous fish species or adversely affect designated critical habitat. As the project has the potential to affect habitat for central California coast DPS steelhead, a federally-listed anadromous fish, consultation with the NMFS will be initiated with the submission of a BA prepared for the project. To date, no consultation, either formal or informal, has been initiated with NMFS for this project.

A Section 404 permit is necessary when a project will result in fill to waters of the U.S. under USACE jurisdiction. The Preliminary Determination of Jurisdictional Waters was sent by Caltrans to the USACE on August 6, 2013. A wetland verification site visit attended by USACE and Caltrans occurred on March 17, 2014. Official verification is pending. This project will result in permanent and temporary impacts to wetland and water features within the Caltrans right-of-way. Therefore, a Section 404 permit will be required for the proposed project.

A Section 401 Water Quality Certification is necessary when a project requires a Section 404 permit from the USACE. Because the proposed project will require a 404 permit, a 401 Water Quality Certification from the Central Coast RWQCB will also be required. Section 404 permitting will be initiated during the final design phase of the project.

A Section 1602 Lake or Streambed Alteration Agreement with CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. The Build Alternative would result in alterations to the bed and banks of Alameda Creek as result of creek diversion and pollution/siltation prevention systems to be installed during construction. Therefore, a Section 1602 permit would be required. This permit would be required for the completion of Phase 1 of the Build Alternative. No work resulting in the alteration of a stream or lake is anticipated within the future phases of the Build Alternative; a Section 1602 permit is not anticipated for construction of the future phases.

The Build Alternative has established an action plan for enforcement measures and standard conditions to protect known cultural resources within the project limits (see **Section 2.1.9, Cultural Resources**). The plan was filed with SHPO for concurrence. On January 13, 2014, SHPO issued a letter of concurrence for the *Finding of No Adverse Effect with Standard Conditions/Environmentally Sensitive Area and Archaeological Monitoring Area Action Plan* and the National Register of Historic Places (NRHP) eligibility determinations for the architectural resources under Section 106 of the National Historic Preservation Act.[5] No further consultation with SHPO is anticipated.

A qualitative particulate matter (PM) analysis is required under the United States Environmental Protection Agency (U.S. EPA) Transportation Conformity rule for projects of air quality concern (POAQC). On March 10, 2006, the U.S. EPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts. MTC's Air Quality Conformity Task Force met on October 25, 2012 as part of interagency consultation for the Build Alternative and took action to conclude that the Build Alternative was not a POAQC.

The proposed project is listed in the 2013 *Plan Bay Area* financially constrained Regional Transportation Plan (RTP) which was found to conform by MTC on July 18, 2013, and FHWA and FTA made a regional conformity determination finding on August 12, 2013. The project is also included in MTC's financially constrained 2013 Regional Transportation Improvement Program (RTIP), RTP Reference No. 22042 and TIP ID ALA130034.[6] The MTC 2013 RTIP was determined to conform by FHWA and FTA on August 12, 2013. The design concept and scope of the proposed project is consistent with the project description in the 2013 RTP, 2013 RTIP, and the open to traffic assumptions of the MTC's regional emissions analysis.

[5] The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800).

[6] MTC's 2013 RTIP originally listed the project under TIP ID No. ALA010014, and was revised to ALA130034 as part of Revision 2013-16 (dated May 26, 2014).

4.1.3 PUBLIC PARTICIPATION

NOTICE OF AVAILABILITY OF THE DRAFT ENVIRONMENTAL DOCUMENT

A Notice of Availability was circulated to the project mailing list and to the various parties listed on the distribution list (see **Chapter 6.0, Distribution List**). The notice provided information on the project including, a summary of the proposed improvements, where the environmental document can be reviewed, the address to where comments can be sent, and the close of the comment period.

PUBLIC MEETINGS

Information on this project will be presented at the following public meetings:

JANUARY 8, 2015 6:30-8:30 PM
Mission High School
41717 Palm Avenue
Fremont, CA 94539

JANUARY 13, 2015 6:30-8:30 PM
Hearst Elementary School
5301 Case Avenue
Pleasanton, CA 94566

The intent of the public meeting is to solicit comments and receive input from the public and agencies on the environmental analyses and conclusions presented in the draft Environmental Impact Report (EIR)/Environmental Assessment (EA) document. Comments will be taken into consideration for preparation of the final draft EIR/EA document.

4.1.4 NATIVE AMERICAN CONSULTATION

In December 2011 and February 2013 a file search was conducted by the Native American Heritage Commission (NAHC) to determine if there were known cultural sites within or near the Build Alternative's area of potential affect (APE). Following the records search, the NAHC stated that the file search showed no recorded resources within the APE.

The NAHC also provided a list of interested Native American groups and individuals in the project area and region. Letters requesting input from interested parties were sent to the Native American groups and individuals in January 2012 and February 2013.

Ms. Katherine Erolinda Perez (Ohlone/Costanoan, Northern Valley Yokuts; Bay Miwok) responded in 2012 and 2013. Her family historically used the area around Sunol and in Niles Canyon for gatherings. Her father's uncle traveled from Sunol Wilderness Park into the area around Newark gathering herbs for medicines. Ms. Perez noted that, if research indicates that such sites are present within the areas that would be disturbed by the proposed improvements, and if geoarchaeological trenching[7] is conducted for buried resources, she recommends both an archaeologist and a Native American monitor be present during such construction activities.

[7] Geoarchaeological trenching is the process and technique used to examine soil and sediments in earth layers for archaeological resources.

Mr. Edward Ketchum, Amah Mutsun Tribal Band, responded that the project area is outside of the Amah Mutsun traditional tribal boundaries. He offered the only information he had on the general area, "…that the Shaman would fly to the four corners of the world, one of which was the hills above Mission San Jose, and collect the 'eternal waters.' The 'eternal water' was used in a ceremony to bring the dead back to life."

Chairperson Ann Marie Sayers, Indian Canyon Mutsun Band of Costanoan asked for a summary of the records search findings and project impacts. She stated that if any area required archaeological attention like monitoring or excavation that a Native American monitor needed to be present.

Chairperson Rosemary Cambra, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area is aware of cultural resources throughout the project area and asked to be kept appraised of the project, Far Western's project recommendations, and whether monitoring or other archaeological work occurs.

As discussed in **Section 2.1.9, Cultural Resources**, ESA and AMA Plans were established to protect known cultural resources within the project area. A summary of the ESA and AMA Action Plan tasks are outlined under **Measure CUL-3**. Caltrans shall inform interested Native Americans about the proposed project activities and the ESA and AMA Action Plan prior to construction.

5.0 LIST OF PREPARERS

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Stewart D. Ng, Deputy Director, Programming & Projects

Dora Royster, Assistant to Steward Ng

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California Department of Transportation (Reviewers)

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Patrick Sutton, Environmental Scientist

Yane Nordhav, Geologist

Environmental Vision Consultants

Marsha Gale, Managing Principal

Chuck Cornwall, Principal

Far Western Consultants

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Dr. Brian Byrd, Principal Investigator

JRP Historical Consultants

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Han Bin Liang, PhD, President

Analette Ochoa, Senior Associate

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6.0 DISTRIBUTION LIST

This Draft Environmental Impact Report/Environmental Assessment (EIR/EA) was distributed to the following state and regional responsible and trustee agencies; and elected officials. Distribution of the Draft EIR/EA included hard copy, electronic media, reference to the web site in which the document is available, or a combination of these. Agency names marked with an asterisk (*) received copies through the State Clearinghouse.

In addition to the following list, over 250 local officials for the adjoining cities and counties along the project limits, stakeholders, community groups, businesses, and interested persons on the project mailing list were notified of the availability of this document and public meetings as described in **Chapter 4.0, Comments and Coordination**. Furthermore, all property owners/occupants within a 500-foot radius of the project limits received a project mailer informing them of the availability of the Draft EIR/EA.

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Red Bluff, CA 96080

National Marine Fisheries Services
Joe Heublein
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Santa Rosa, CA 95404

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