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# I-80 Express Lanes Project

SOLANO COUNTY, CALIFORNIA  
DISTRICT 04 – SOL – 80 – PM 10.4/30.2  
EA 04-4G080/PROJECT ID 0412000332

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



Prepared by the State of California Department of Transportation  
and Solano Transportation Authority

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.



November 2015

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## GENERAL INFORMATION ABOUT THIS DOCUMENT

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This is the Final Initial Study with Mitigated Negative Declaration (IS/MND)/Environmental Assessment with Finding of No Significant Impact (EA/FONSI) for the I-80 Express Lanes Project, located in Solano County, 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 was 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. The Draft IS/EA was circulated for comments between July 20 and August 18, 2015. A public open forum hearing was held on August 4, 2015 at the Solano County Events Center.

This Final IS/EA is an update of the Draft IS/EA. Changes made to the Draft IS/EA in response to comments are identified in the text with a vertical line in the margin. All comments received during the 30-day circulation period are included in **Chapter 3.0 Comments and Coordination**. Responses are provided following each comment. No text in the IS/EA was revised in response to the comments.

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Zachary Gifford, Associate Environmental Planner, 111 Grand Avenue, Office of Environmental Analysis MS-8B, Oakland, CA, 94612; (510) 286-5610; or use California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice) or 711.

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Construct an approximately 18-mile High Occupancy Vehicle/High Occupancy Toll (HOV/HOT or express lane) project on Interstate 80 (I-80) from west of Red Top Road to east of Interstate 505 (I-505), within Solano County.

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

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

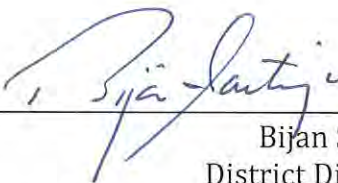
THE STATE OF CALIFORNIA  
Department of Transportation  
And  
Solano Transportation Authority

Cooperating Agencies: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Federal Highway Administration

Responsible Agencies: California Transportation Commission, North Coast Regional Water Quality Control Board, California Department of Fish and Wildlife, State Historic Preservation Office

12-1-15

Date of Approval

  
Bijan Sartipi  
District Director

Department of Transportation, District 4  
CEQA/NEPA Lead Agency

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CALIFORNIA DEPARTMENT OF TRANSPORTATION  
FINDING OF NO SIGNIFICANT IMPACT (FONSI)

FOR THE

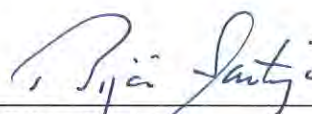
I-80 Express Lanes Project

The California Department of Transportation (Caltrans), in cooperation with Solano Transportation Authority (STA) and the Metropolitan Transportation Commission (MTC), has determined that the Build Alternative will have no significant impact on the human environment. This FONSI is based on the attached Environmental Assessment (EA) and other available reports appended to the EA, which have been independently evaluated by Caltrans and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. The EA provides sufficient evidence and analysis for determining that an Environmental Impact Statement is not required. Caltrans takes full responsibility for the accuracy, scope, and content of the attached EA and appended reports.

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.

12-1-15

Date



Bijan Sartip

District Director

Department of Transportation, District 4  
CEQA/NEPA Lead Agency

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## **Mitigated Negative Declaration**

Pursuant to: Division 13, Public Resources Code

### ***Project Description***

The California Department of Transportation (Caltrans), in cooperation with the Solano Transportation Authority (STA) and the Metropolitan Transportation Commission (MTC), proposes to provide High Occupancy Vehicle/High Occupancy Toll lanes (HOV/HOT or express lanes) in both the westbound and eastbound direction of Interstate 80 (I-80) from west of Red Top Road to east of Interstate 505 (I-505), within Solano County, California. The I-80 Express Lanes Project (project) would construct approximately 18 miles of express lanes in the I-80 corridor through conversion of existing HOV lanes and highway widening for new express lanes. The project limit is approximately 20 miles because of the need to install express lanes signs and equipment 1 mile in advance of the actual express lane entrance. The general location of the proposed improvements extends along I-80 from post mile (PM) 10.4 to 30.2 and passing through the cities of Fairfield and Vacaville.

### ***Determination***

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

The project would have no effect on land use, coastal zone, wild and scenic rivers, parks and recreational facilities, growth, community character, and energy.

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 relevant Avoidance, Minimization, and/or Mitigation Measures discussions within each section of **Chapter 2.0, Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures**). 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 significant impacts to the majority of resource topics (farmlands, community impacts, utilities/emergency services, traffic and transportation/pedestrian and bicycle facilities, visual/aesthetics, cultural resources, hydrology and floodplain, water quality and storm water runoff, geology/soils/seismic/topography, hazardous waste/materials, and air quality).


Significant impacts that would not be avoided and/or reduced through the implementation of the avoidance measures include potential significant impacts to paleontological resources; noise levels exceeding the noise abatement criteria thresholds; and the direct displacement of oak and riparian woodlands, jurisdictional water features, and habitats suitable for burrowing owl and California red-legged frog. Therefore, the following mitigation measures have been proposed:

**Mitigation Measure PALEONTOLOGY-A (PAL-A):** Monitoring and Mitigation Program

**Mitigation Measure NOISE-A (NOI-A):** Provide noise abatement

**Mitigation Measures BIOLOGY-A (BIO-A) through BIO-F:** Compensatory mitigation for potential impacts to oak woodland habitat, aquatic and wetland habitat, riparian woodland habitat, burrowing owl, and California red-legged frog

Implementation of Mitigation Measures PAL-A, NOI-A, and BIO-A through BIO-F, in combination with the avoidance and minimization measures, would reduce all significant impacts to a less than significant level.



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

12-1-15

Date



# SUMMARY

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## INTRODUCTION

The California Department of Transportation (Caltrans), in cooperation with the Solano Transportation Authority (STA) and the Metropolitan Transportation Commission (MTC), proposes to provide High Occupancy Vehicle/High Occupancy Toll lanes (HOV/HOT or express lanes) in both westbound and eastbound directions of Interstate 80 (I-80) from west of Red Top Road to east of Interstate 505 (I-505), within Solano County, California. The I-80 Express Lanes Project (project) would construct approximately 18 miles of express lanes in the I-80 corridor through conversion of existing HOV lanes and highway widening for new express lanes. The project limit is approximately 20 miles because of the need to install express lanes signs and equipment 1 mile in advance of the actual express lane entrance. The general location of the proposed improvements extends along I-80 from post mile (PM) R10.4 to 30.2 and passing through the cities of Fairfield and Vacaville (**Figure S-1**).

The project may be constructed under a single construction contract or in phases depending on available funding. If phasing occurs, the first phase of the project (West Segment) would include the conversion of the existing HOV lane to a new express lane facility along I-80 from the Red Top Road interchange to the Air Base Parkway interchange, including the area around the I-80/I-680 interchange. In the West Segment, existing HOV lanes in both the eastbound and westbound directions would be restriped and repurposed into express lanes. The second phase (East Segment) would construct a new express lane in both the eastbound and westbound directions of I-80 from the Air Base Parkway interchange through the I-80/I-505 interchange. **Figure S-1** illustrates the limits of the two segments.

I-80 Express Lanes Project is currently funded by the Bay Area Toll Authority (BATA) with Regional Measure 2 funds. In 2009, the West Segment Project was identified in MTC's Transportation 2035 Plan (RTP ID # 230660). In 2013, the East Segment Project was added to MTC's Plan Bay Area 2040 (RTP ID# 240581). Later in 2013, MTC updated the Transportation Improvement Program (TIP) to combine the West Segment and East Segment Project now known as "I-80 Express Lanes – Fairfield & Vacaville Phase I & II" with a new RTP ID# 240581 and TIP ID# SOL 110001 under TIP Amendment 2013-16.

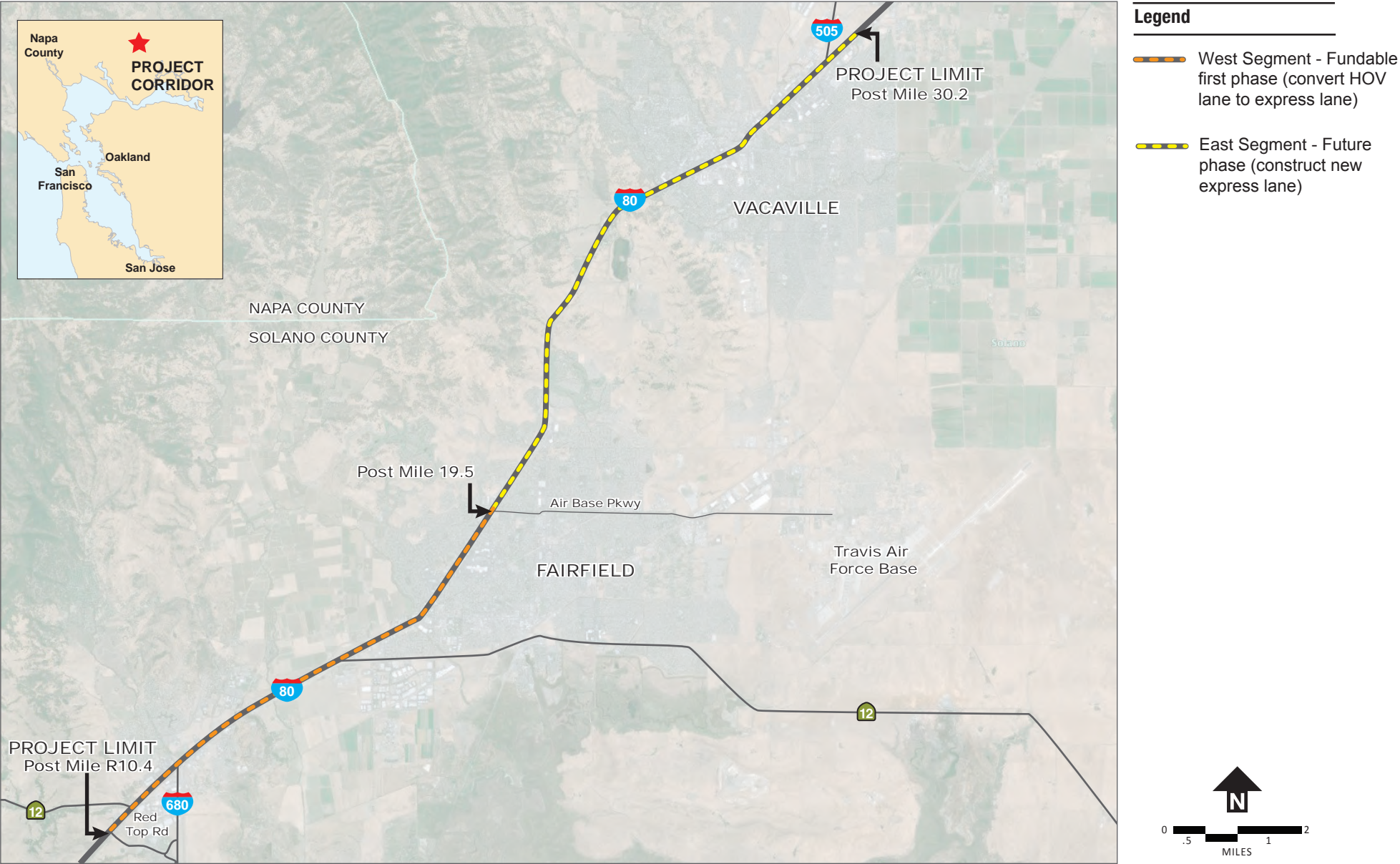
As part of the 2015 TIP update, MTC updated the I-80 Express Lanes Project to identify a full funding program of \$ 236.8 Million for the remaining project phases (Final Design, Right of Way and Construction) with Long Range Plan (LRP) funds (future RM2, STIP and others) and Other Local funds under TIP Amendment 2015-00.

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

## OVERVIEW OF THE PROJECT LIMITS

The proposed project is located within a region that varies from urban to rural development patterns, with a diverse mixture of land uses that are visibly and functionally divided through the cities of Vacaville, Fairfield, and unincorporated Solano County. I-80 runs west-east through the study limits and serves both local and regional traffic in the area.

In the West Segment, from the southern project limit to the SR 12/I-80 interchange, there is a mix of commercial, open space, industrial, agricultural, and residential land uses. From the SR 12/I-80 interchange traveling to the northern limit of the West Segment, land uses consist primarily of residential, with some commercial and open space. From the beginning of the East Segment, to the city limits of Fairfield, land uses consist primarily of residential, with some commercial and agricultural development. Continuing to travel north through unincorporated Solano County, to the southern limits of the City of Vacaville, land uses consist of agricultural, open space, and commercial development. Traveling north, through the City of Vacaville to the northern extent of the East Segment, land uses consist of residential, commercial with some open space, and education/public/semi-public development.



Project Location

Figure

Source: Circlepoint, 2015

## PROJECTS IN THE STUDY AREA

There are 70 planned developments within the land use study area (see **Table 2.1-1** in **Section 2.1.1, Land Use**). **Figures 2.4-1a and 2.4-1b** depict the locations of the other planned projects listed in **Table 2.1-1**. The predominant type of planned development in the study area is residential. Other development projects planned in the study area include several commercial and industrial land uses. The following planned and approved transportation improvements along local routes may be implemented by local agencies or under other projects:

- **The I-80/I-680/SR 12 Interchange Project, Initial Construction Package.** Realignment of westbound I-80 from east of the I-80/I-680 IC to SR 12 West connector, relocation of the Green Valley Road IC to the east and reconfiguration of the SR 12 West ramps and Green Valley Road on-ramp, occurring from 0.7 mile west on SR 12 West to SR 12 West/I-80 and on westbound I-80 from SR 12 West/I-80 to I-80/I-680.
- **Freeway Performance Initiative – I-80 Ramp Metering.** Installation of ramp metering equipment, traffic operating systems, metal beam guardrail, and sign structures, and widen ramp along I-80 in Solano County within the cities of Vallejo, Fairfield, and Vacaville from the Contra Costa County line to I-505.
- **Alamo Creek Bridge Widening Project.** Bridge widening and construction drainage on I-80 in Solano County, in and near the city of Vacaville.
- **Local Roadway Widening.** Local roadway widening at Peabody Road, Leisure Town Road, and Foxboro Parkway.
- **Roadway Extensions.** Roadway extensions at Railroad Avenue and Manuel Campos Parkway.
- **Capitol Corridor Station.** A new rail transit station is proposed at the Capitol Corridor Station.

## PURPOSE AND NEED

### PURPOSE

The purpose of the project is to provide an immediate benefit to the traveling public by maximizing the use of the existing freeway infrastructure and expanding capacity in a limited/constrained right-of-way (ROW) to move vehicles through the corridor efficiently. See **Section 1.3, Purpose and Need** for a more detailed description of the project need. The project would strive to meet the following objectives:

- Offer non-carpool eligible drivers a reliable travel time option;
- Improve public transit utilization by reducing public transit travel times in the corridor; and
- Increase vehicle and passenger throughput and decrease congestion by:
  - Better utilization of existing HOV lane capacity from Red Top Road to east of Air Base Parkway; and
  - Increasing capacity to meet existing and future travel demand from east of Air Base Parkway to I-505.

### NEED

- **Capacity and Travel Demand:** Congestion currently exists in the general purpose lanes during peak periods on the I-80 corridor in Solano County and will continue to worsen as traffic demand increases. During the weekday morning and evening peak commute hours, slowing occurs on both eastbound and westbound I-80.
- **Underutilized HOV Lanes:** The existing HOV lanes between Red Top Road and Air Base Parkway are underutilized during peak commute periods. During 2011, passenger occupancy counts were performed. Utilization in the existing HOV lanes ranged from 12 to 24 percent during the morning peak hours and 18 to 34 percent during the evening peak hours.<sup>1</sup> These numbers indicate an unused capacity in the HOV lane where the potential exists to “sell” the available capacity to toll-paying drive-alone users. This underutilized capacity in the HOV lanes results in increased congestion and slower speeds in the general purpose lanes during peak commute periods. Available unused capacity in the existing HOV lane system needs to be utilized to increase vehicle throughput and decrease congestion.
- **Future Conditions:** Projections of future conditions on the I-80 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-80 will increase by up to 35 percent by the year 2040. The forecasted conditions indicate a

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<sup>1</sup> Utilization was based on HOV lane capacity of 1,650 vehicles per hour per lane (vphpl), which is the typical acceptable flow rate for an HOV lane.

level of congestion that is also expected to cause substantial increases in the amount of diversion of through traffic onto local streets, degrade air quality, reduce public transit service reliability, and increase the potential for congestion-related collisions.

- **Public Transit Utilization.** Fairfield and Suisun Transit, Rio Vista Delta Breeze, Vallejo Transit and Yolo Bus operate public bus systems within the project limits. In addition, Fairfield and Suisun Transit operates Solano Express regional routes, Americans with Disabilities Act paratransit service and reduced fare taxi program. Additionally, private transit services, such as recreational buses to the Lake Tahoe region and the University of California Inter-campus Bus between Davis and Berkeley, must also travel in the general purpose lanes along the I-80 corridor between Fairfield and Vacaville. By having to travel in the general purpose lanes of the East Segment, transit vehicles do not provide a significant travel time savings over single-occupant vehicles in this portion of the corridor. This reduces the incentive for commuters and other travelers to utilize transit options along the I-80 corridor.

## 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”.

The Preliminary Study Report was prepared and approved for this project in 2012. Two build alternatives were considered:

- Alternative A would implement continuous access express lanes with minimal improvements to the existing facility; and
- Alternative B would implement 12-foot express lanes with ingress and egress access locations, 4-foot buffer, and improvements to the existing facility to meet current design standards. Improvements to meet current design standards included 36-foot paved median, concrete median barrier, correction for existing nonstandard sight distances, new auxiliary lanes, modification/relocation of 25 roadway and creek bridges, and the modification and construction of soundwalls and retaining walls.

Alternative B was determined to be not viable because it required significant impacts to over 100 urban and rural parcels including displacement of persons/businesses and major relocations of both high and low risks facilities. The project cost was estimated at \$1.4 billion in 2015 dollars which included \$990 million for construction capital, \$75 million for right of way capital and \$335 million for capital outlay support.

Alternative A was carried forward as the current Build Alternative evaluated in this environmental document, and was ultimately chosen as the Preferred Alternative.

Other express lane access configurations were also evaluated for the Build Alternative. These access alternative configurations are discussed in detail in **Section 1.4.3, Alternatives Considered but Eliminated from Further Discussion**.

## BUILD ALTERNATIVE

The Build Alternative proposes to construct express lanes in both westbound and eastbound directions of I-80 from west of Red Top Road to east of I-505, a distance of approximately 18 miles, through conversion of existing HOV lanes and highway widening for new express lanes. The project limit is approximately 20 miles because of the need to install express lanes signs and equipment 1 mile in advance of the actual express lane entrance. The Build Alternative would consist of the following primary improvements, discussed in detail in **Section 1.4.1, Alternatives**:

- Installation of static or dynamic signs, electronic tolling equipment, and toll collection
- Retrofit of existing California Highway Patrol (CHP) observation areas
- Mainline restriping and widening
- Installation of ancillary components such as electrical power and communication conduits and any Caltrans required traffic control devices.

### West Segment – Fundable First Phase

The Build Alternative may be constructed under a single construction contract or in phases depending on available funding. If phasing occurs, the first phase of the project (West Segment) would include the conversion of existing HOV lanes into new express lanes along I-80 from Red Top Road to Air Base Parkway, including the area around the I-80/I-680 interchange. In the West Segment, existing HOV lanes in both the eastbound and westbound directions would be restriped and repurposed into express lanes. For the West Segment, additional work includes the extension of the existing auxiliary lane along eastbound I-80 between Beck Avenue on-ramp and Travis Boulevard off-ramp. This improvement would increase the weaving area between the auxiliary lane and general purpose lanes. The existing off-ramp would be modified into two separate off-ramps. This work would require pavement widening, re-striping, sign and lighting installation, and drainage system improvements.

### East Segment – Future Phase

The future phase (East Segment) would construct new express lanes in both the eastbound and westbound directions of I-80, from the Air Base Parkway through the I-80/I-505 interchange. The new express lanes require new pavement; concrete barriers; retaining walls; bridge widening at Ulatis and Horse Creeks; median widening at Davis Street and Mason Street undercrossings; new tie-back retaining walls at the eastbound I-80 and northbound I-505 Connector and Cherry Glen overcrossing; drainage culvert extensions; parcel acquisition; and utility/temporary construction easements.

**Appendix D** includes detailed exhibits of the improvements that would be constructed under the Build Alternative. **Chapter 2.0, Affected Environmental Consequences, 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. The environmental consequences and avoidance, minimization and/or mitigation measures specific to the West Segment are identified where appropriate.

## CONSTRUCTION COST

The estimated construction cost of the proposed improvements, in 2014 dollars, for the Build Alternative is \$166,600,000. Construction of the West Segment is \$41,700,000. The breakdown of the cost is provided in **Table S-1**.

**Table S-1 Construction Cost Estimate Summary**

	Full Build Alternative (West and East Segments)	West Segment (Fundable First Phase)
Construction	\$107,500,000	\$24,700,000
Right of Way	\$1,500,000	\$100,000
Tolling System Integration (design, installation, and maintenance)	\$21,100,000	\$9,100,000
Capital Outlay Support	\$35,000,000	\$7,200,000
Utility Service	\$1,500,000	\$600,000
<b>Total Cost</b>	<b>\$166,600,000</b>	<b>\$41,700,000</b>

Note: Cost estimates are in 2014 dollars.  
Source: Draft Project Report, 2015

## 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-80 corridor would remain as they currently exist. No bridge structures would be widened. Traffic volumes within the project corridor would continue to increase under the No-Build Alternative. Other planned and approved transportation improvements along local routes may be implemented by local agencies or under other projects. **Table S-2** lists the projects assumed to be completed prior to construction of the project. The No-Build includes the potential for these improvements to be implemented through design year 2040. The No-Build Alternative is considered the environmental baseline for comparing environmental impacts under the National Environmental Policy Act (NEPA).<sup>2</sup>

<sup>2</sup> 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) is issued or at the time the environmental studies began. Near-term (2020) and long-term (2040) impacts are also considered under CEQA; similar to the No-Build baseline used for NEPA.



The No-Build Alternative would not achieve the project purpose of increasing the efficiency of the transportation system by adding express lanes on eastbound and westbound I-80 between Red Top Road and I-505 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.

**Table S-2      Planned Improvements to be Completed Prior to Project Construction**

<b>Project Name (EA No.)</b>	<b>Project Limits and Description</b>	<b>Status</b>
I-80/I-680/SR 12 Interchange Project  Phase 1, Initial Construction Package  (EA 04-0A5344)	<p><b>Limits:</b> From 0.7 mile west on SR 12 West to SR 12 West/I-80 and on westbound I-80 from SR 12 West/I-80 to I-80/I-680.</p> <p><b>Description:</b> Realignment of westbound I-80 from east of the I-80/I-680 IC to SR 12 West connector, relocation of the Green Valley Road IC to the east and reconfiguration of the SR 12 West ramps and Green Valley Road on-ramp. The westbound I-80 realignment to the north will provide for a wider median to accommodate the future I-680/I-80 HOV Lanes Connector (Package 6 of the I-80/I-680/SR 12 IC Project) and correct the nonstandard typical section on westbound I-80 between the relocated Green Valley Road IC and the SR 12 West.</p>	Anticipated Construction Completion 2016
I-80 Ramp Metering  (EA 04-153504)	<p><b>Limits:</b> Along I-80 in Solano County, within the cities of Vallejo, Fairfield and Vacaville; from the Contra Costa County Line to I-505.</p> <p><b>Description:</b> Install ramp metering, traffic operating systems, metal beam guardrail, and sign structures, and widen ramp</p>	Completed 2014
Bridge Widening  (EA 04-0A0904)	<p><b>Limits:</b> On I-80 in Solano County, in and near Vacaville from 0.2 mile west of Alamo Creek Bridge to 0.2 mile east of Alamo Creek Bridge.</p> <p><b>Description:</b> Widen bridge and construction drainage</p>	Completed 2014

The largest planned improvement project within the project limits is the I-80/I-680/SR 12 Interchange (ICP) – Phase 1 Project, which will be constructed with seven individual construction packages. The project report for the preferred alternative and the corresponding Phase 1, Initial Construction Package for the ICP was approved in October 2012. The Phase 1 of the ICP will include numerous improvements to address existing and future traffic operations and congestion, including relocation of the Cordelia Westbound Truck Inspection Facility. Proposed improvements are intended to add freeway capacity, reduce cut through traffic on local roads, improve local access to and from the freeway, accommodate current and future truck volumes, improve safety and increase the use of HOV lanes and ridesharing. The existing highway geometry on I-80, within the limits of the West Segment, has been adjusted in the design of this I-80 Express Lanes Project to include proposed improvements from Phase 1 of the ICP.

## JOINT CEQA/NEPA DOCUMENT

The proposed project is a joint project by the 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. The joint document prepared for this project is an IS/EA.

Following receipt of comments from the public reviewing agencies, this IS/EA was prepared. This IS/EA includes responses to comments received on the draft IS/EA and identifies the preferred alternative. Two comments on the project were received during the public review period and are included this IS/EA in **Chapter 3.0 Comments and Coordination**.

Caltrans has determined that the IS/EA adequately and accurately discusses the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. If the 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-3** 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 (West Segment). Where appropriate, the environmental consequences and avoidance, minimization and/or mitigation measures specific to the West 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-3 Project Impacts**

Environmental Topic	No-Build Alternative	Build Alternative (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
<b>Land Use</b>				
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
<b>Parks and Recreation Facilities</b>				
No Effect				
<b>Growth</b>				
Growth-inducing	No	Indirectly, but within planned and forecasted growth	Same as Build Alternative	None
<b>Farmlands</b>				
Farmland acquisition	None expected	Low (0.01 acres of Unique Farmland)	Same as Build Alternative	None
Williamson Act Property Acquisition	None expected	Low (0.01 acres of land under a Williamson Act contract)	Same as Build Alternative	<b>Measure FRM-1:</b> 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 (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
<b>Community Impacts</b>				
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 27 parcels	No relocations; Acquisition of portions (or slivers) of 10 parcels	<b>Measure TRA-1:</b> 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
<b>Utilities/Emergency Services</b>				
Utilities	None expected	Some relocations of existing gas and electric transmission lines	Same as Build Alternative	<b>Measure UTL-1:</b> 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	<b>Measure TRA-1:</b> Implement TMP with notifications of delays and/or detours during construction
<b>Traffic and Transportation/Pedestrian and Bicycle Facilities</b>				
Conflict with applicable plans, ordinances, policies, or programs	Yes	None	None	None
Increase traffic congestion	Yes	Will reduce traffic congestion	Same as Build Alternative	<b>Measure TRA-1:</b> Implement TMP with notifications of delays and/or detours during construction
Increase hazards as a result of a design feature	None expected	None	None	None
<b>Visual/Aesthetics</b>				
Adverse effect on scenic	None expected	None	None	None

Environmental Topic	No-Build Alternative	Build Alternative (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
views/damage scenic resources				
Degradation of existing visual character or quality	None expected	Potential visual quality lost	Same as Build Alternative	<b>Measures VIS-1 through VIS-5:</b> 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	<b>Measure VIS-6:</b> Lighting would adhere to Caltrans Standard Specifications Implement construction light and glare screening measures
<b>Cultural Resources</b>				
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	None expected	<b>Measure CUL-1:</b> If unidentified cultural materials are unearthed during construction work shall be halted in that area. <b>Measure CUL-3:</b> An ESA Action Plan has been prepared to specify avoidance areas and areas requiring monitoring during construction to avoid all impacts to known archaeological resources in the East Segment <b>Measure CUL-4:</b> A Testing/Treatment Plan will be implemented to avoid impacts to potential archaeological resources in the East Segment.

Environmental Topic	No-Build Alternative	Build Alternative (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
Disturbance to human remains	None expected	None expected	Same as Build Alternative	<b>Measure CUL-2:</b> 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)
<b>Hydrology and Floodplain</b>				
Within a 100-year floodplain	Yes	Yes	Yes	<b>Measure HYDR-1:</b> 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 and no changes in the 100-year water surface elevations	Similar to Build Alternative; minimal increases in storm water runoff and no changes in the 100-year water surface elevations	None
<b>Water Quality and Storm Water Runoff</b>				
Result in substantial drainage pattern alteration	None expected	Modification/removal of existing drainage structures	Same as Build Alternative	<b>Measure WQ-1:</b> 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	<b>Measure WQ-1:</b> Implement Storm Water Pollution Prevention Plan
Change to groundwater supply or groundwater recharge	None expected	None Expected	Same as Build Alternative	None

Environmental Topic	No-Build Alternative	Build Alternative (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
Substantially degrade water quality	None expected	Potential minor construction and operational effects	Same as Build Alternative	<b>Measure WQ-2 and WQ-3:</b> Implement Design Pollution Prevention and Treatment Best Management Practices
<b>Geology/Soils/Seismic/Topography</b>				
Expected likelihood of seismic related issues, including ground shaking and liquefaction	High potential for ground shaking, liquefaction potential varies	Same as No-Build Alternative	Same as No-Build Alternative	<b>Measure GEO-1:</b> 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	<b>Measure GEO-2:</b> Comply with Occupational Safety and Health Act Section 5(a)(1)
Mineral Resources	None expected	None expected	None expected	None
<b>Paleontology</b>				
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	<b>Mitigation Measure PAL-A:</b> Preparation and implementation of a Caltrans-approved paleontological monitoring and mitigation program.
<b>Hazardous Waste/Materials</b>				
Create a hazard to the environment	None expected	None expected, but potential due to excavation and construction activities	Same as Build Alternative	<b>Measures HAZ-1 through HAZ-5:</b> 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 (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
Create a hazard to the public	None expected	None expected	Same as Build Alternative	<b>Measures HAZ-1 through HAZ-5:</b> 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	<b>Measures HAZ-1 through HAZ-5:</b> 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
<b>Air Quality</b>				
Operational Emissions	Greater than Build Alternative	Regional and project-level conformity achieved, No considerable net increase of any criteria pollutant	Same as Build Alternative	None



Environmental Topic	No-Build Alternative	Build Alternative (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
Emissions from construction equipment	Unknown	Temporary increases in daily maximum construction emissions	Same as Build Alternative	<b>Measures AIR-1 through AIR-3:</b> Implement Caltrans Standard Specifications and control measures for construction emissions
<b>Noise</b>				
A substantial increase in permanent noise levels	None expected	Potential permanent noise level increases ranging from 0 to 2 dBA (varies throughout project limits)	Same as Build Alternative	<b>Mitigation Measure NOI-A:</b> Potential noise abatement measures
A substantial increase in temporary noise levels	None	Potential due to construction activities	Same as Build Alternative	<b>Measure NOI-1:</b> Compliance with Caltrans Standard Specifications for construction equipment; restricted construction hours
<b>Energy</b>				
No Effect				
<b>Biological Resources</b>				
Effects to habitat or sensitive natural communities	None	Potential effects to oak woodland habitat (1.35 acres) during and post construction activities	Same as Build Alternative	<b>Mitigation Measures BIO-A and BIO-B:</b> Compensatory mitigation for oak woodlands and Oak Woodland Habitat Mitigation & Monitoring Plan

Environmental Topic	No-Build Alternative	Build Alternative (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
Effects to wetlands and other waters	None	Potential impacts (1.41 acres) and indirect water quality effects to wetlands and other waters.	Potential impacts (0.33 acres) and indirect water quality effects to wetlands and other waters.	<p><b>Measures WQ-1 through WQ-3:</b> Temporary and permanent best management practices to protect water quality</p> <p><b>Mitigation Measure BIO-C:</b> Compensatory Mitigation for Jurisdictional Water Features</p>
Effects to sensitive or special status species	None	Direct impacts to habitat types with the potential to support chinook salmon, Western burrowing owl, Western pond turtle, American badger, dusky-footed woodrat, migratory birds, and bat species	Similar to Build Alternative	<p><b>Measures WQ-1 through WQ-3:</b> See above</p> <p><b>Measures BIO-1 through BIO-32 and BIO-E:</b> Fencing environmental sensitive areas (ESAs), work restriction in aquatic habitat, worker awareness training, cease work orders in the event of special-status species presence, pre-construction surveys for special-status species, seasonal work restrictions, prohibiting the use of insecticides, herbicides, fertilizers, or other chemicals near special-status plants, dust control measures, qualified biological monitors, complying with the Executive Order on Invasive Species (EO 13112), complying with Biological Opinion, compensatory mitigation for burrowing owl.</p>

Environmental Topic	No-Build Alternative	Build Alternative (West and East Segments)	West Segment (Phase 1)	Avoidance, Minimization, and/or Mitigation Measures
Effects to threatened and endangered species	None	Potential effects to the Valley elderberry longhorn beetle, California red-legged frog, Swainson's hawk	Similar to Build Alternative	<p><b>Measures WQ-1 through WQ-3:</b> See above</p> <p><b>Measures BIO-1 through BIO-32:</b> See above</p> <p><b>Measures BIO-1 through BIO-3 and BIO-29:</b> Fencing environmental sensitive areas (ESAs), work restriction in aquatic habitat, worker awareness training, pre-construction nesting surveys</p> <p><b>Mitigation Measure BIO-F:</b> Compensatory mitigation for impacts to California red-legged frog</p>

## COORDINATION WITH PUBLIC AND OTHER AGENCIES

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 for the proposed project has been accomplished through a variety of formal and informal methods, including Project Development Team (PDT) meetings and interagency coordination meetings. **Chapter 3.0, Comments and Coordination**, summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

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), California Department of Fish and Wildlife (CDFW), Regional Water Quality Control Board (RWQCB), State Water Resources Control Board (SWRCB), State Historic Preservation Officer (SHPO), and the Metropolitan Transportation Commission (MTC) Air Quality Conformity Task Force/Federal Highway Administration (FHWA). See **Section 3.1.1, Consultation and Coordination with Public Agencies**, for a complete discussion of the agency consultation efforts completed and/or planned for the Build Alternative.

Additionally, a public open forum hearing was held from 6:00 pm to 8:00 pm on August 4, 2015 during the 30-day review period of the draft IS/EA. The intent of the public hearing was to solicit comments and receive input from the public and agencies on the environmental analyses and conclusions presented in the draft IS/EA, including the noise study report. The public open forum hearing was held in Conference Room B of the Solano County Events Center at 601 Texas Street, Fairfield, California. The hearing utilized an open forum format, and six members of the public attended. One comment was submitted in writing during the hearing. Comments were taken into consideration during preparation of this final IS/EA document. Public participation is further described in **Chapter 3.0 Comments and Coordination**.

## NECESSARY PERMITS AND APPROVALS

**Table S-4** identifies the permits/approvals that would be required for project construction.

**Table S-4 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 (USFWS)	Biological Opinion/ Concurrence with “no effect” determination	Biological Opinion issued August 17, 2015

Agency	Permit/Approval	Status
National Marine Fisheries Service (NMFS)	Concurrence with “no effect” determination	Concurred that project is covered under Category 3 of the Programmatic Biological Opinion on May 26, 2015
California Department of Fish and Game	1602 Agreement	Issued during the Final Design Phase
State Water Resources Control Board	NPDES Permit	Statewide general permit adopted September 19, 2012; effective July 1, 2013
Regional Water Quality Control Board	Section 401 Certification	Issued during the Final Design Phase
Metropolitan Transportation Commission (MTC) Air Quality Conformity Task Force/ Federal Highway Administration (FHWA)	Regional Air Quality Conformity	MTC Determination September 24, 2014 FHWA Determination August 12, 2013
	Project-Level Air Quality Conformity	MTC Determination September 25, 2012/ FHWA Determination September 22, 2015
State Historic Preservation Officer (SHPO)	Concurrence on Eligibility Determinations/Finding of No Adverse Effect with Standard Conditions – Environmentally Sensitive Area (ESA)	Concurrence Requested January, 2015 Concurrence Received July 2, 2015

Source: Circlepoint, 2014

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## LIST OF ACRONYMS

AADT	average annual daily traffic
AB 32	Assembly Bill 32
AB 1493	Assembly Bill 1493
ABAG	Association of Bay Area Governments
ACM	asbestos containing material
ADA	Americans with Disabilities Act
ADL	aerially deposited lead
ADT	average daily trips
APCD	Air Pollution Control District
APE	area of potential effect
APN	assessor parcel number
ARB	California Air Resources Board
ARS	acceleration response spectrum
ASR	Archaeological Survey Report
BAAQMD	Bay Area Air Quality Management District
BMPs	Best Management Practices
BSA	biological study area
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CCR	California Code of Regulations
CCTV	closed circuit television
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Compensation and Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH <sub>4</sub>	methane
CHP	California Highway Patrol
CIA	Community Impact Assessment
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRHR	California Registry of Historical Resources
CRLF	California red-legged frog
CWA	Clean Water Act
CO	carbon monoxide

CO <sub>2</sub>	carbon dioxide
CO-CAT	Costal Ocean Climate Action Team
CSA	construction staging area
CTC	California Transportation Commission
CTP	Solano Comprehensive Transportation Plan
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DBH	diameter at breast height
DI	De-Ionized
DMV	Department of Motor Vehicles
DPR	draft project report
DPS	distinct population segment
DSA	Disturbed Soil Area
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EOS	Edge of Shoulder
ESA	environmentally sensitive area
ESL	Environmental Screening Limits
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	Farmland Mapping and Monitoring Program
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FSTIP	Federal Statewide Transportation Improvement Program
FTA	Federal Transit Administration
FY	fiscal year
GHGs	greenhouse gases
H <sub>2</sub> S	Hydrogen Sulfide
HCP	Habitat Conservation Plan
HFC-134a	s, s, s, 2 –tetrafluoroethane
HFC-152a	difluoroethane
HFCs	hydrofluorocarbons
HFC-23	fluoroform
HMMP	Habitat Mitigation and Monitoring Plan
HOT	High Occupancy Toll
HOV	high occupancy vehicle



HPSR	Historic Property Survey Report
HRER	Historic Resources Evaluation Report
I-80	Interstate 80
I-505	Interstate 505
I-680	Interstate 680
ICP	I-80/I-680/SR 12 Interchange Project
IGR	Intergovernmental Review
IPCC	Intergovernmental Panel on Climate Change
IS	Initial Study
ISA	Initial site assessment
ITS	Intelligent Transportation System
Leq	The average A-weighted noise level during the measurement period
L <sub>max</sub>	The maximum A-weighted noise level during the measurement period
LEDPA	least environmentally damaging practicable alternative
LOS	Levels of Service
LPR	license plate recognition
LT	long-term
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
Mmax	Maximum Credible Earthquake Magnitude
MLD	Most Likely Descendent
MMI	Modified Mercalli Intensity Scale
MOE	measure of effectiveness
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MPP	Mitigation Monitoring Plan
MRZ	Mineral resource zone
MS4s	Municipal Separate Storm Sewer Systems
MSAT	Mobile Source Air Toxics
MSL	mean sea level
MTC	Metropolitan Transportation Commission
MVDS	magnetometer vehicle detector station
MVP	maintenance vehicles pullout
N2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NADR	Noise Abatement Decision Report
NAHC	Native American Historic Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act

NHTSA	National Highway Traffic Safety Administration
NO <sub>x</sub>	nitrogen oxides
NO <sub>2</sub>	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic Atmospheric Administration
NOAA Fisheries	National Marine Fisheries Service
NOD	Notice of Determination
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NMFS	National Marine Fisheries Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
O <sub>3</sub>	ozone
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Act
OSPA	open space planning area
OSR	open space recreation
OSTP	Office of Science and Technology Policy
PA	Programmatic Agreement
Pb	lead
PER	Paleontological Evaluation Report
PDT	Project Development Team
PF	public facility
PFCs	perfluorocarbons
PGA	peak ground acceleration
PG&E	Pacific Gas & Electric
PGR	Preliminary Geologic Report
PID	Project Initiation Document
PIR	Paleontological Identification Report
PM	particulate matter
PM	post mile
PMP	Paleontological Mitigation Plan
PMR	Paleontological Mitigation Report
POAQC	projects of air quality concern
PQS	Professionally Qualified Staff
PRC	Public Resources Code
PSR	project study report
PSS	Paleontological Stewardship Summary
PTZ	pan tilt zoom
R	receptors
RAP	Relocation Assistance Program
Resources Agency	California Natural Resources Agency

ROG	reactive organic gases
ROW	right-of-way
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
RWQCB GT	Regional Water Quality Control Board Geotracker
RCRA	Resource Conservation and Recovery Act of 1976
SCS	Sustainable Communities Strategy
SDC	Seismic Design Criteria
SF <sub>6</sub>	sulfur hexafluoride
SHPO	State Historic Preservation Office
SID	Solano Irrigation District
SIP	State Implementation Plan
SMP	Soil Management Plan
SO <sub>2</sub>	sulfur dioxide
So <sub>x</sub>	sulfur oxides
SR	state route
ST	short-term
STA	Solano Transportation Authority
STLC	Solubility Threshold Concentration Limit
SVOCs	semi-volatile organic compounds
SWDR	Storm Water Data Report
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TASAS	Traffic Accident Surveillance and Analysis Systems
TCE	temporary construction easement
TDM	Transportation Demand Management
TIP	Transportation Improvement Plan
TMDL	Total Maximum Daily Loads
TMP	Traffic Management Plan
TOAR	Traffic Operation Analysis Report
TOPD	Traffic Operations Policy Directive
TOS	traffic operating system
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSM	Transportation Management System
TTLC	Total Threshold Limit Concentrations
U.S.	United States
USC	United States Code
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency

USACE	Unites States Army Corps of Engineers
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	Unites States Geological Survey
UST	Underground Storage Tank
VMT	vehicle miles traveled
VOCs	volatile organic compounds
VTMS	variable toll message sign
WDRs	Waste Discharge Requirements
WEAT	Worker environmental awareness training
WET	Waste Extraction Testing
WPCP	Water Pollution Control Plan
WWTP	wastewater treatment plant
YSAQMD	Yolo-Solano Air Quality Management District

## 1.0 PROPOSED PROJECT

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### 1.1 INTRODUCTION

The California Department of Transportation (Caltrans), in cooperation with the Solano Transportation Authority (STA) and the Metropolitan Transportation Commission (MTC), propose to provide High Occupancy Vehicle/High Occupancy Toll lanes (HOV/ express lanes) in both the westbound and eastbound direction of Interstate 80 (I-80) from west of Red Top Road to east of Interstate 505 (I-505), within Solano County, California. The I-80 Express Lanes Project (project) would construct approximately 18 miles of express lanes in the I-80 corridor through conversion of existing HOV lanes and highway widening for new express lanes. The project limit is approximately 20 miles because of the need to install express lanes signs and equipment 1 mile in advance of the actual express lane entrance. **Figure 1-1** shows the general location of the proposed improvements extending along I-80 from post mile (PM) R10.4 to 30.2 and passing through the cities of Fairfield and Vacaville.

The project may be constructed under a single construction contract or in phases depending on available funding. If phasing occurs, the first phase of the project (West Segment) would include the conversion of the existing HOV lane to a new express lane facility along I-80 from the Red Top Road interchange to the Air Base Parkway interchange, including the area around the I-80/I-680 interchange. In the West Segment, existing HOV lanes in both the eastbound and westbound direction would be restriped and repurposed into express lanes. The second phase (East Segment) would construct a new express lane in both the eastbound and westbound directions of I-80 from the Air Base Parkway interchange through the I-80/I-505 interchange. **Figure 1-1** illustrates the limits of the two segments, and **Appendix D** shows the complete layout of both segments of the projects, including proposed improvements.

I-80 is a regional east-west corridor that connects San Francisco and Sacramento, passing through the counties of Contra Costa, Solano, and Yolo. I-80 is heavily-traveled by commuters living in Solano County, traffic to and from Sacramento, recreational travelers on weekends, and interstate travel including the movement of freight and goods.

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).

### 1.2 STATE/REGIONAL/LOCAL PLANNING

In early 2006, 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.

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-80 as a priority corridor and includes the West Segment portion of the project as part of the larger MTC Phase 1 Project.

The project is consistent with the MTC Transportation 2035 Plan for the San Francisco Bay Area, and is an element of MTC's 533-mile "backbone" network for express lanes in the San Francisco Bay Area, as described in MTC's Express Lane Backbone Network PSR (RTP ID 240581 and 230660).

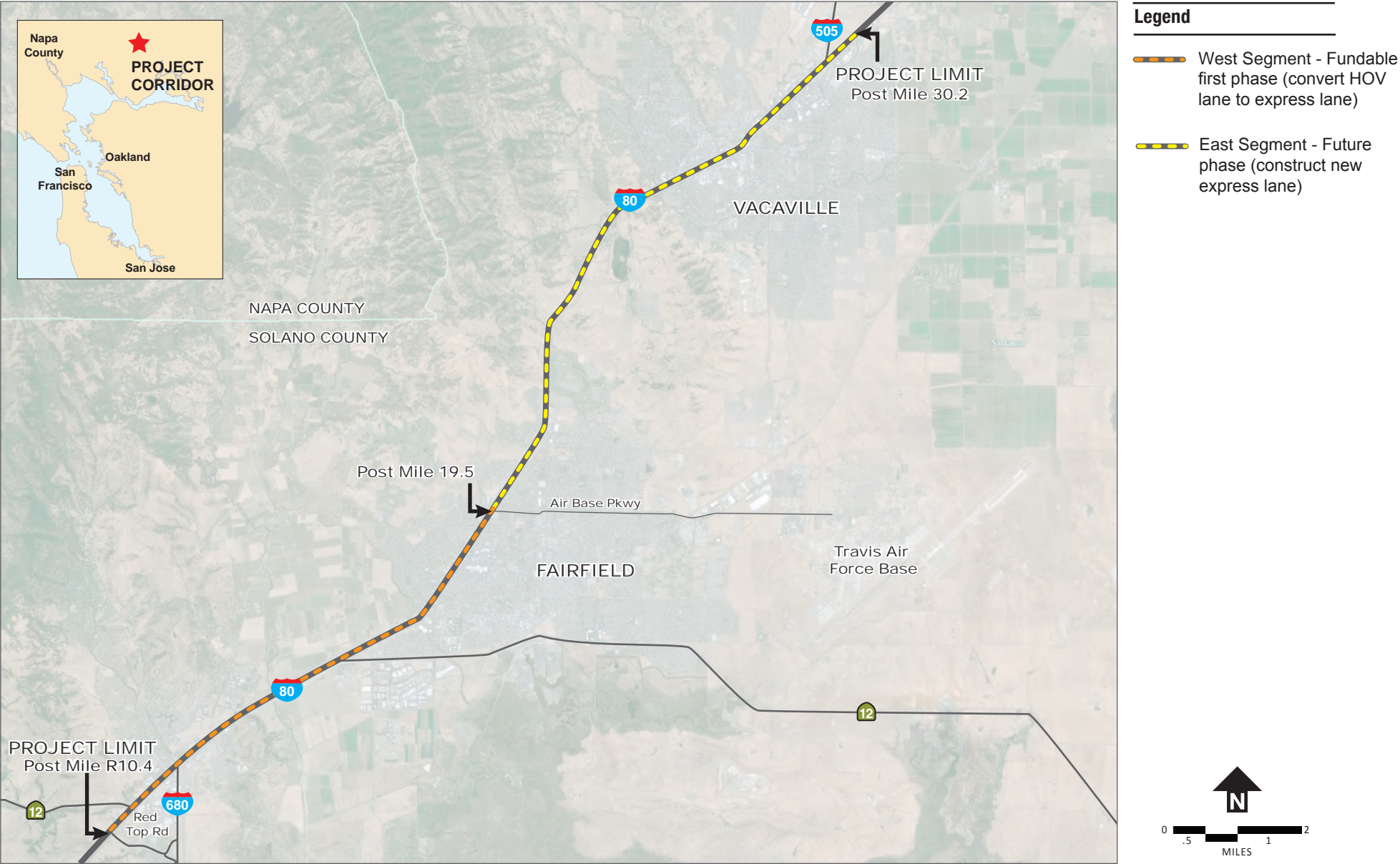
The project is included in the MTC's 2013 Transportation Improvement Program (TIP) as project number SOL110001.<sup>1</sup> MTC approved the financially constrained TIP through Amendment No. 2013-16 on May 28, 2014. The Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) approved and incorporated the TIP in to the Federal Statewide Transportation Improvement Program (FSTIP) on June 12, 2014.

## **1.3 PURPOSE AND NEED**

### **1.3.1 PURPOSE**

The purpose of the project is to provide an immediate benefit to the traveling public by maximizing the use of the existing freeway infrastructure and expanding capacity in a limited/constrained right-of-way (ROW) to move vehicles through the corridor efficiently. The project would strive to meet the following objectives:

- Offer non-carpool eligible drivers a reliable travel time option;
- Improve public transit utilization by reducing public transit travel times in the corridor; and
- Increase vehicle and passenger throughput and decrease congestion through:
  - Better utilization of existing HOV lane capacity from Red Top Road to east of Air Base Parkway; and
  - Increasing capacity to meet existing and future travel demand from east of Air Base Parkway to I-505.



Project Location

Figure 1-1

Source: Circlepoint, 2015

### 1.3.2 NEED

There are a number of existing deficiencies on I-80 that hinder the efficient movement of traffic. These deficiencies form the basis for the need for the project and are categorized below.

#### CAPACITY AND TRANSPORTATION DEMAND

##### **Existing Capacity**

During the weekday morning and evening peak commute hours, slowing occurs on both eastbound and westbound I-80. Factors that contribute to the slowing of I-80 traffic between the I-680 Interchange and the State Route 12 (SR 12) East (to Rio Vista) Interchange include closely spaced ramps, high vehicular volumes merging and diverging from the general purpose travel lanes, and truck movements to and from the Cordelia Truck Scales. Factors that contribute to slowing of traffic between Travis Boulevard and Lagoon Valley Road/Cherry Glen Road include high traffic volumes associated with popular destinations such as Travis Air Force Base and retail areas within the Solano Mall; and the curvature and roadway grades near Lagoon Valley Road/Cherry Glen Road. The slowing of westbound I-80 traffic between the Jameson Canyon Road/SR 12 West Interchange and Red Top Road is also exasperated by the lane drop from five lanes to four lanes in this location.

##### **Underutilized HOV Lanes**

The existing HOV lanes between Red Top Road and Air Base Parkway are underutilized during peak commute periods. During 2011, passenger occupancy counts were performed. Utilization in the existing HOV lanes ranged from 12 to 24 percent during the morning peak hours and 18 to 34 percent during the evening peak hours.<sup>2</sup> This leaves 66 to 88 percent remaining available capacity that is not being utilized. These numbers indicate an unused capacity in the HOV lane where the potential exists to “sell” the available capacity to toll-paying drive-alone users. This underutilized capacity in the HOV lanes results in increased congestion and slower speeds in the general purpose lanes during peak commute periods. Available unused capacity in the existing HOV lane system needs to be utilized to increase vehicle throughput and decrease congestion.

##### **Future No Build Conditions**

Projections of future conditions on the I-80 corridor within the project limits indicate that the demand for travel is expected to be at 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-80 will increase by up to 35 percent by the year 2040. The forecasted conditions indicate a level of congestion that is also expected to cause minor increases in the amount of diversion of through traffic onto local streets, degrade air quality, reduce public transit service reliability, and increase the potential for congestion-related collisions.

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<sup>2</sup> Utilization was based on HOV lane capacity of 1,650 vehicles per hour per lane (vphpl), which is the typical acceptable flow rate for an HOV lane.



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.

Currently slowing occurs on both eastbound and westbound I-80 during weekday morning and evening peak periods, due to factors such as closely spaced ramps, high vehicular volumes merging and diverging, truck movements to and from the Cordelia Truck Scales, and roadway grades and curvature. Areas of slowing include I-80 between the I-680 Interchange and the SR 12 East (to Rio Vista) Interchange, I-80 between Travis Boulevard and Lagoon Valley Road/Cherry Glen Road, and I-80 between the Jameson Canyon Road/SR 12 West Interchange and Red Top Road. Traffic conditions will continue to worsen in both the westbound and eastbound direction of I-80 in the near term (2020) and long-term (2040) in certain segments within the project corridor.

The following locations will operate at LOS D on westbound I-80 during the morning peak period (2020):

- I-80 between Mason Street and Davis Street
- I-80 between Davis Street and Alamo Drive
- I-80 between Alamo Drive and Cherry Glen Road
- I-80 between Cherry Glen Road and Pena Adobe Road/Rivera Road/Pleasant Valley Road
- I-80 between Pena Adobe Road/Rivera Road/Pleasant Valley Road and Lagoon Valley Road/Cherry Glen Road
- I-80 between Lagoon Valley Road/Cherry Glen Road and Manuel Campos Parkway/North Texas Street
- I-80 between Manuel Campos Parkway/North Texas Street and Air Base Parkway/Waterman Boulevard
- I-80 between Air Base Parkway/Waterman Boulevard and Travis Boulevard
- I-80 between West Texas Street/Rockville Road and Abernathy Road
- I-80 between Abernathy Road and SR 12 East
- I-80 between SR 12 East and truck scale

I-80 between the truck scale and Suisun Valley Road/Pittman Road will decrease to LOS E.

Near-term (2020) traffic conditions would operate at LOS D at the following locations on westbound I-80 during the PM peak hour:

- I-80 between Mason Street and Davis Street
- I-80 between Cherry Glen Road and Pena Adobe Road/Rivera Road/Pleasant Valley
- I-80 between Truck Scale and Suisun Valley Road/Pittman Road

Generally, all segments of westbound I-80 operate at a LOS D or better except for I-80 between the truck scale and Suisun Valley Road/Pittman Road which operates at a LOS E. This segment experiences congestion and queuing because of some merging issues experienced by trucks trying to merge from the westbound truck scale on-ramp.

LOS at the following locations will operate at LOS D on eastbound I-80 during the evening peak period in year 2020:

- I-80 between SR-12 West and I-680
- I-80 between I-680 and Suisun Valley Road/Pittman Road
- I-80 between Suisun Valley Road/Pittman Road and Truck Scales
- I-80 between SR-12 East and Abernathy Road
- I-80 between Abernathy Road and West Texas Street
- I-80 between West Texas Street and Beck Avenue
- I-80 between Beck Avenue and Travis Boulevard
- I-80 between Travis Boulevard and Air Base Parkway/Waterman Boulevard
- I-80 between Air Base Parkway/Waterman Boulevard and Manuel Campos Parkway/North Texas Street
- I-80 between Manuel Campos Parkway /North Texas Street and Lagoon Valley Road/Cherry Glen Road
- I-80 between Lagoon Valley Road/Cherry Glen Road and Pena Adobe Road/Rivera Road/Cherry Glen Road
- I-80 between Pena Adobe Road/Rivera Road/Cherry Glen Road and Alamo Drive
- I-80 between Alamo Drive and Davis Street
- I-80 between Davis Street and Peabody Road
- I-80 between Peabody Road and Monte Vista Avenue/Allison Drive/Nut Tree Parkway

Future traffic conditions will worsen in the westbound direction of I-80 in the long term (2040) in certain segments within the project corridor, specifically in the morning peak hour. The LOS at the following locations will operate at LOS D or LOS E:

- I-80 between I-505 and E. Monte Vista Avenue (LOS D)
- I-80 between E. Monte Vista Avenue and Mason Street (LOS D)
- I-80 between Mason Street and Davis Street (LOS E)
- I-80 between Davis Street and Alamo Drive (LOS E)
- I-80 between Alamo Drive and Cherry Glen Road (LOS E)
- I-80 between Cherry Glen Road and Pena Adobe Road/Rivera Road/Pleasant Valley Road (LOS D)
- I-80 between Pena Adobe Road/Rivera Road/Pleasant Valley Road and Lagoon Valley Road/Cherry Glen Road (LOS D)
- I-80 between Lagoon Valley Road/Cherry Glen Road and Manuel Campos Parkway/North Texas Street (LOS D)
- I-80 between Manuel Campos Parkway/North Texas Street and Air Base Parkway/Waterman Boulevard (LOS D)
- I-80 between Air Base Parkway/Waterman Boulevard and Travis Boulevard (LOS D)
- I-80 between Travis Boulevard and West Texas Street/Rockville Road (LOS D)
- I-80 between West Texas Street/Rockville Road and Abernathy Road (LOS E)
- I-80 between Abernathy Road and SR 12 East (LOS D)
- I-80 between SR 12 East and Truck Scale (LOS E)
- I-80 between Truck Scale and Suisun Valley Road/Pittman Road (LOS E)
- I-80 between Suisun Valley Road/Pittman Road and Green Valley (LOS D)
- I-80 between Red Top Road and American Canyon Road (LOS D)

Long-term (2040) traffic conditions would operate at LOS D or LOS E on westbound I-80 at the following locations during the PM peak hours:

- I-80 between Leisure Town Road and I-505 (LOS D)
- I-80 between I-505 and E. Monte Vista Avenue (LOS D)
- I-80 between E. Monte Vista Avenue and Mason Street (LOS D)

- I-80 between Mason Street and Davis Street (LOS E)
- I-80 between Davis Street and Alamo Drive (LOS E)
- I-80 between Alamo Drive and Cherry Glen Road (LOS E)
- I-80 between Cherry Glen Road and Pena Adobe Road/Rivera Road/Pleasant Valley (LOS D)
- I-80 between Pena Adobe Road/Rivera Road/Pleasant Valley and Lagoon Valley Road/Cherry Glen Road (LOS D)
- I-80 between Lagoon Valley Road/Cherry Glen Road and Manual Campos Parkway/N. Texas Street (LOS D)
- I-80 between Manuel Campos Parkway/N. Texas Street and Air Base Parkway/Waterman Boulevard (LOS D)
- I-80 between Air Base Parkway/Waterman Boulevard and Travis Boulevard (LOS D)
- I-80 between W Texas Street/Rockville Road and Abernathy Road (LOS D)
- I-80 between Abernathy Road and SR-12 East (LOS D)
- I-80 between SR 12 East and Truck Scale (LOS D)
- I-80 between Truck Scale and Suisun Valley Road/Pittman Road (LOS E)
- I-80 between Red Top Road and American Canyon Road (LOS D)

Long-term (2040) traffic conditions would operate at LOS D or LOS E on eastbound I-80 at the following locations during the PM peak hours:

- I-80 west of American Canyon Road (LOS D)
- I-80 between American Canyon Road and Red Top Road (LOS D)
- I-80 between Route 680/SR 12 and Green Valley/Lopes Road (LOS D)
- I-80 between Green Valley/Lopes Road and Suisun Valley Road/Pittman Road (LOS D)
- I-80 between Suisun Valley Road/Pittman Road and Truck Scales (LOS D)
- I-80 between SR-12 East and Abernathy Road (LOS D)
- I-80 between Abernathy Drive and West Texas Street (LOS D)
- I-80 between West Texas Street and Beck Avenue (LOS D)
- I-80 between Beck Avenue and Travis Boulevard (LOS E)

- I-80 between Travis Boulevard and Air Base Parkway/Waterman Boulevard (LOS D)
- I-80 between Air Base Parkway/Waterman Boulevard and Manuel Campos Parkway/North Texas Street (LOS D)
- I-80 between Manuel Campos Parkway/North Texas Street and Lagoon Valley Road/Cherry Glen Road (LOS E)
- I-80 between Lagoon Valley Road/Cherry Glen Road and Pena Adobe Road/Rivera Road/Cherry Glen (LOS E)
- I-80 between Pena Adobe Road/Rivera Road/Cherry Glen and Alamo Drive (LOS E)
- I-80 between Alamo Drive and Davis Street (LOS D)
- I-80 between Davis Street and Peabody Road (LOS E)
- I-80 between Peabody Road and Monte Vista Avenue/Allison Drive/Nut Tree Parkway (LOS D)
- I-80 between I-505/Orange Drive and Leisure Town Road (LOS D)

## PUBLIC TRANSIT UTILIZATION

Fairfield and Suisun Transit, Rio Vista Delta Breeze, Vallejo Transit and Yolo Bus operate public bus systems within the project limits. In addition, Fairfield and Suisun Transit operates Solano Express regional routes, Americans with Disabilities Act (ADA) paratransit service and reduced fare taxi program. Bus routes utilizing the corridor within the project limits include:

- Fairfield-Suisun Transit Express Bus Routes 20, 30, 40, and 90
- Delta Breeze Routes 50 and 52
- Vallejo Transit Bus Route 85
- Yolo Bus Route 220

Additionally, private transit services, such as recreational buses to the Lake Tahoe region and the University of California Intercampus Bus between Davis and Berkeley, must also travel in the general purpose lanes along the I-80 corridor between Fairfield and Vacaville. By having to travel in the general purpose lanes of the East Segment, transit vehicles do not provide a significant travel time savings over single-occupant vehicles in this portion of the corridor. This reduces the incentive for commuters and other travelers to utilize transit options along the I-80 corridor.

### 1.3.3 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.

As part of the traffic operations analysis conducted for this project, several configurations of the express lanes beginning and end points were evaluated (see **Alternatives Considered but Eliminated from Further Discussion**). The current project limits west of Red Top Road to east of I-505 showed the most significant benefits in traffic operations along I-80. The current project limits therefore reflect the most logical termini for the I-80 corridor.

The project would reduce traffic congestion without additional improvements, other than what is being proposed, within or adjacent to the project limits. Although the project would contribute to the furtherance of the regional express lane network described in **Section 1.2, State/Regional/Local Planning**, it would be useable and require a reasonable expenditure even if no additional transportation improvements in the area are made; the construction or conversion of other express lanes are not necessary for this project to meet the goals noted above. The I-80 express lanes from west of Red Top Road to east of I-505 would provide the same benefit regardless of whether or not other projects in the area, such as those listed in the *No Build (No Action) Alternative* section, move forward. Moreover, the project has its own funding and is not dependent on any other projects for such funding.

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. Finally, the projects listed in the *No Build (No Action) Alternative* section could proceed without the conversion of HOV lanes to express lanes in the project area.

## WEST SEGMENT – FUNDABLE FIRST PHASE

The project may be constructed under a single construction contract or in multiple phases depending on funding. If phasing occurs, the first phase would consist of the West Segment and would include the conversion of existing HOV lanes into new express lanes along I-80 from the Red Top Road interchange to the Air Base Parkway interchange, including the area around the I-80/I-680 interchange. In the West Segment, existing HOV lanes in both the eastbound and westbound direction would be restriped and repurposed into express lanes. In the opening year (year 2020) condition, the West Segment improvements are forecasted to result in overall travel time savings, and increased overall travel speeds when compared to the No-Build condition, while also providing LOS B conditions or better in the new express lane (see **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**). This indicates that the West Segment has logical termini and independent utility in providing near-term operational benefits to travelers using the I-80 corridor.

## 1.4 PROJECT DESCRIPTION

This section describes the proposed action and the design alternative that was developed to meet the purpose and need of the project: the “Build Alternative” and the “No-Build Alternative.” The project would provide express lanes in both westbound and eastbound direction of I-80 from west

of Red Top Road to the east of I-505, within Solano County, California. The project would construct approximately 18 miles of express lanes in the I-80 corridor through conversion of existing HOV lanes and highway widening for new express lanes. The project limit is approximately 20 miles because of the need to install express lanes signs and equipment 1 mile in advance of the actual express lane entrance. The general location of the proposed improvements extends along I-80 from post mile (PM) R10.4 to 30.2 and passing through the cities of Fairfield and Vacaville. The purpose of the project is to provide an immediate benefit to the traveling public by maximizing the use of the existing freeway infrastructure in a limited/constrained right-of-way to move vehicles through the corridor efficiently. **Figure 1-1** shows the general location of the proposed improvements.

## 1.4.1 PROJECT COST AND FUNDING

### CONSTRUCTION COST

The estimated construction cost of the proposed improvements, in 2014 dollars, for the Build Alternative is \$166,800,000. Construction of the West Segment is \$41,900,000. The breakdown of the cost is provided in **Table 1-1**.

**Table 1-1 Construction Cost Estimate Summary**

	Build Alternative (West and East Segments)	West Segment (Fundable First Phase)
Construction	\$107,500,000	\$24,700,000
Right-of-Way	\$1,500,000	\$100,000
Tolling System Integration (design, installation, and maintenance)	\$21,100,000	\$9,100,000
Capital Outlay Support	\$35,000,000	\$7,200,000
Utility Service	\$1,500,000	\$600,000
<b>Total Cost</b>	<b>\$166,600,000</b>	<b>\$41,700,000</b>

Note: Cost estimates are in 2014 dollars.  
Source: Draft Project Report, 2015

### FUNDING

The current estimated total project cost is \$166.6 million (\$41.7 million for the West Segment), which includes project development, engineering, right of way acquisition, utility relocation, construction capital, and construction support. Currently, the project has \$236.8 million committed in MTC's 2015 TIP. Funds allocated in the 2015 TIP include federal, state, and local sources.

## 1.4.2 ALTERNATIVES

### BUILD ALTERNATIVE

The Build Alternative would allow for express lanes in both the westbound and eastbound direction of I-80 from west of Red Top Road to east of I-505, a distance of approximately 18 miles through

conversion of existing HOV lanes and highway widening for new express lanes. The project limits are approximately 20 miles because of the need to install express lanes signs and equipment 1 mile in advance of the actual express lane entrance. The Build Alternative would implement a continuous access design, and consist of the following primary improvements, discussed in detail further below:

- Installation of static or dynamic signs, electronic tolling equipment, and toll collection
- Retrofit of existing California Highway Patrol (CHP) observation areas
- Mainline restriping and widening
- Installation of ancillary components such as electrical power and communication conduits and any Caltrans required traffic control devices.

The Build Alternative may be constructed under a single construction contract or in phases depending on funding. If phasing occurs, the first phase of the project (West Segment) would include the conversion of existing HOV lanes into express lanes along I-80 from the Red Top Road interchange to the Air Base Parkway interchange, including the area around the I-80/I-680 interchange. The East Segment would construct a new express lane in both the eastbound and westbound directions of I-80 from the Air Base Parkway interchange through the I-80/I-505 interchange. Specific improvements that are physically located within the West Segment are identified where appropriate (i.e., auxiliary lanes, etc.).

For the West Segment, additional work includes the extension of the existing auxiliary lane along eastbound I-80 between Beck Avenue on-ramp and Travis Boulevard off-ramp. This improvement would increase the weaving area between the auxiliary lane and general purpose lanes. The existing off-ramp would be modified into two separate off-ramps. This work would require pavement widening; re-striping; sign and lighting installation; and drainage system improvements.

For the East Segment, the major work includes I-80 inside median pavement widening to provide room for the new express lanes which would require removal of existing median landscaping. The new express lanes require new pavement; concrete barriers; retaining walls; bridge widening at Ulatis and Horse Creeks; median widening at Davis Street and Mason Street undercrossings; new tie-back retaining walls at the eastbound I-80 and northbound I-505 Connector and Cherry Glen overcrossing; drainage culvert extensions; parcel acquisition; and utility/temporary construction easements.

**Appendix D** includes detailed exhibits of the improvements that would be constructed under the Build Alternative. **Chapter 2.0, Affected Environmental Consequences, Avoidance, Minimization, and/or Mitigation Measures**, of this environmental document evaluates the potential effects of the full Build Alternative, including the potential initial phase of construction (West Segment). The environmental consequences and avoidance, minimization and/or mitigation measures specific to the West Segment are identified where appropriate.



## **Express Lane Operations**

### *Continuous Access and Lane Configuration*

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 I-80 express lanes would allow continuous access between the express lane and the adjacent mixed-flow (general purpose) lane. The express lanes would be designated using a skip-striping pavement marking. The diamond markings on existing HOV lanes would be permanently removed. The express lane width would be 12-feet wide where feasible.

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-80 express lanes for free. Solo users, for whom time saving is of a value, who want a more convenient and reliable trip can choose to use the new express lane for a dynamically charged fee. The toll that is charged will vary depending on the real-time traffic operating conditions in both the express lane and in the general purpose lanes. Two-axle, delivery-type trucks would also be allowed to use the new converted facility for a fee, but trucks with three or more axles would be excluded from the lane.

Bay Area HOV lanes currently operate during the morning and evening peak commute periods and serve as general purpose lanes during all other times. The existing HOV lanes within the West Segment currently operate Monday to Friday between 5 to 10 AM and 3 to 7 PM. The expected express lane hours of operations would maintain the existing HOV lane time periods.<sup>3</sup>

### *Enforcement*

Per statutes (Streets and Highways Code, Section 149) HOVs are allowed to use express lanes free of charge. The proposed express lanes would operate with a two-or-more (2+) person per vehicle requirement, as determined by Caltrans. The express lanes would also provide solo drivers the choice to pay a toll electronically to use the lane.

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.

Although the use of LPR and toll transponders would automate toll violation enforcement, CHP field personnel would still be required to perform occupancy enforcement. CHP enforcement responsibilities would focus on occupancy verification and other traffic violations (i.e., illegal access in restricted zones and speeding). To allow CHP enforcement of the express lanes, protected observation areas would be provided within the freeway median for the officers to safely park their

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<sup>3</sup> 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 Caltrans, CHP, and MTC.

vehicles to conduct occupancy verification and traffic observation. The CHP observation areas would be located within the 22 foot wide highway median. The center of the CHP area would accommodate a 25 feet long by 12 feet (face of barrier to face of barrier) wide CHP cruiser pad which would be elevated 18 inches above the roadway pavement elevation. The CHP pad would be protected by concrete barriers on both sides. A toll gantry would be located 85 feet from center of the CHP cruiser pad. The nonstandard inside shoulders adjacent to the CHP observations areas would require Caltrans approval. Potential CHP observation areas are identified in **Table 1-2**. There are two existing CHP observation areas within the West Segment that would be modified under the Build Alternative to conform to current CHP observation standards. All of the proposed CHP observation areas would provide directional access to eastbound I-80, with the majority providing bi-directional access to both eastbound and westbound travel lanes.

**Table 1-2 Potential CHP Observation Areas**

General Location Description	Direction	Post Mile
<b>West Segment</b>		
Existing area between WB SR 12 OC and Green Valley Road OC	EB	12.1
Existing area between Suisun Creek Bridge and EB SR 12 OC	WB & EB	15.2
<b>East Segment</b>		
Proposed between Air Base Parkway OC and North Texas Street	WB & EB	20.2
Proposed between Allison Drive OC and Nut Tree Road OC	WB & EB	27.4

Notes: SR = State Route; OC = overcrossing; EB = eastbound; WB = westbound  
Source: Draft Project Report, 2014

## Electronic Tolling

The toll rate for solo drivers who choose to use the express lane would change depending on the level of traffic congestion and distance traveled. 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 of the additional capacity of the 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 express lane, which frees up space within the express lane and allows for more free-flowing traffic conditions. 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.

There are four proposed tolling zones, two within each segment of the project corridor. 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. Each toll zone would contain the following equipment serving the toll collection and violation enforcement systems: cantilevered gantry; antenna; toll

reader; vehicle sensor; rear-plate facing camera; rear-plate facing light and enforcement beacons; PTZ (pan tilt zoom) CCTV (closed circuit television) cameras; MVDS (magnetometer vehicle detector station) and related equipment would also be installed to monitor the congestion in the express lanes.

The first Variable Toll Message Sign (VTMS) would be installed approximately 0.5 to 1 mile before the start of the express lane. Subsequent VTMS would have an approximate spacing of 1.5 to 2 miles. The first toll reader would be located within 1,000 feet after the entrance sign. Subsequent toll readers will be placed downstream of their respective VTMS. Multiple read points may be installed for a single VTMS. The distance between a VTMS and its last read point pairing will be no more than 1 to 1.5 miles. The factors which will affect the placement of VTMS and toll readers beyond system requirements include: spacing between interchanges, visibility of signs, spacing with existing overhead signs, conflicts with existing facilities, and environmental impacts.

**Figure 1-2** illustrates the gantry/reader structure that would support the tolling equipment. The overhead sign structures would also include toll reader and toll enforcement equipment.

The tolling equipment would be mounted on a single 12-inch diameter post on a standard foundation, or attached to an overhead sign structure. It would be on a cast-in-drilled-hole pile foundation with an expected pile depth of 11 feet and maximum 36-inch diameter foundation. The expected barrier width adjacent to the electronic tolling equipment would be between 4 feet and 8 feet. In constrained areas, steel plates would be used to minimize impact along the inside shoulder resulting in a barrier width of 3 feet-8 inches. The 1 foot-7 inch diameter base plate would be located on top of the concrete barrier.

The PTZ, CCTV and MVDS equipment would be mounted on standard 40-foot round tapered steel pole. It would be on a cast-in-drilled-hole pile foundation with an expected maximum pile length of 8 feet 6-inches and maximum 2 feet-6 inches diameter foundation and located along the outside of the highway pavement.

Variable pricing would be the principal mechanism for access to the proposed express lanes. The price would be adjusted depending on the existing congestion and available capacity on the express lanes. By raising or lowering the toll in response to the level of demand, this dynamic pricing effectively manages the volume of traffic in the express lanes, ensuring that traffic flows smoothly. VTMS will communicate to drivers the toll to travel in the current zone as well as the toll to popular destinations at the end of the segment.

### Signage

The express lanes 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 68 overhead sign structures have been proposed for this project:

- 39 new signs would be constructed in the East Segment
- 29 new signs would be constructed in the West Segment

A summary of the sign types is provided below.

- **Static/Non-Electrical Signs**
  - *Express Lane Entrance Signs* – 1-mile and 0.5-mile 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.
  - *FasTrak® Signs and Toll Readers* – overhead sign structures indicating HOV and FasTrak® use only would be placed at intervals to alert new drivers merging to I-80 about the lane restriction. Toll readers will be placed at approximately 1 mile spacing. Wherever possible, the toll readers will be mounted on the proposed FasTrak® signs. In some cases, the toll readers will be mounted on a modified street light pole (gantry). In restricted conditions, the toll readers may be mounted on the proposed VTMS. For every toll reader, a set of toll enforcement equipment will be installed. Depending on site restrictions and design constraints, the enforcement equipment may either be mounted on the same overhead structure/gantry with the toll readers, or mounted separately on poles on existing median concrete barrier.
- **Dynamic/Variable Signs**
  - *Variable Toll Message Sign* – Dynamic electronic message signs would display the toll pricing for the current zone as well as the following zone. The price would change depending on the congestion level and available capacity in the express lanes. The panel size would vary depending on the sign type. The maximum panel size is 29 feet long by 13 feet high. **Figure 1-3** provides illustrations of the types of VTMS signs that would be installed along the I-80 express lanes.

Smaller signs would be post-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. 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.

The panel size would vary depending on the sign type, as illustrated in **Figure 1-3**. The static/non-electrical signs that would be the most common overhead sign type within the project corridor would be approximately 17 feet long by 6 to 7 feet high. The maximum panel size would be associated with the VTMS signs, which are designed to be approximately 29 feet long by 13 feet high.

### **Auxiliary Lane Realignment (West Segment)**

The existing auxiliary lane along eastbound I-80 between the Beck Avenue on-ramp and Travis Boulevard off-ramp would be extended by approximately 752 feet in order to increase the length of the weaving area between the auxiliary lane and general purpose lanes. The existing off-ramp

would be modified into two separate off-ramps. The proposed off-ramp to eastbound Travis Boulevard would be 17 feet east of the existing off-ramp, and would be constructed as a standard single exit ramp. The new off-ramp to westbound Travis Boulevard would be approximately 752 feet east of the existing off-ramp. This work would require pavement widening, re-striping, sign and lighting installation, and drainage system improvements.

### Modified/Replaced Structures (East Segment)

**Table 1-3** identifies the six overcrossing and undercrossing structures that would be widened or modified to accommodate widening of I-80 within the East Segment of the project limits. The conversion of the existing HOV lanes in the west segment of the project limits would not require the modification of existing structures along I-80.

**Table 1-3 Modified/Replaced Structures (East Segment)**

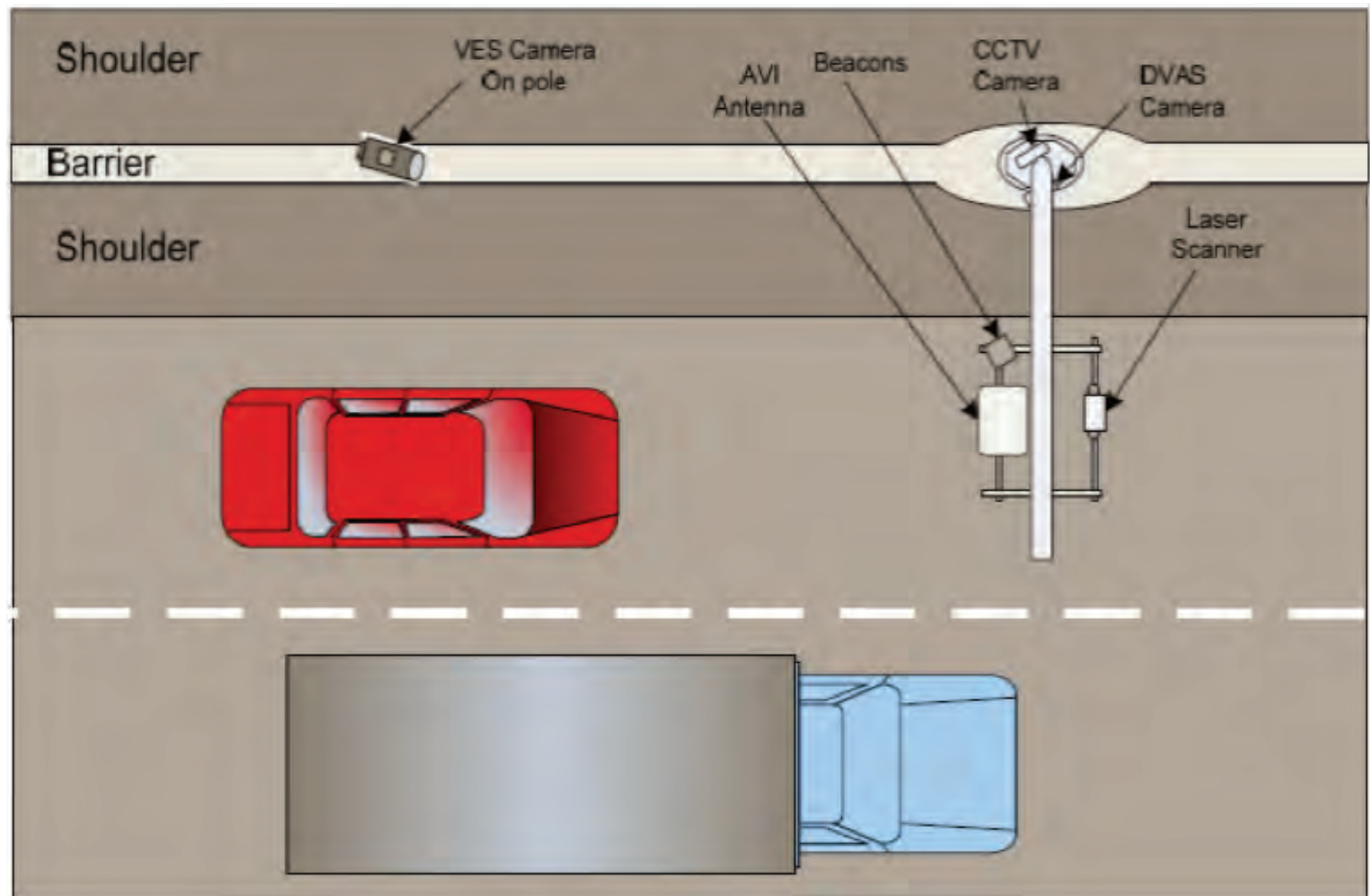
Structure	Post Mile	Modification	Description
Cherry Glen Road OC	23.13	Abutment Wall Modification	Tie-Back Retaining Wall
Davis Street UC	26.00	Deck Widening	Inside Widening
Mason St. UC	26.46	Deck Widening	Inside Widening
Ulati Creek Bridge	26.61	Deck Widening	Inside Widening
EB I-80/NB I-505 Connector	28.36	Abutment Wall Modification	Tie-Back Retaining Wall
Horse Creek Bridge	R28.57	Deck Widening	Inside and Outside Widening

Table Notes: OC = overcrossing; UC = undercrossing; EB = eastbound; NB = northbound  
Source: Draft Project Report, 2014

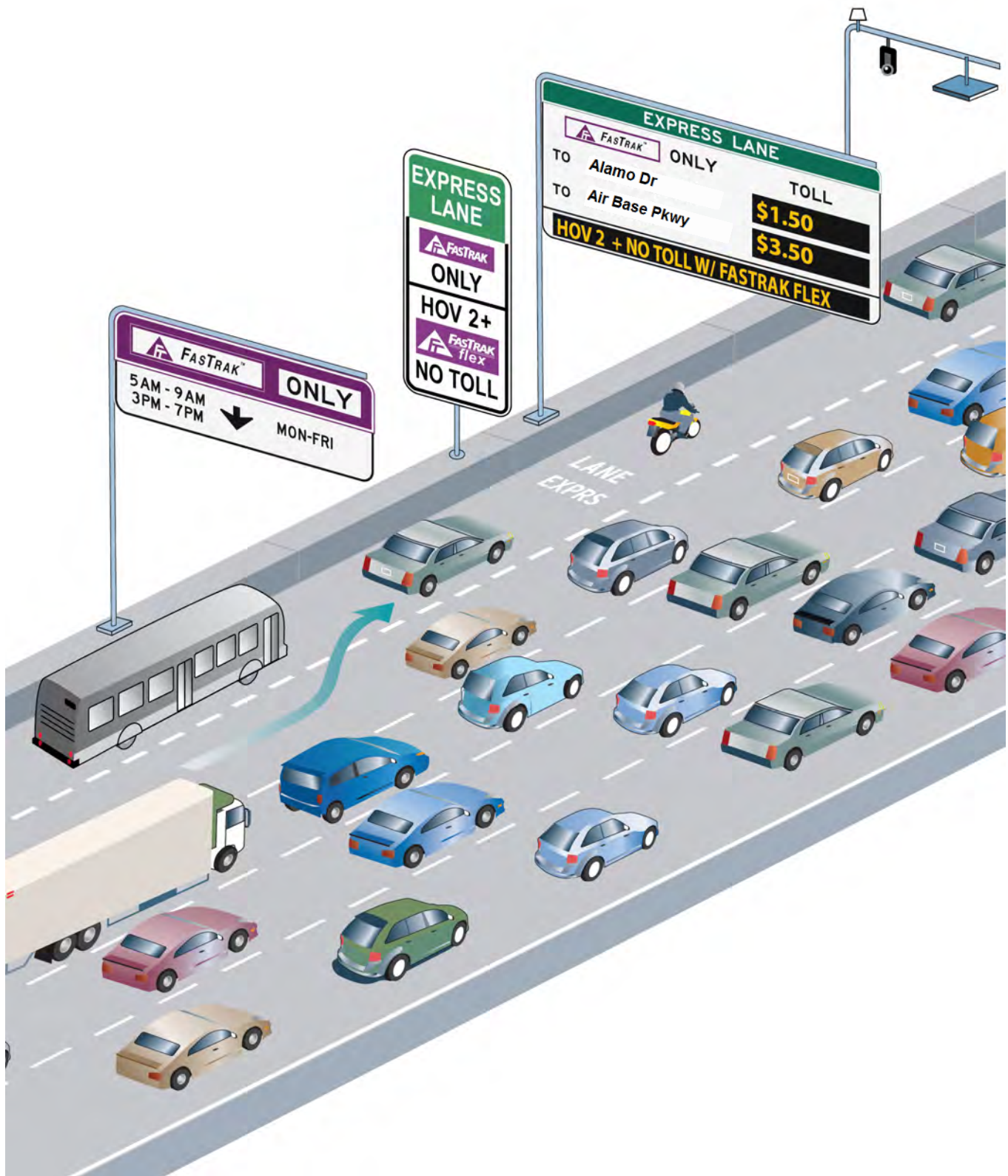
### Retaining Walls and Proposed Sound Walls

Extensive retaining walls would be constructed to address ROW and environmental constraints while accommodating the northbound I-80 widening associated with the East Segment of the Build Alternative. Three retaining earth systems are proposed along the outside and two in the median of eastbound and westbound I-80 within the East Segment. Retaining wall heights would vary from 1 to 15 feet (see **Table 1-4**). No retaining walls are proposed in the West Segment.

The project would include construction of a sound wall in the East Segment along eastbound I-80 from the Ulati Creek Bridge to the Allison Drive off-ramp (see **Section 2.2.7, Noise**). The final decision for sound wall construction would be made upon completion of the project design and the public involvement process. No sound walls are currently proposed in the West Segment.



Tolling System Design and Operations



Variable Toll Message Sign (VTMS)

Figure

1-3

## **Ancillary Project Components**

### *Storm Water Treatment*

Runoff from the freeway is generally conveyed to existing dikes and overside drains. The existing drainage patterns are not expected to change within the West Segment. The quantity of added impervious area would not be significant enough to change the drainage flow rate, and all storm water runoff would be properly conveyed through pipe, ditches, and bioretention swales in the West Segment. Minor modifications to these drainage systems would be required to accommodate the proposed freeway widening within the East Segment. Where feasible, dikes and overside drains would be constructed to replace existing systems. Locations where walls and barriers are installed, pipe and inlet drainage systems would be installed to convey water back to roadside systems. Existing depressed median drainage systems would be capped and abandoned.

Drainage crossing I-80 would be extended. Additional drainage structures would also be constructed to mitigate water quality and hydromodification impacts for the proposed improvements.

The proposed permanent storm water treatment facilities for the Build Alternative would include biofiltration strips, biofiltration swales, detention basins, and sand filters. Biofiltration strips are vegetated sections with a compost blanket and hydroseeding, where storm water sheet flows. Biofiltration swales are vegetated ditches with hydroseed on the side slopes, a layer of imported biofiltration soil underneath, and a layer of permeable material with an underdrain further below, where storm water is in concentrated flow. Detention basins temporarily detain storm water and reduce sediment and particulate loading by storing storm water in a basin and discharging through a water quality outlet/riser with openings. A typical sand filter system consists of two or three chambers, which remove floatables and heavy sediments. Treated filtrate is discharged through an underdrain system either to a storm drainage system or directly to surface waters. Sand filters take up little space and can be used on highly developed sites.

### *Electric Conduit*

The variable signs and tolling equipment would be connected to electrical power and communication sources that are independent of existing Caltrans systems. Some static signs would require electrical power for lighting. The conduits and fiber would be extended from existing sources and would require trenching and/or horizontal directional drilling to bring these services to the service equipment enclosure, telephone demarcation cabinet, controllers, signs and tolling equipment. Trenching would be approximately 1-foot wide and 30 inches to 5-feet deep. The horizontal directional drilling may be as deep as 5 feet but the depth would depend on the location of existing utilities within the vicinity of the proposed drilling location. The boring and receiving pits may be up to 10 feet wide. Installation of pull boxes and electrical systems such as service equipment enclosures, telephone demarcation cabinets, controllers, and foundation pads would follow Caltrans standards. The maximum foundation pad footprint would be 3 feet by 4 feet with a maximum depth of 2 feet. In unpaved areas, a raised concrete pad in front of the controller cabinet would be required. Temporary construction access to power and communication sources may be



needed. Work associated with bringing electrical power and communication to service enclosure cabinets would be completed by the utility provider and would follow utility provider standards.

### *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 would 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. **Table 1-5** summarizes the locations of new lighting proposed for both the West and East Segments.

Lighting will be provided in the following locations in both the eastbound and westbound direction:

- 1,000 feet approaching the beginning of the express lane
- 2,000 feet at the toll zone change (including 1,000 feet approaching and 1,000 feet departing the toll zone change)
- 1,000 feet departing the end of the express lane
- Mounted on VTMS
- Two lights in each direction (eastbound and westbound I-80) at all proposed CHP observation areas

**Table 1-4 Location and Type of Retaining Walls (East Segment)**

Retaining System No.	I-80 WB (Outside) (post miles)	I-80 Median (post miles)	I-80 EB (Outside) (post miles)	Retained Height (feet)	Retain Cut/Fill	Ground Behind Proposed Wall	Recommended Retaining Wall System
1	N/A	N/A	20.03 - 20.09	0-1	Fill	Level	Caltrans Standard Retaining Wall
2		21.99 - 22.21	N/A	3-7	Fill	Level	Caltrans Standard Retaining Wall
3		22.34 - 23.14		3-9	Fill	Level	Caltrans Standard Retaining Wall
Cherry Glen Road OC							
4	23.14 - 23.16	N/A	N/A	0-7	Cut	Sloping	Sub-Horizontal Ground Anchored Wall
EB I-80/NB I-505 Connector Separation							
5	N/A	N/A	28.29-28.33	0-15	Cut	Sloping	Sub-Horizontal Ground Anchored Wall

Notes: WB = westbound; EB = eastbound; NB = northbound; OC = overcrossing; post miles are approximate  
Source: MTCO, 2014

**Table 1-5 Summary of East and West Segment Lighting**

<b>I-80 Direction (EB/WB)</b>	<b>Post Miles</b>	<b>Description of Location</b>
<b>West Segment</b>		
EB	11.26-11.45	Beginning of EB express lane near Red Top Road
WB	12.20-12.40	End of WB express lane near Green Valley Road
EB	13.15-13.27	Non-standard weave section near Pittman Road
EB	15.77-16.16	EB toll zone change near Abernathy Road
WB	17.29-17.51	WB toll zone change near West Texas Street
N/A	17.90	Modified Travis Boulevard off-ramp
EB	18.65-18.90	Express lane east of Waterman Boulevard (future phases only)
WB	19.21-19.53	Express lane west of Waterman Boulevard (future phases only)
EB	19.81-20.01	End of EB express lane west of North Texas Street
WB	20.01-20.20	Beginning of WB express lane west of North Texas Street
N/A	12.11 and 15.2	Four lights at CHP observation areas near the existing eastbound (east of SR 12) and westbound (west of Abernathy Road) CHP enforcement areas
<b>East Segment</b>		
EB & WB	20.16 – 20.54	EB toll zone change (butterfly lights in median) near North Texas Street
EB & WB	25.01 – 25.59	EB & WB toll zone change (butterfly lights in median) near Alamo Drive
EB	28.55 – 28.73	End of EB express lane east of I-505
EB	28.60 – 28.90	On-ramp lighting for I-505 and Orange Drive EB I-80 On-Ramps
WB	29.15 – 29.34	Beginning of WB express lane east of I-505
EB & WB	19.98 and 27.65	Four lights (butterfly lights in median) two lights at each proposed CHP observation area

Note: EB= eastbound; WB= westbound; Post miles are approximate  
Source: Mark Thomas & Co., 2014, HDR Engineering, Inc. 2014

## **Right-of-Way Requirements**

The existing ROW along I-80 generally accommodates the proposed improvements with a few minor exceptions associated with construction staging and/or utility easements. The majority of ROW requirements involve acquisition of portions (or slivers) of properties along the project corridor. For the West Segment, the ROW requirements involve acquisition of nine (9) utility easements, and minor temporary construction easements. The ROW requirements for the East Segment involve acquisition of a portion of one parcel (from the City of Vacaville at Orange Drive on-ramp) within the project limits, eighteen (18) utility easements, and minor temporary construction easements. No acquisition of any residences or businesses would be required.

## **Construction**

### *West Segment*

The West Segment portion of the project may be constructed first. Construction of the West Segment is anticipated to commence in Spring 2017 and be operational by Fall 2018. In order to minimize delays and congestion caused by construction, it is anticipated that each segment would be constructed in multiple stages and/or multiple work crews. I-80 would generally be open during construction. However, some short-term lane closures may be required during critical construction periods, where freeway traffic cannot be permitted in the construction areas for safety reasons. Any closures would require advance approval by the Resident Engineer and would be allowed only during periods of low traffic defined through traffic studies made during the design phase of the project.

Construction for the West Segment would take approximately 14 months to complete. The work to install the overhead signs and electronic tolling equipment in the median would be coordinated between the civil infrastructure and toll systems work crews, completing the installation of sign structures prior to any tolling equipment being installed. At areas where the existing median is 8 feet wide or less, it is anticipated that the work would be performed during nighttime with temporary freeway and shoulder lanes closures. Where there is substantial space in the median to install temporary railing, work can be performed behind the railing during the daytime and nighttime hours. The remaining activities such as mainline restriping, work adjacent to the outside shoulders and modification of eastbound Travis Boulevard off-ramp would be completed after the median work. These activities would also require temporary freeway lane, shoulder lane or off-ramp closure.

### *East Segment*

Construction for the East Segment would be constructed in two major stages, and would take approximately two years to complete. The first stage would include the median widening and other activities within the median such as installation of overhead signs and electronic tolling equipment. These activities would require the removal of all existing vegetation from the median. This stage would be performed behind temporary railings. The second stage would include the outside pavement widening and other activities to be performed adjacent to the outside shoulder. These activities would require the removal of some roadside vegetation. Work would also be completed

behind temporary railing. The proposed minor ramp work would be accomplished during the second stage. Retaining walls and structure modifications would be constructed with the associated widening work in each stage. It is expected that majority of the work would be done during daytime hours. Some nighttime work may require temporary closures for tasks that could interfere with mainline traffic or create safety hazards such as the proposed pavement resurfacing and mainline restriping. Some temporary nighttime ramp closures may be necessary during paving and striping operations as well.

Transportation Management Plan will be developed, in cooperation with the cities of Fairfield and Vacaville, to provide advance notice to motorists and transportation and emergency service providers of information on construction activities and durations, detours, and access issues during each stage of construction. Specific construction staging requirements will be defined during the final design phase and an actual construction staging plan would be developed by the contractor.

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 in the East Segment, as previously described. Deeper excavations and the placement of numerous structural pilings would occur at depths of no more than 45 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.

#### *Utility Relocations*

The following utility companies have known facilities within the project limits: AT&T, Comcast, City of Fairfield, City of Vacaville, Solano Irrigation District, the Bureau of Reclamation, and PG&E. The Build Alternative would include utility relocations, as necessary, to construct the above-described improvements.

### TRANSPORTATION SYSTEM MANAGEMENT (TSM) AND TRANSPORTATION DEMAND MANAGEMENT (TDM) 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 TSM measures alone could not satisfy the purpose and need of the project, the following TSM measure has been incorporated into the Build Alternative (West Segment) for this project:

- Extending the existing auxiliary lane along eastbound I-80 between Beck Avenue on-ramp and Travis Boulevard off-ramp;

There are several TDM strategies within the San Francisco Bay Area that are used to reduce the number of vehicle trips within the I-80 corridor. Rideshare offers carpoolers reduced bridge tolls as well as access to carpool lanes. There are also vanpools for larger groups of commuters. TDM 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 TDM alternative would not substantially improve the safety and operation of the freeway. TDM alternative by itself would not satisfy the purpose of the project.

## PROPERTY ACQUISITIONS AND TEMPORARY CONSTRUCTION EASEMENTS

While the majority of the improvements can be constructed within the existing right-of-way, some easements and land acquisitions would be required. In the West Segment, the Build Alternative would require temporary construction easements and permanent utility easements. In the East Segment, the Build Alternative would require temporary construction easements, permanent utility easements, and require permanent, but minor slivers of land acquisitions for roadway widening. Generally, utility easements entail installation or connection to underground infrastructure. Once the utility infrastructure is installed and/or connected to, the land would return to its original use. **Tables 1-6 and 1-7** summarize the proposed property acquisitions, including easements.

In the West Segment, the proposed project would require 0.27 acres of land for temporary construction easements and 0.09 acres of land for permanent utility easements. Such easements would cover a small portion of 10 different parcels. In the East Segment, the proposed project would require 0.79 acres of land for temporary construction easements, 0.35 acres of land for permanent utility easements, and 1.62 acres of land for permanent fee/acquisition. Such easements would cover a small portion of 17 different parcels. Of these 17 parcels within the East Segment, utility easements would occur on 9 parcels, temporary construction easements would occur on 6 parcels, a fee acquisition and temporary construction easement would occur on 1 parcel, and temporary construction easement and a utility easement would occur on 1 parcel. One utility easement in the East Segment would require a 20 foot wide acquisition of approximately 30 private parking spaces from an auto repair and dealer commercial business (parcel number 0133120240). Upon completion of construction in this area, the affected portion of the parking lot will be restriped to restore parking spaces to their current number.

**Table 1-6 West Segment Land Acquisitions**

APN	Existing Use	Type	Area (Acre) TCE	Area (Acre) Utility Easement
Unknown	N/A	TCE	0.007	0.000
0044090450	Commercial	Utility Easement and TCE	0.013	0.002
0027350070	Commercial	Utility Easement and TCE	0.171	0.017
0150200100	Miscellaneous	Utility Easement and TCE	0.008	0.002

APN	Existing Use	Type	Area (Acre) TCE	Area (Acre) Utility Easement
0150200020	Service Station	Utility Easement and TCE	0.008	0.002
0152290020	Retail Trade	Utility Easement and TCE	0.016	0.004
0034011070	Multi Family Dwelling	Utility Easement and TCE	0.007	0.003
0156140050	Commercial	Utility Easement and TCE	0.014	0.007
0167130140	Commercial	Utility Easement and TCE	0.013	0.008
0167110170	Commercial	Utility Easement and TCE	0.014	0.004
		<b>Total:</b>	<b>0.270</b>	<b>0.086</b>

Source: Caltrans, 2014d

Note: Temporary Construction Easement (TCE)

**Table 1-7 East Segment Land Acquisitions**

APN	Existing Use	Type	Area	
			Sq.Ft.	Acre
167130140	Governmental & Miscellaneous	Utility Easement	381	0.01
167431020	Vacant Residential Land	Utility Easement	3,035	0.07
167090010	Governmental & Miscellaneous	Utility Easement	866	0.02
167010030	Taxable below min. value	Utility Easement	1,508	0.03
122130050	Governmental & Miscellaneous	Utility Easement	630	0.01
127030080	Vacant Commercial Land	Utility Easement	347	0.01
127040090	Vacant Commercial Land	Utility Easement	1,042	0.02
127040100	Taxable below min. value	Utility Easement	293	0.01
131020530	General Retail Commercial	TCE	48	0.00
131020470	Taxable below min. value	TCE	1,713	0.04
131420220	Commercial Sales & Services	TCE	2,043	0.05
131430090	Vacant Commercial Land	TCE	3,837	0.09

APN	Existing Use	Type	Area	
			Sq.Ft.	Acre
131430210	Commercial Sales & Services	TCE	2,235	0.05
134341010	Taxable below min value	Fee Acquisition and TCE	91,249	2.09
134351060	Commercial	TCE	1,929	0.04
133120240	Auto Repair & Dealers	TCE and Utility Easement	9,329	0.22
134480080	Commercial	Utility Easement	219	0.00
		<b>Total:</b>	<b>120,704</b>	<b>2.76</b>

Source: Caltrans, 2014d

Note: Temporary Construction Easement (TCE)

## 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-80 corridor would remain as they currently exist. No bridge structures would be widened. Traffic volumes within the project corridor would continue to increase under the No-Build Alternative. Other planned and approved transportation improvements along local routes may be implemented by local agencies or under other projects. **Table 1-8** lists the projects assumed to be completed prior to construction of the project. The No-Build Alternative is considered the environmental baseline for comparing environmental impacts under the National Environmental Policy Act (NEPA).<sup>4</sup>

<sup>4</sup> 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) is issued or at the time the environmental studies began. Near-term (2020) and long-term (2040) impacts are also considered under CEQA; similar to the No-Build baseline used for NEPA.



**Table 1-8      Planned Improvements to be Completed Prior to Project Construction**

<b>Project Name (EA No.)</b>	<b>Project Limits and Description</b>	<b>Status</b>
I-80/I-680/SR 12 Interchange Project  Phase 1, Initial Construction Package  (EA 04-0A5344)	<p><b>Limits:</b> From 0.7 mile west on SR-12 West to SR-12 West/I-80 and on WB I-80 from SR-12 West/I-80 to I-80/I-680.</p> <p><b>Description:</b> Realignment of WB I-80 from east of the I-80/I-680 IC to SR-12 West connector, relocation of the Green Valley Road IC to the east and reconfiguration of the SR-12 West ramps and Green Valley Road on-ramp. The WB I-80 realignment to the north will provide for a wider median to accommodate the future I-680/I-80 HOV Lanes Connector (Package 6 of the I-80/I-680/SR-12 IC Project) and correct the nonstandard typical section on WB I-80 between the relocated Green Valley Road IC and the SR-12 West.</p>	Anticipated Construction Completion 2016
I-80 Ramp Metering  (EA 04-153504)	<p><b>Limits:</b> Along I-80 in Solano County, within the cities of Vallejo, Fairfield and Vacaville; from the Contra Costa County Line to I-505.</p> <p><b>Description:</b> Install ramp metering, traffic operating systems, metal beam guardrail, and sign structures, and widen ramp</p>	Completed 2014
Bridge Widening  (EA 04-0A0904)	<p><b>Limits:</b> On I-80 in Solano County, in and near Vacaville from 0.2 mile west of Alamo Creek Bridge to 0.2 mile east of Alamo Creek Bridge.</p> <p><b>Description:</b> Widen bridge and construction drainage</p>	Anticipated Construction Completion 2016

The largest planned improvement project within the project limits is the I-80/I-680/SR-12 Interchange (ICP) – Phase 1 Project, which will be constructed with seven individual construction packages. The project report for the preferred alternative and the corresponding Phase 1, Initial Construction Package for the ICP was approved in October 2012. The Phase 1 of the ICP will include numerous improvements to address existing and future traffic operations and congestion, including relocation of the Cordelia Westbound Truck Inspection Facility. Proposed improvements are intended to add freeway capacity, reduce cut through traffic on local roads, improve local access to and from the freeway, accommodate current and future truck volumes, improve safety and increase the use of HOV lanes and ridesharing. The existing highway geometry on I-80, within the limits of the West Segment, has been adjusted in the design of this I-80 Express Lanes Project to include proposed improvements from Phase 1 of the ICP.

## COMPARISON OF ALTERNATIVES

The Build Alternative would convert HOV lanes to express lanes along I-80 from west of Red Top Road to east of I-505, striving to meet the goals discussed in **Section 1.3.1, Purpose**. The No-Build Alternative would not include this conversion, but other planned improvements shown in **Table 1-8** may be implemented. The No-Build Alternative would not address the needs described in **Section 1.3.2, Need**, and therefore would not provide an immediate benefit to the traveling public by maximizing the use of existing freeway infrastructure and expanding capacity.

### 1.4.3 FINAL DECISION MAKING PROCESS

After the public circulation period, all comments were considered, and Caltrans selected a preferred alternative and made the final determination of the project's effect on the environment. As no immitigable significant adverse impacts are identified under CEQA, Caltrans prepared a Mitigated Negative Declaration in accordance with CEQA. . Similarly, Caltrans determined the action does not significantly impact the environment, so Caltrans, as assigned by the FHWA, has issued a Finding of No Significant Impact (FONSI) in accordance 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. A Notice of Determination (NOD) will be published for compliance with CEQA.

### 1.4.4 IDENTIFICATION OF A PREFERRED ALTERNATIVE

Within the existing project corridor, no other build alternatives were deemed viable (see **Section 1.4.5, Alternatives Considered but Eliminated from Further Discussion**). As such, the alternatives considered for the project include the Build Alternative and the No-Build Alternative. The Build Alternative has been identified as the preferred alternative. Final identification of the preferred alternative occurred after the public review and comment period, as described above.

The following summarizes the reasons for choosing the Build Alternative over the No Build Alternative:

- Increase vehicle and passenger throughput and decrease congestion on the I-80.**  
 Under existing conditions, during the weekday morning and evening peak commute hours, slowing occurs on both eastbound and westbound I-80. Factors that contribute to the slowing of I-80 traffic between the I 680 Interchange and the State Route 12 (SR 12) East (to Rio Vista) Interchange include closely spaced ramps, high vehicular volumes merging and diverging from the general purpose travel lanes, and truck movements to and from the Cordelia Truck Scales. Factors that contribute to slowing of traffic between Travis Boulevard and Lagoon Valley Road/Cherry Glen Road include high traffic volumes associated with popular destinations such as Travis Air Force Base and retail areas within the Solano Mall; and the curvature and roadway grades near Lagoon Valley Road/Cherry Glen Road. The slowing of westbound I-80 traffic between the Jameson Canyon Road/SR 12 West Interchange and Red Top Road is also exasperated by the lane drop from five lanes to four lanes in this location.

Under the Build Alternative, a continuous access design will be implemented and consist of the following primary improvements; installation of static or dynamic signs, electronic tolling equipment, and toll collection, retrofit of existing California Highway Patrol (CHP) observation areas, mainline restriping and widening, and installation of ancillary components such as electrical power and communication conduits and any Caltrans required traffic control devices. Vehicle and passenger throughput will increase due to the associated improved utilization of existing HOV lane capacity from Red Top Road to east of Air Base Parkway. Additionally, the Build Alternative will result in increased capacity to meet existing and future travel demand from east of Air Base Parkway to I-505.

- **The Build Alternative will offer non-carpool eligible drivers a reliable travel time option.** Under existing conditions, travel time along the I-80 is unreliable due to slowing of traffic between Travis Boulevard and Lagoon Valley Road/Cherry Glen Road, as well as the slowing of westbound I-80 traffic between the Jameson Canyon Road/SR 12 West Interchange. Under the Build Alternative 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 new express lane during the hours of operation. Eligible vehicles with HOV status will continue to use the I-80 express lanes for free. Solo users, for whom time saving is of a value, who want a more convenient and reliable trip can choose to use the new express lane for a dynamically charged fee. Two-axle, delivery-type trucks would also be allowed to use the new converted facility for a fee, but trucks with three or more axles would be excluded from the lane. The Build Alternative will therefore offer non-carpool eligible drivers a reliable travel time.
- **Improve public transit utilization by reducing public transit travel times in the corridor.** Under existing conditions transit vehicles do not provide significant travel time savings over single-occupant vehicles as they have to travel in the general purpose lanes of the East Segment of the corridor. This reduces the incentive for commuters and other travelers to utilize transit options along the I-80 corridor. With the implementation of the Build Alternative and the associated repurposing of the underutilized HOV lanes into express lanes, travel times will improve and thus encourage utilization of public transit. Additionally, toll rates for solo drivers who choose to use the express lane would change depending on the level of traffic congestion and distance traveled. 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 of the additional capacity of the 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 express lane, which frees up space within the express lane and allows for more free-flowing traffic conditions. The improved traffic conditions associated with the tolling system provides increased incentive to utilize public transit.

The Build Alternative is the preferred alternative because it meets the purpose and need of the project. The No-Build Alternative would not satisfy the purpose and need of the project.

## 1.4.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER DISCUSSION PRIOR TO DRAFT ENVIRONMENTAL DOCUMENT

### PROJECT STUDY REPORT-PROJECT DEVELOPMENT SUPPORT ALTERNATIVE

The Preliminary Study Report was prepared and approved for this project in 2012. Two build alternatives were considered:

- Alternative A would implement continuous access express lanes with minimal improvements to the existing facility; and
- Alternative B would implement 12-foot express lanes with ingress and egress access locations, 4-foot buffer, and improvements to the existing facility to meet current design standards. Improvements to meet current design standards included 36-foot paved median, concrete median barrier, correction for existing nonstandard sight distances, new auxiliary lanes, modification/relocation of 25 roadway and creek bridges, and the modification and construction of soundwalls and retaining walls.

Alternative B was determined to not be viable because it required significant impacts to over 100 urban and rural parcels including displacement of persons/businesses and major relocations of both high and low risks facilities. The project cost was estimated at \$1.4 billion in 2015 dollars which included \$990 million for construction capital, \$75 million for right of way capital and \$335 million for capital outlay support.

The current Build Alternative evaluated in this environmental document is comparable to Alternative A.

### MANAGED LANE DESIGN, ACCESS CONSIDERATION

The adopted 2011 Traffic Operations Policy Directive (TOPD) for Managed Lane Design requires consideration for both limited-access design and continuous-access design to better assess the capital costs for construction and operating expenses and the freeway's performance and operations benefits. The TOPD also requires performance of an operational analysis and a safety analysis for any HOV conversion project. The studies would disclose the operational impact due to the proposed express lane and access openings on a limited-access design and safety impact on operating conditions and the potential for collision due to the proposed improvements.

STA prepared a Continuous Access White Paper and presented the findings to Caltrans and MTC on March 9, 2011. The white paper discussed standard design, completed and upcoming express lane projects, access options along the I-80 corridor through Fairfield and Vacaville, and issues influencing continuous access. The recommended access option for I-80 was continuous access since this approach would balance the need to closely match current HOV lane legacy access conditions, promote effective utilization of the express lanes, meet bus transit service requirements, provide the opportunity for monitoring and enforcement at toll zones, and achieve a

project operation and design that is able to be expeditiously implemented with minimal ROW and environmental impacts.

There was consensus to consider a continuous access with limited/restricted access where needed for safety and operations for I-80. The Final Traffic Operations Analysis Report (Caltrans, 2014q) indicated that a limited or restricted access at any location would not be required. With the above findings, a limited-access design alternative for I-80 would not be a viable alternative, and 100 percent continuous access is recommended for the I-80 corridor.

#### 1.4.6 PERMITS AND APPROVALS NEEDED

**Table 1-9** identifies the permits/approvals that would be required for project construction.

**Table 1-9 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 (USFWS)	Biological Opinion	Biological Opinion Issued August 17, 2015
National Marine Fisheries Service (NMFS)	Concurrence with “no effect” determination	Concurred that project is covered under Category 3 of the Programmatic Biological Opinion on May 26, 2015
California Department of Fish and Wildlife	1602 Agreement	Issued during the Final Design Phase
	Incidental Take Permit	Issued during the Final Design Phase
California Water Resources Board	NPDES Permit	Issued during the Final Design Phase
Regional Water Quality Control Board	Section 401 Certification	Issued during the Final Design Phase
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 September 25, 2012/ FHWA Determination September 22, 2015

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 Requested January, 2015 Concurrence Received July 2, 2015

Source: Circlepoint, 2014

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

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As part of the scoping and environmental analysis conducted for the project, several environmental issues were considered but no adverse impacts were identified. The Resource topic with no adverse impacts and reason for no effect are identified in **Table 2-1**. Consequently, there is no further discussion regarding these issues in this document.

**Table 2-1 Issues With No Adverse Impacts**

Resource Topic	Reasons for No Effect
<b>Coastal Zone</b>	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.
<b>Wild and Scenic Rivers</b>	The Build Alternative is not located near any rivers designated as part of the National Wild and Scenic Rivers System. No wild or scenic rivers would be directly or indirectly affected by construction or operation of the Build Alternative.
<b>Energy</b>	The Build Alternative involves no planned use of natural resource beyond fuel and energy needed during construction activities and the power needed to operate the lighting and signage associated with the proposed high occupancy vehicle/express lane (express lane). 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. When balancing energy used during construction and operation against energy saved by relieving traffic congestion and other transportation efficiencies, the Build Alternative would not have substantial energy impacts.

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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, 2014d) and local and regional plans. As part of the CIA, an expansive review of state, regional, and 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:

- *Plan Bay Area*: Includes the Regional Transportation Plan for the nine Bay Area counties; successor to *Regional Transportation Plan (RTP), Transportation 2035 - Change in Motion for the San Francisco Bay Area* <sup>1</sup>
- *Regional Transportation Plan (RTP), Transportation 2035 - Change in Motion for the San Francisco Bay Area*: Transportation plan guiding how transportation funds will be spent in the nine-county Bay Area through horizon year 2035<sup>2</sup>
- *Solano Comprehensive Transportation Plan (CTP)*: Transportation plan which envisions, directs, and prioritizes the transportation needs of Solano County through the year 2030<sup>3</sup>
- *Solano County General Plan*: General Plan for the unincorporated areas of County of Solano through horizon year 2030<sup>4</sup>
- *City of Fairfield General Plan*: General Plan for the City of Fairfield through horizon year 2020<sup>5</sup>
- *City of Vacaville General Plan*<sup>6</sup>: General Plan for the City of Vacaville through horizon year 2010
- *Suisun Valley Strategic Plan*: Strategic Plan for Suisun Valley to provide guidance to the County on its adopted agricultural vision<sup>7</sup>
- *Middle Green Valley Specific Plan*: Specific plan guiding development for largely undeveloped agricultural and open space land in a portion of unincorporated Solano County<sup>8</sup>

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1 Association of Bay Area Governments & Metropolitan Transportation Commission. 2013. Plan Bay Area.

2 Metropolitan Transportation Commission. 2009 .Regional Transportation Plan (RTP), Transportation 2035Change in Motion for the San Francisco Bay Area.

3 Solano County. 2005, updated 2008. Solano Comprehensive Transportation Plan.

4 Solano County. 2008. Solano County General Plan.

5 City of Fairfield. 2002. City of Fairfield General Plan.

6 The City of Vacaville is in the process of preparing a General Plan Update at the time of this document preparation, but has not yet adopted the Update. Therefore, this analysis considers the 2008 General Plan Land Use element as the most recent planning document for the city.

7 Solano County. 2010. Suisun Valley Strategic Plan.

8 Solano County. 2010. Middle Green Valley Specific Plan.

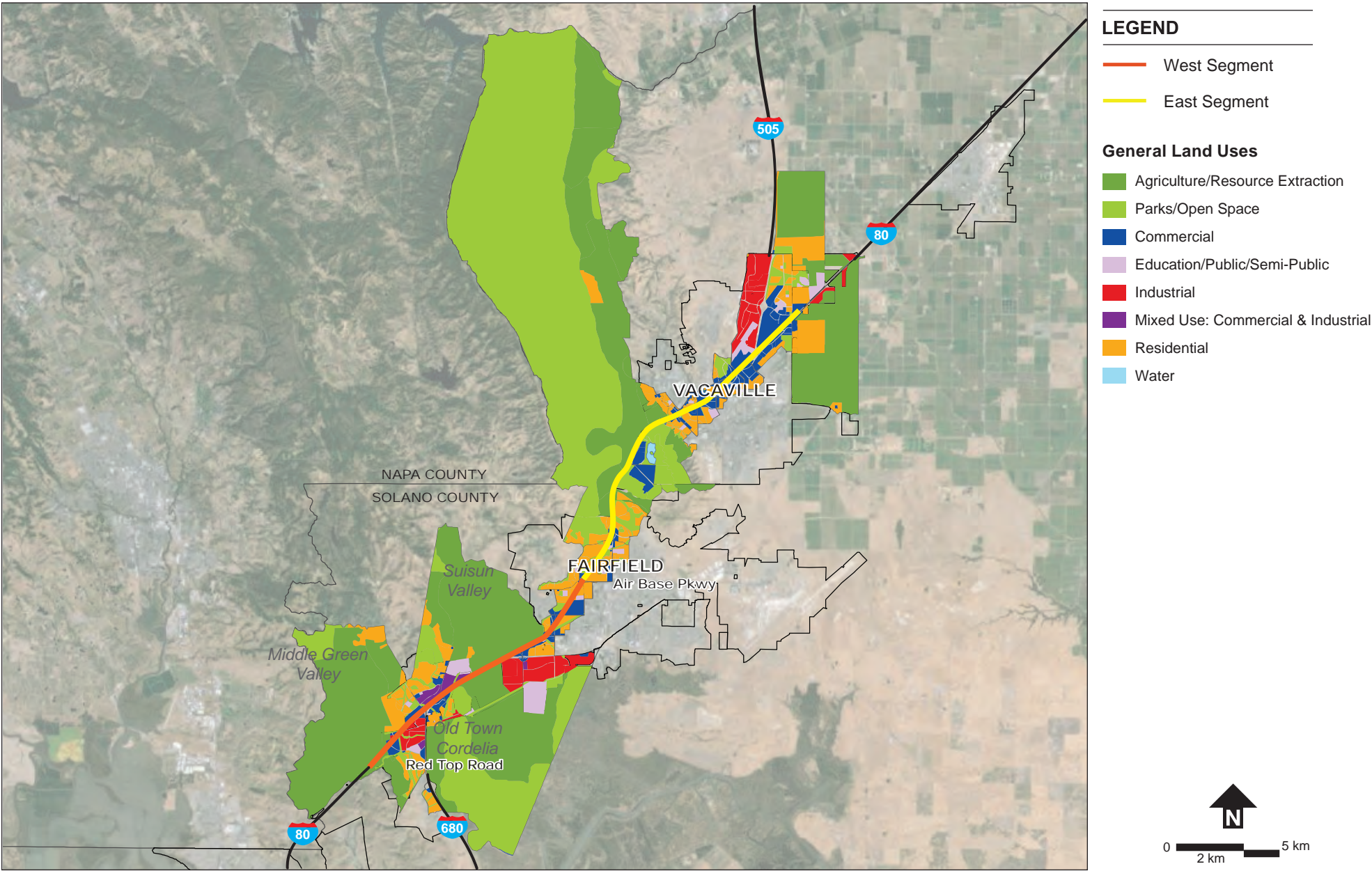
## EXISTING AND FUTURE LAND USE

### Existing Land Use Patterns

The project is located within a region that varies from urban to rural development patterns, with a diverse mixture of land uses that are visibly and functionally divided through the cities of Vacaville, Fairfield, and unincorporated Solano County. The land use study area is shown in **Figure 2.1-1**, which includes the proposed Build Alternative and surrounding land uses. I-80 runs west-east through the study area and serves both local and regional traffic in the area. In the West Segment, from the southern project limit to the SR 12/I-80 interchange, there is a mix of commercial, open space, industrial, agricultural, and residential land uses. From the SR 12/I-80 interchange traveling to the northern limit of the West Segment, land uses consist primarily of residential, with some commercial and open space. From the beginning of the East Segment, to the city limits of Fairfield, land uses consist primarily of residential, with some commercial and agricultural development. Continuing to travel north through unincorporated Solano County, to the southern limits of the City of Vacaville, land uses consist of agricultural, open space, and commercial development. Traveling north, through the City of Vacaville to the northern extent of the East Segment, land uses consist of residential, commercial with some open space, and education/public/semi-public development.

### Planned Development

There are 70 planned developments within the land use study area, which are listed in **Table 2.1-1**. The predominant type of planned development in the study area is residential. Other development projects planned in the study area include several commercial and industrial land uses. Several transportation projects are planned within the study area, including I-80 truck scale relocations in Cordelia; I-80/I-680/SR 12 interchange improvements; SR 12 widening and operation and safety improvements; local roadway widening at Peabody Road, Leisure Town Road, and Foxboro Parkway; roadway extensions at Railroad Avenue and Manual Campos Parkway; and a new rail station at the Capitol Corridor Station. **Section 2.4, Cumulative Impacts** discusses the environmental effects related to the planned developments listed in **Table 2.1-1** and transportation projects noted in conjunction with the proposed project. **Figures 2.4-1a** and **2.4-1b** in **Section 2.4, Cumulative Impacts**, depict the respective locations of these projects.



Land Use Study Area

Figure 2.1-1

Source: Caltrans, 2014d

**Table 2.1-1 Planned Developments**

<b>Name</b>	<b>Location</b>	<b>Acres</b>	<b>Units</b>	<b>Proposed Use</b>	<b>Status</b>
Amber Hills	6928,6932,6950,6964 Browns Valley Road Vacaville	19.1	38	Residential	Tentative Map
Brighton Landing	SE of Elmira Road & Leisure Town Road Vacaville	125	769	Residential	Under Review
Cheyenne	Whispering Ridge Drive & W of Browns Valley Road & N of McMurty Lane Vacaville	86	221	Residential	Partially Constructed
Ivywood	201 Beard Street Vacaville	5.9	37	Residential	Partially Constructed
Knoll Creek	W. of Browns Valley Road & Whispering Ridge Drive Vacaville	10	38	Residential	Approved
Lagoon Valley	E. of I-80; S. of Lagoon Valley Road Vacaville	412	1025	Residential	Tentative Map
Montessa	1222 California Drive Vacaville	40	55	Residential	Tentative Map
Renaissance at North Village	Crescent Drive & North Village Parkway Vacaville	19.8	192	Residential	Under Construction
Casa Bella at North Village	Crescent Drive & North Village Parkway Vacaville	2.9	35	Residential	Under Construction
Sanctuary at North Village	Crescent Drive & North Village Parkway Vacaville	13.4	162	Residential	Under Construction
North Village Unit 5	Crescent Drive & North Village Parkway Vacaville	11	68	Residential	Under Review
North Village Unit 6	W. of North Village Parkway Vacaville	134.9	176	Residential	Under Review
Portofino Unit 2	S. of Tocia Avenue & Butcher Road Vacaville	1.26	7	Residential	Tentative Map

Name	Location	Acres	Units	Proposed Use	Status
Barrington Estates at Southtown	E. of Nut Tree; S. of Somerville Drive Vacaville	43.7	165	Residential	Partially Constructed
Carrington Manor at Southtown	E. of Nut Tree; S. of Somerville Drive	41.9	158	Residential	Partially Constructed
Southtown Phase 3	5709 Vanden Road Vacaville	47.9	37	Residential	Tentative Map
Southtown Commons	E. Side Leisure Town Road; & Cypresswood Drive Vacaville	39.4	215	Residential	Tentative Map
Rancho Rogelio	7019 Browns Valley Road Vacaville	20.9	40	Residential	Tentative Map
Sterling Chateau 4	SE Corner Alamo Vanden Road Vacaville	13.7	54	Residential	Tentative Map
Vanden Meadows	E. of Nut Tree Rd.; S. of Opal Way Vacaville	206	939	Residential	Under Review
Arroyo Vista	SW Corner of Fruitvale Road & Gibson Canyon Road Vacaville	3.87	8	Residential	Tentative Map
Canyon View	Gibson Canyon Road & Vine Court Vacaville	14.08	15	Residential	Approved Vesting
Cheyenne Estates	NW of Shelton Lane Vacaville	15	15	Residential	Approved Final Map
Gibson/Vine Estates	SE Corner of Gibson Canyon Road/Vine Street Vacaville	9.01	8	Residential	Approved Vesting
Golf Course Estates	White Sands Drive & Whitney Court Vacaville	16.8	3	Residential	Recorded Final Map
Hidden Valley	N. Alamo Drive & Hidden Valley Lane Vacaville	25.5	31	Residential	Recorded Final Map
Horkey Parcel Map	385 Vine Street Vacaville	3.5	2	Residential	Tentative Map

Name	Location	Acres	Units	Proposed Use	Status
Nob Hill Estates	End of Seneca Way Vacaville	12.17	9	Residential	Approved Final Map
North Vine Street Estates	N. end of Vine St.; E. of Gibson Canyon Road Vacaville	60.4	58	Residential	Approved Final Map
Rogers Ranch	N. of McMurtry Lane & Grace Feather Court Vacaville	35	28	Residential	Vesting Tentative Map
Spring Lane Unit 2	Spring Lane & Monte Verde Drive Vacaville	52.85	27	Residential	Tentative Map
Stratton Estates	607 Shady Glen Road Vacaville	4	10	Residential	Partially Constructed
Verona	190 Rice Lane Vacaville	4.72	4	Residential	Tentative Map
Villages on Vine Unit 2	E. of Vine Street & Gibson Canyon Road Vacaville	12.9	25	Residential	Under Construction
Vine Glen Estates	Bresee Ave/Vine Street Vacaville	6.3	19	Residential	Tentative Map
Nut Tree Apartments	Nut Tree Road & E Monte Vista Ave Vacaville	12	216	Residential	Approved
Quinn Crossing Apartments	9999 Quinn Road Vacaville	17.3	312	Residential	Pending Submittal
Southtown Apartments	W. of Leisure Town Road & Vanden Road Vacaville	10.7	223	Residential	Tentative Map
Southtown Townhouses	W. Side Vanden Road & Cogburn Circle Vacaville	6.3	60	Residential	Tentative Map
Vanden Meadows Apartments	W. of Vanden Road; N. of Newcastle Drive Vacaville	8.17	60	Residential	Approved Planned Developmen t
Villas at North Village Apartments	North Village Parkway & Crescent Drive Vacaville	9.9	228	Residential	Approved

Name	Location	Acres	Units	Proposed Use	Status
Eastridge	Green Valley Road & Eastridge Drive Fairfield	N/A	217	Residential	Active
Garibaldi Ranch	Lopes Road & Gold Hill Road Fairfield	N/A	520	Residential	Active
Gold Ridge	Peabody Road & Chuck Hammond Drive Fairfield	N/A	1458	Residential	Active
Madison	Peabody Road & Gramercy Circle Fairfield	N/A	221	Residential	Active
Paradise Crest	Manuel Campos Parkway & Mystic Drive Fairfield	N/A	150	Residential	Active
Fieldcrest	Red Top Road & Oakbrook Drive Fairfield	N/A	384	Residential	Future
Train Station Specific Plan Area	Peabody Road & Cement Hill Road Fairfield	N/A	N/A	Residential	Future
Villages at Fairfield	Cement Hill Road & Walters Road Fairfield	N/A	1717-2159	Residential	Future
Villas at Havenhill	Red Top Road & Oakbrook Drive Fairfield	N/A	324	Residential	Future
Franklin-Tabor	Tabor Avenue & Pacific Avenue Fairfield	N/A	23	Residential	Inactive
Ivy Wreath	East Tabor Avenue & Walters Road Fairfield	N/A	73	Residential	Inactive
Paesino Verde	Business Center Drive & Suisun Valley Road Fairfield	N/A	284	Residential	Inactive
Strawberry Fields	East Tabor Avenue & Walters Road Fairfield	N/A	39	Residential	Inactive

Name	Location	Acres	Units	Proposed Use	Status
The Cottages	Union Avenue & Peach Tree Drive Fairfield	N/A	45	Residential	Inactive
Mercedes Benz	2950 Auto Mall Fairfield	77,914 square feet		Commercial	Under Construction
Lowes	N. Texas at Manuel Campos Fairfield	139,000 square feet		Commercial	Under Construction
Premium Auto Mall	Auto Plaza Court Fairfield	10,000 +/- square feet		Commercial	Under Construction
Sparkles Express Car Wash	3103 N. Texas Fairfield	3,000 square feet		Commercial	Approved
Laurel Creek Plaza	Air Base at Claybank Fairfield	110,186 square feet		Commercial	Approved
Green Valley Ranch	4455 Central Fairfield	N/A		Commercial	Future Phase
CarMax	2901/2955 Auto Mall Parkway Fairfield	64,000 square feet		Commercial	Approved. Awaiting Building Permit
Green Valley Plaza	200 Suisun Valley Road Fairfield	455,000 square feet		Commercial	Application Under Review
Frank Lin Distillers	2455 Huntington Drive Fairfield	N/A		Industrial	Completed
Verizon MSC	2555 N. Watney Way Fairfield	49,235 square feet		Industrial	Under Construction
Clorox Tank Farm 1 & 2	2600 Huntington Drive Fairfield	N/A		Industrial	Under Construction
Lincoln Cordelia Road	2901 Cordelia Road Fairfield	119,000 square feet		Industrial	Time Extension Field
Lopes-Fermi Industrial Flex Building	555 Lopes Road Fairfield	32,509 square feet		Industrial	Time Extension Field
JCM Industrial Park	Cordelia Road at Hale Ranch Road Fairfield	841,000 square feet		Industrial	On Hold

Source: Caltrans, 2014d



## 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.

### **Regional Transportation Plans and 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 significant physical, environmental, or financial challenges.

In 2013, the MTC adopted the RTP, Plan 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 2013 RTP identifies I-80 as a priority corridor and includes the West Segment portion of the project as part of the larger MTC Regional Express Lanes System.

In November 2009, the I-80 HOV Lane Project from Red Top Road to Air Base Parkway, in the City of Fairfield, was completed. The project widened the existing I-80 median to add over 8 miles of HOV lanes in both directions and constructed new concrete median barrier. The West Segment of this project will convert these HOV lanes to express lanes.

STA started preliminary studies for the conversion (West Segment) and widening (East Segment) segments of the project in 2010. STA is the lead agency responsible for planning, design and construction of the express lanes on I-80 in Solano County.

On September 28, 2011, the MTC submitted the Bay Area Express Lanes Public Partnership Application for High Occupancy Toll Lanes to the California Transportation Commission (CTC). The application, submitted in cooperation with Caltrans, requests authority, pursuant to Section 149.7 of the Streets and Highways Code, to develop and implement 285 miles of express lanes within the Bay Area. The application was approved in October 2011 and included the approved program-level Project Study Report (PSR) To Support the Bay Area Express Lane Backbone Network. One of the two alternatives developed in the PSR is comparable to this project.

The project is therefore consistent with the MTC Plan Bay Area, and is an element of MTC's 533-mile "backbone" network for express lanes in the San Francisco Bay Area, as described in MTC's Express Lane Backbone Network PSR (RTP ID 240581 and 230660).

The project is included in the MTC's 2015 Transportation Improvement Program (TIP) as project number SOL110001.<sup>9</sup> MTC approved the financially constrained TIP through Amendment No. 2013-16 on May 28, 2014. The Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) approved and incorporated the TIP into the Federal Statewide Transportation Improvement Program (FSTIP) on June 12, 2014.

*Solano County Transportation Authority (STA) Comprehensive Transportation Plan 2030*

The STA's Comprehensive Transportation Plan (CTP 2030) for Solano County envisions, directs, and prioritizes the transportation needs of Solano County through the year 2030. The plan identifies HOV lane construction on the I-80 corridor within the county.<sup>10</sup> Additionally, express lanes on I-80 are identified as an operational strategy to implement the identified needs as outlined in the I-80/I-680/I-780 Major Investment & Corridor Study prepared for the STA.

### **Conservation Plans**

*Proposed Solano Habitat Conservation Plan (HCP)*

The purpose of the Solano HCP is to establish a framework for complying with state and federal endangered species regulations while accommodating future urban growth, including the development of public infrastructure over the next 30 years for participating agencies. Although the project is within the HCP limits, Caltrans is not a participant in the proposed Solano HCP nor is the document binding, or formally adopted. However, avoiding conflict with adopted habitat conservation plans and local ordinances are goals of NEPA and CEQA. The goals of the Solano HCP were shaped by many of the same environmental regulations that have influenced this project. Where applicable, the avoidance and minimization measures devised to reduce the adverse impacts of this project to special status resources have been crafted to complement those avoidance and minimization measures listed in the Solano HCP.

### **General and Specific Plans**

*Solano County General Plan*

The Transportation and Circulation Element of the Solano County General Plan provides the following goal and policies for transportation and circulation within the county<sup>11</sup>:

*Goal TC.G-2:* Promote coordinated approaches to creating, maintaining and improving transportation corridors and facilities by working with other jurisdictions and transportation agencies in funding and implementing projects.

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<sup>9</sup> The project was originally listed under the two TIP numbers SOL110001 and SOL110002 (relative to the East and West Segments). TIP Amendment No. 2013-16 combined the two segments under one TIP ID SOL110001, and reprogrammed the funding sources and phases.

<sup>10</sup> Solano Transportation Authority Comprehensive Transportation Plan 2005, updates 2009; <  
<http://www.sta.ca.gov/Content/10054/ComprehensivePlans.html#ahf>>accessed on March 10, 2013.

<sup>11</sup> Solano County. 2005. Solano County General Plan, pg LU-31

*Policy TC.P-1:* Maintain and improve current transportation systems to remedy safety and congestion issues, and establish specific actions to address these issues when they occur.

*Policy TC.P-11:* Maintain and improve the current roadways and highway system to meet recommended design standards set forth by the County, including streets that also carry transit and non-motorized traffic.

#### *City of Vacaville General Plan*

The project limits are located, in part, within the City of Vacaville. The Land Use, Open Space and Transportation Elements of the City of Vacaville's General Plan include the following guiding policies related to transportation and circulation within the city

*Policy 2.2-G 5:* Plan for and carry out improvements to the City's infrastructure, consistent with the General Plan, to preserve economic vitality, accommodate new housing, increase the City's revenue base, enhance mobility and economic opportunity, and correct deficiencies.

*Policy 6.2-G 1:* Work with the California Department of Transportation (Caltrans) and Solano Transportation Authority (STA) to achieve timely construction of programmed freeway and interchange improvements.

*Policy 6.2-G 2:* Coordinate, to the extent feasible, transportation system improvements with neighboring jurisdictions.

*Policy 6.2-I 3:* Encourage Caltrans to widen and upgrade I-80 through Vacaville. In new development areas adjoining I-80 and I-505, require major building setbacks and require offers-of-dedication to permit the long-term planning and widening of the freeways.

#### *City of Fairfield General Plan*

The project limits are located, in part, within the City of Fairfield. The Circulation Element of the City of Fairfield's General Plan includes the following guiding policies related transportation and circulation within the city.

*Policy CI 2.3:* Work with Caltrans to identify needed improvements to its highway/interstate facilities in the City and implement necessary programs on the state highway system and its interchanges/intersections with local roadways.

*Policy CI 2.4:* Work with Caltrans and adjacent jurisdictions to improve the operational performance of I-80, I-680 and State Route 12 as regional facilities.

## ENVIRONMENTAL CONSEQUENCES

### **Build Alternative**

**Table 2.1-2** 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 West Segment are identified.

**Table 2.1-2 Consistency with State, Regional, and Local Plans and Programs**

<b>Policy</b>	<b>Build Alternative</b>	<b>No-Build Alternative</b>
<b><i>Plan Bay Area / Change in Motion: Transportation 2035</i></b>		
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 express lane, which would reduce traffic congestion and optimize roadway capacity. As a result, this segment of I-80 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 this segment of I-80 into the regional Bay Area Express Lane Network.
<b><i>Solano Comprehensive Transportation Plan 2030</i></b>		
HOV lane construction on the I-80 corridor is an identified need of Solano County.	Consistent The Build Alternative would provide new express lanes within the East Segment, which is an operational strategy to meet identified traffic and circulation deficiencies.	Not Consistent Under the No-Build Alternative, no changes to the existing roadways would occur within the project limits, and no new HOV lanes would be constructed.
Express lanes on I-80 are identified as an operational strategy to implement the identified needs as outlined in the I-80/I-680/I-780 Major Investment & Corridor Study.	Consistent The Build Alternative would provide an express lane, which is an operational strategy to meet identified traffic and circulation deficiencies.	Not Consistent Under the No-Build Alternative, no changes to the existing roadways would occur within the project limits, and no express lanes would be constructed.
<b><i>Proposed Solano County Water Authority Habitat Conservation Plan (HCP)</i></b>		
Comply with state and federal endangered species regulations while accommodating future development of infrastructure.	Consistent Implementation of avoidance, minimization, and/or mitigations provided in <b>Section 2.3, Biological Environment</b> would ensure adherence to federal and endangered species regulations.	Consistent Under the No-Build Alternative, no improvements to existing conditions would occur within the project limits and no federal or endangered species would be impacted.
<b><i>Solano County General Plan</i></b>		
<b>Goal TC.G-2:</b> Promote coordinated approaches to creating, maintaining and improving transportation corridors and facilities by working with other jurisdictions and transportation agencies in funding and implementing projects.	Consistent Caltrans, in cooperation with the Solano Transportation Authority (STA), would implement the Build Alternative to improve the I-80 corridor. The Build Alternative would be funded from federal, state, and regional sources.	Not Consistent Under the No-Build Alternative, no improvements to the I-80 corridor would be constructed and future traffic volumes would further degrade freeway operations.

<b>Policy</b>	<b>Build Alternative</b>	<b>No-Build Alternative</b>
<i>Policy TC.P-1:</i> Maintain and improve current transportation systems to remedy safety and congestion issues, and establish specific actions to address these issues when they occur.	Consistent The Build Alternative would construct express lanes to address existing deficiencies on I-80 that hinder the safe and efficient movement of traffic.	Not Consistent Under the No-Build Alternative, no improvements would occur to the current transportation system, and safety and congestion issues would not be remedied.
<i>Policy TC.P-11:</i> Maintain and improve the current roadways and highway system to meet recommended design standards set forth by the County, including streets that also carry transit and non-motorized traffic.	Consistent During the design phase, the Build Alternative would be designed to meet industry standards.	Not Consistent Under the No-Build Alternative, no improvements to the current highway system would be constructed and existing design deficiencies would remain.
<b>City of Vacaville General Plan</b>		
<i>Policy 2.2-G 5:</i> Plan for and carry out improvements to the City's infrastructure, consistent with the General Plan, to preserve economic vitality, accommodate new housing, increase the City's revenue base, enhance mobility and economic opportunity, and correct deficiencies.	Consistent The Build Alternative would carry out improvements to the segment of the I-80 corridor within the City of Vacaville, correcting existing design deficiencies and enhancing mobility in the area.	Not Consistent Under the No-Build Alternative, no improvements to the I-80 corridor through the City of Vacaville would be constructed, and existing design deficiencies would remain.
<i>Policy 6.2-G 1:</i> Work with the California Department of Transportation (Caltrans) and Solano Transportation Authority (STA) to achieve timely construction of programmed freeway and interchange improvements.	Consistent The Build Alternative would construct express lanes programmed in State and Regional planning documents.	Not Consistent Under the No-Build Alternative, no construction of programmed improvements to the I-80 freeway would occur.
<i>Policy 6.2-G 2:</i> Coordinate, to the extent feasible, transportation system improvements with neighboring jurisdictions.	Consistent Development of the Build Alternative involves coordination with the neighboring jurisdictions of Fairfield and Solano County.	Not Consistent Under the No-Build Alternative, no construction of programmed improvements to the I-80 freeway would occur.
<i>Policy 6.2-I 3:</i> Encourage Caltrans to widen and upgrade I-80 through Vacaville. In new development areas adjoining I-80 and I-505, require major building setbacks and require offers-of-dedication to permit the long-term planning and widening of the freeways.	Consistent The segment of the Build Alternative that travels through Vacaville would be widened to accommodate new express lanes in both the eastbound and westbound directions of I-80.	Not Consistent Under the No-Build Alternative, no construction of programmed improvements to the I-80 freeway would occur.

Policy	Build Alternative	No-Build Alternative
<b>City of Fairfield General Plan</b>		
<i>Policy CI 2.3:</i> Work with Caltrans to identify needed improvements to its highway/interstate facilities in the City and implement necessary programs on the state highway system and its interchanges/intersections with local roadways.	Consistent The Build Alternative would construct express lanes on I-80, from west of Red Top Road to east of I-505, enhancing mobility in the area.	Not Consistent Under the No-Build Alternative, no upgrades to I-80 would occur.
<i>Policy CI 2.4:</i> Work with Caltrans and adjacent jurisdictions to improve the operational performance of I-80, I-680 and State Route 12 as regional facilities.	Consistent The Build Alternative would construct express lanes on I-80, from west of Red Top Road to east of I-505, enhancing mobility in the area.	Not Consistent Under the No-Build Alternative, no upgrades to I-80 would occur.

Sources: Caltrans, 2014d, County of Solano General Plan 2004, City of Vacaville General Plan, 2007; City of Fairfield General Plan, 2002, Google Maps

The MTC completed the program-level Project Study Report (PSR) *To Support the Bay Area Express Lane Backbone Network* in September 2011 and includes the development and implementation of 285 miles of express lanes within the Bay Area. One of the two alternatives developed in the PSR is comparable to this project.

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.

#### *West Segment - Fundable First Phase*

The West Segment is consistent with the plans, policies, and programs discussed above and outlined in **Table 2.1-2**.

#### *No Build Alternative*

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lanes would be constructed. As such, the No-Build Alternative is generally not consistent with the applicable local or regional planning documents described above in **Table 2.1-2**, which generally call for improvements to the state highway system.

### AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

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

## 2.1.2 PARKS AND RECREATION FACILITIES

### AFFECTED ENVIRONMENT

Information in this section is based on the CIA prepared for the project (Caltrans, 2014d). There are 42 parks and recreational facilities within 0.5 miles from the proposed Build Alternative improvements (see **Table 2.1-3** and **Figures 2.1-2a and 2.2-2b**). Few of these facilities are located immediately adjacent to the I-80 corridor. The Lagoon Valley Park/Pena Adobe Park and the Fairfield Linear Park Trail are closest to the I-80 corridor. The Lagoon Valley Park/Pena Adobe Park is located adjacent to the I-80 corridor, directly south of the Rivera Road/I-80 interchange in the East Segment. The park includes the historic Pena Adobe home, barbeque areas, multi-purpose fields, bike trails, and hiking trails.

Fairfield Linear Park is a Class I mixed-use/bicycle path and is located adjacent to the I-80 corridor in the West Segment from the I-80/SR 12 interchange to Rockville Road.<sup>12,13</sup> The park is a multi-use facility that provides opportunities for both active and passive outdoor recreation. Some of the more common activities that occur at the park include jogging, biking, and walking, all of which mostly take place on a concrete/asphalt path that spans the entire distance between the park's termini. The Fairfield City Council amended the General Plan designation of a portion of the Fairfield Linear Park Trail between Abernathy Road and Solano Community College (within the West Segment) from open space recreation (OSR) to public facility (PF) on September 16, 2008. As a result of the change in designation, an approximately 2-mile long segment of the Fairfield Linear Park was realigned as part of the North Connector Project (the Suisun Parkway Project). The realigned multi-use bike trail connects with the existing portions of the Fairfield Linear Park Trail at Suisun Creek to the west and at Abernathy Road to the east. This segment of the trail is between approximately 250 to 500 feet from I-80.

In addition, bike paths and bike lanes are present at several cross-street locations that intersect with the I-80 ramp termini within the project limits. Bike path (Class 1) and bike lane (Class 2, on-street striped bike lanes) intersections occur at Leisure Town Road, Nut Tree Road, Allison Drive, Elmira Road, Air Base Parkway/Waterman Boulevard, and Oliver Road. The Southside Bikeway begins at California Drive in the City of Vacaville, east of I-80. It travels northwest, and ends at Davis Street just before it reaches I-80. The Butcher Road Bike Path begins at Butcher Road on the east side of I-80, and travels south to its terminus at Pena Adobe Regional Park. A Class I bike path connects Nelson Road to Paradise Valley Road along the east side of I-80 in Fairfield.

<sup>12</sup> A Class I path is a paved right-of-way completely separated from streets. These paths are typically shared between bicycles and pedestrians and are for mixed-uses.

<sup>13</sup> Exhibit C1-2, Fairfield Circulation Element.

**Table 2.1-3 Parks and Recreational Facilities**

#	Name	Address
<b>Vacaville</b>		
1	Alamo Creek Park	Alamo Drive, Vacaville, CA 95688
2	Alamo School Park <sup>1</sup>	535 Edgewood Drive, Vacaville, CA 95688
3	Andrews Park <sup>1</sup>	Monte Vista Avenue and School St., Vacaville, CA 95688
4	Arbor Oaks Park	842 Arbor Oaks Drive, Vacaville, CA 95687
5	Centennial Park	270 Browns Valley Parkway, Vacaville, CA 95688
6	City Hall Park <sup>1</sup>	Walnut Avenue, Vacaville, CA 95688
7	Fairmont School Park	528 Tulare Drive, Vacaville, CA 95687
8	Fairmont/Beelard Park	1355 Marshall Road, Vacaville, CA 95687
9	Hawkins Park	300 Summerfield Drive, Vacaville, CA 95687
10	Hemlock School Park	498 Hemlock Street, Vacaville, CA 95688
11	Irene Larsen Park	1800 Alamo Drive, Vacaville, CA 95687
12	Keating Park	California Drive and Alamo Lane, Vacaville, CA 95688
13	Lagoon Valley Park/Pena Adobe Park <sup>1</sup>	1 Pena Adobe Road, Vacaville, CA 95688
14	McBride Senior Center	91 Town Square Place, Vacaville, CA 95688
15	Nelson Park	Nut Tree and Marshall Road, Vacaville, CA 95688
16	North Orchard Park <sup>1</sup>	N. Orchard Avenue and Crestview Drive, Vacaville, CA 95688
17	Padan Park	251 Padan School Road, Vacaville, CA 95687
18	Patwin Park	Elmira Road and Alamo Creek Bike Trail, Vacaville, CA 95867
19	Senior Center Park <sup>1</sup>	Ulati Creek, Vacaville, CA 95688
20	Three Oaks Community Center <sup>1</sup>	1100 Alamo Drive, Vacaville, CA 95688
21	Trower Park	531 Markham Avenue, Vacaville, CA 95688
22	Ulati Community Center <sup>1</sup>	1000 Ulati Drive, Vacaville, CA 95688
23	Ulati Gardens <sup>1</sup>	1000 Ulati Drive, Vacaville, CA 95688
24	Willows Park <sup>1</sup>	Ogden Way and Marshall Road, Vacaville, CA 95687
<b>Fairfield</b>		
25	Allan Witt Community Park	1741 West Texas Street, Fairfield, CA 94533
26	City Hall & Civic Center Park	Civic Center Drive, Fairfield, CA 94533
27	Cordelia Community Park	1300 Gold Hill Road, Fairfield, CA 94533
28	Dunnell Property (project under design) <sup>1</sup>	3351 Hilborn Road, Fairfield, CA 94533
29	Hayes & Utah Street ~ Tot Lot <sup>1</sup>	1101 Hayes Street, Fairfield, CA 94533
30	Hillview Neighborhood Park <sup>1</sup>	300 Atlantic Avenue, Fairfield, CA 94533



#	Name	Address
31	Kentucky Street ~ Tot Lot <sup>1</sup>	1740 Kentucky Street, Fairfield, CA 94533
32	Linear Park Playground @ 2 <sup>nd</sup> Street <sup>1</sup>	2nd St. & Linear Trail, Fairfield, CA 94533
33	Linear Park Playground @ 5th Street <sup>1</sup>	5th St. & Linear Trail, Fairfield, CA 94533
34	Mankas Neighborhood Park <sup>1</sup>	2800 Owens Street, Fairfield, CA 94533
35	Meadow Glen Neighborhood Park <sup>1</sup>	2800 Parkview Terrace, Fairfield, CA 94533
36	Meadow Neighborhood Park	1520 Meadowlark Drive, Fairfield, CA 94533
37	Rolling Hills Neighborhood Park	3520 Glenwood Drive, Fairfield, CA 94533
38	Rose Garden @ Linear Trail Park <sup>1</sup>	Travis Boulevard & Linear Trail, Fairfield, CA 94533
39	Sunrise Neighborhood Park	2920 Camrose Avenue, Fairfield, CA 94533
40	Veterans Memorial Park <sup>1</sup>	2050 Fairfield Avenue, Fairfield, CA 94533
41	Vintage Green Valley Neighborhood Park <sup>1</sup>	600 Vintage Valley Drive, Fairfield, CA 94533
42	Woodcreek Neighborhood Park <sup>1</sup>	1470 Astoria Drive, Fairfield, CA 94533

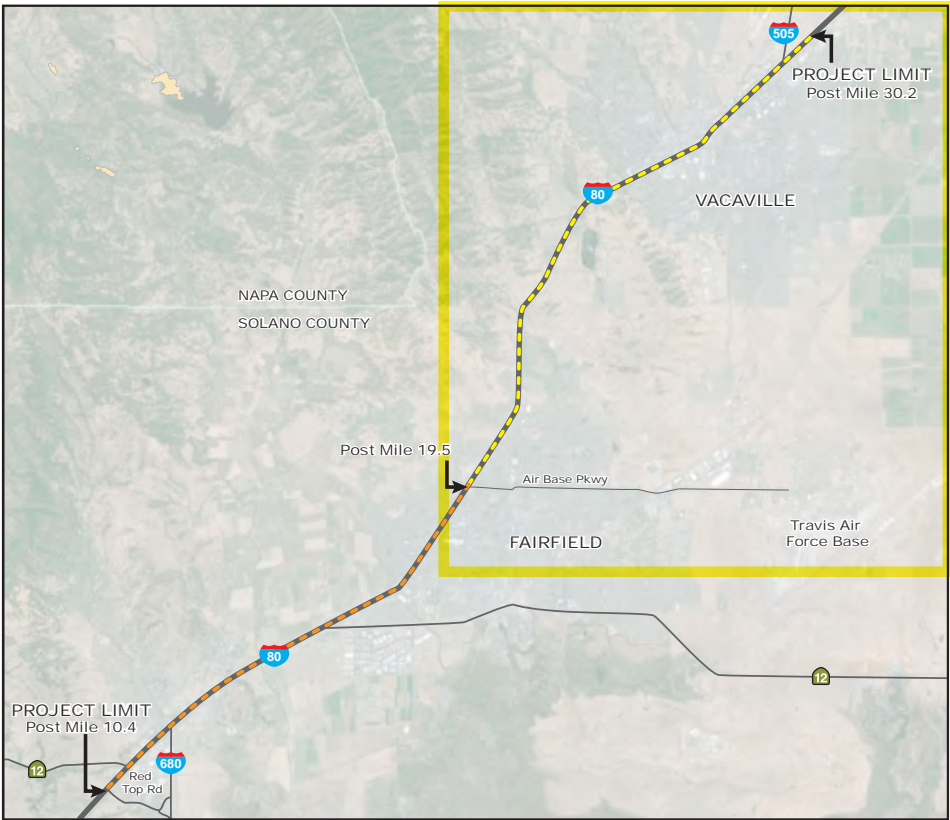
Note<sup>1</sup>: 4(f) properties, discussed in detail in **Appendix B**.  
Source: Caltrans, 2014d

## ENVIRONMENTAL CONSEQUENCES

### Build Alternative

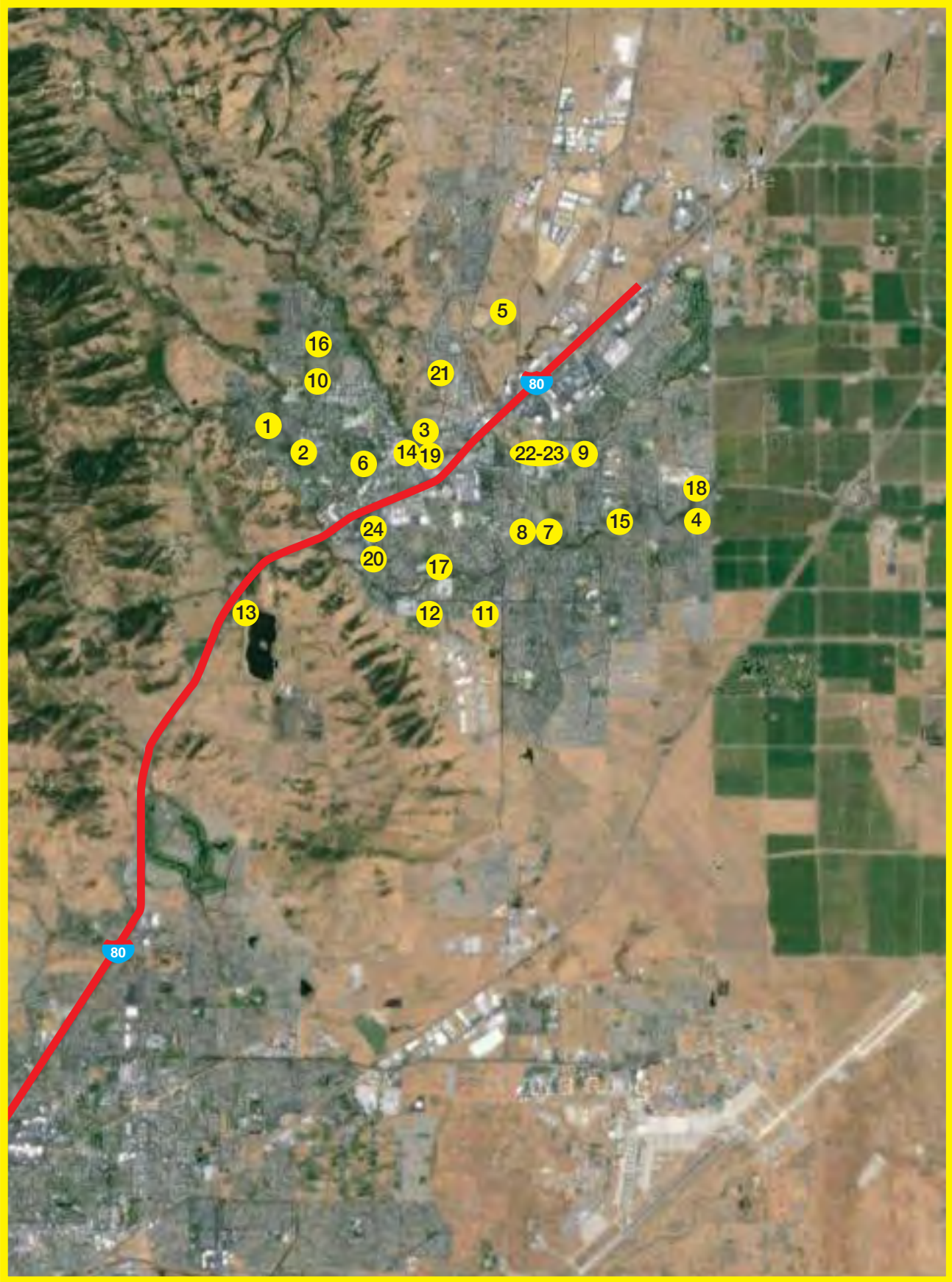
Property of the nearby parks and recreational facilities identified in **Table 2.1-3** would not be acquired as part of the Build Alternative, thereby avoiding direct effects. Since the Build Alternative would not substantially alter the location of I-80, the distance between the parks and recreational facilities and the freeway corridor will not change when compared to existing conditions. The bike paths and bike lanes located adjacent to I-80, and at the various ramp termini intersections, would remain open during construction and would not be impacted as part of the Build Alternative. As part of the North Connector Project, the segment of the trail between Abernathy Road/I-80 interchange and Suisun Creek was realigned adjacent to the new Suisun Valley Parkway, approximately 250 to 500 feet north of the I-80 corridor. The new alignment would not overlap or preclude the proposed improvement areas of the project. The Build Alternative proposes roadway grading and widening at approximately 300 to 450 feet north of the Lagoon Valley Park/Pena Adobe Park. These improvements would occur within the Caltrans right-of-way and would be far enough away from these parks and recreational facilities that there would be no permanent effects.

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**Legend**

— Project Study Limits

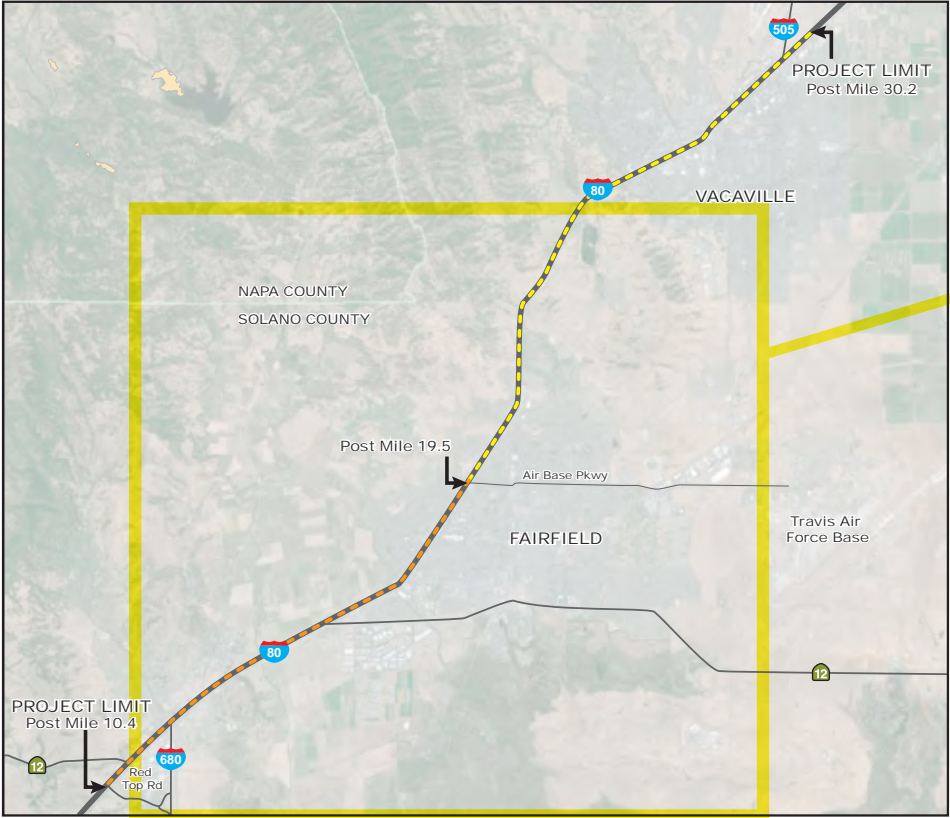


**VACAVILLE PARKS AND RECREATIONS**

- 1 Alamo Creek Park
- 2 Alamo School Park
- 3 Andrews Park
- 4 Arbor Oaks Park
- 5 Centennial Park
- 6 City Hall Park
- 7 Fairmont School Park
- 8 Fairmont/Beelard Park
- 9 Hawkins Park
- 10 Hemlock School Park
- 11 Irene Larsen Park
- 12 Keating Park
- 13 Lagoon Valley Park/Pena Adobe Park
- 14 McBride Senior Center
- 15 Nelson Park
- 16 North Orchard Park
- 17 Padan Park
- 18 Patwin Park
- 19 Senior Center Park
- 20 Three Oaks Community Center
- 21 Trower Park
- 22 Ulati Community Center
- 23 Ulati Gardens
- 24 Willows Park

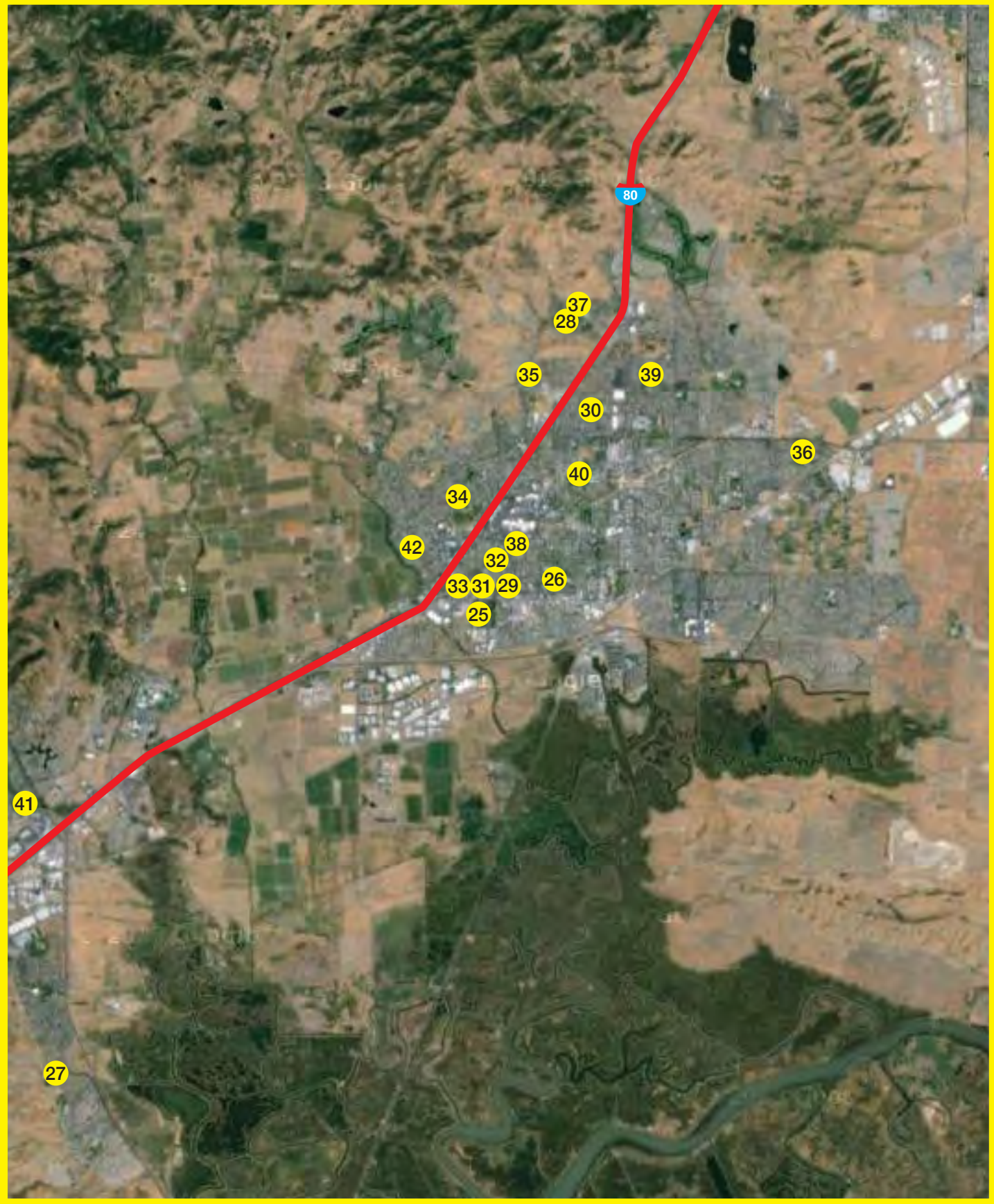
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**Legend**

— Project Study Limits



**FAIRFIELD PARKS & RECREATION**

- 25 Allan Witt Community Park
- 26 City Hall & Civic Center Park
- 27 Cordelia Community Park
- 28 Dunnell Property (project under design)
- 29 Hayes & Utah Street ~ Tot Lot
- 30 Hillview Neighborhood Park
- 31 Kentucky Street ~ Tot Lot
- 32 Linear Park Playground @ 2nd Street
- 33 Linear Park Playground @ 5th Street
- 34 Mankas Neighborhood Park
- 35 Meadow Glen Neighborhood Park
- 36 Meadow Neighborhood Park
- 37 Rolling Hills Neighborhood Park
- 38 Rose Garden @ Linear Trail Park
- 39 Sunrise Neighborhood Park
- 40 Veterans Memorial Park
- 41 Vintage Green Valley Neighborhood Park
- 42 Woodcreek Neighborhood Park

Back of Figure 2.1-2b

The Build Alternative would not result in an increase in population in the areas surrounding the I-80 corridor (see **Section 2.1.3, Growth**); therefore, additional demand on the parks and recreational facilities is not anticipated. Potential air quality impacts are discussed in **Section 2.2.6, Air Quality**, which concludes that implementation of construction period minimization measures will reduce any air quality impacts resulting from construction activities. 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 that warrant preservation, are protected. These resources are further discussed in **Section 2.1.9, Cultural Resources**, and **Appendix B**.

#### **West Segment – Fundable First Phase**

As with the Build Alternative, the West Segment would not impact any park facilities. **Table 2.1-3** identifies the parks that are within 0.5-mile of the West Segment of the Build Alternative. The Build Alternative, including the West Segment, 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 provision includes a requirement to examine indirect consequences, 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, 2014d). The study area for the growth impacts discussion is defined by the census tract blocks that encompass or are adjacent to the I-80 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 Build Alternative.

### Population and Housing Trends in the Study Area

The study area for growth impacts has experienced stable development over the past several years. 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-80 corridor (see **Table 2.1-1**). **Table 2.1-4** summarizes existing and projected population and housing growth through 2040 for the county of Solano, cities of Vacaville and Fairfield, as well as the regional Bay Area.<sup>14</sup>

**Table 2.1-4 2010-2040 Population and Household Growth**

Geographic Area	Population			Households		
	2010	2040	Percent Change	2010	2040	Percent Change
Bay Area	7,150,739	9,299,100	30%	2,608,023	3,308,090	27%
Solano County	413,344	511,600	24%	141,758	168,700	19%
City of Vacaville	92,428	114,000	23%	31,092	35,860	15%
City of Fairfield	105,321	146,500	39%	34,484	46,430	35%

Source: Association of Bay Area Governments (ABAG), Projections 2013

To accompany the increased population described above, housing is also expected to grow rapidly in the study area. According to the 2013 ABAG Projections, the following gains are expected in total households by 2040:

- County of Solano – 26,942 additional households (27 percent increase)
- City of Vacaville – 4,768 additional households (19 percent increase)
- City of Fairfield – 11,946 additional households (35 percent increase)

<sup>14</sup> 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.



## Employment Trends in the Study Area

Employment throughout the Bay Area region declined during the recent economic downturn. However, employment growth is expected substantially grow over the next two decades, with a 18.0 percent increase in the region between 2010 and 2040. In particular, both Vacaville and Fairfield are two of the three cities in Solano County which will accommodate the most absolute number of jobs, together accounting for 77 percent of the county's projected growth. Throughout Solano County, the construction sector is projected to see the most percentage growth in employment, while nearly half the new jobs will be in the health and educational and professional management services<sup>15</sup>. Employment (job) trends and projections for Solano County, the City of Vacaville, and the City of Fairfield are shown in **Table 2.1-5**.

**Table 2.1-5 2010-2040 Employment Growth**

Geographic Area	Employment (Jobs)		
	2010	2040	% Change Between 2010 and 2040
Solano County	132,340	179,940	+36%
City of Vacaville	29,800	41,120	+38%
City of Fairfield	39,300	53,310	+36%

Source: Association of Bay Area Governments (ABAG), Projections 2013

## 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. 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

The purpose of the Build Alternative is to provide an immediate benefit to the traveling public by offering non-carpool eligible drivers a reliable travel time option, improving public transit utilization, increasing vehicle and passenger throughput, maximizing the use of the existing freeway infrastructure, relieving traffic congestion, and improving traffic flow on the regional highway network. The Build Alternative would optimize the under-utilized capacity in the existing HOV lane in the West Segment, as well as add capacity, through construction of new express lanes in the East Segment. By implementing these improvements, the Build Alternative would, to some extent, accommodate growth on a regional level.

<sup>15</sup> According to ABAG Projections 2013.

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., Solano County and cities of Vacaville and Fairfield General Plans). The surrounding areas are largely built out, and the majority of future development will generally involve redevelopment of existing areas or infill within urbanized areas (see **Section 2.1.1, Land Use**).

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-80, 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. The existing eastbound Travis Boulevard off-ramp would be modified into two separate off-ramps to accommodate increased weaving length for the auxiliary lane extension. Other off-ramp modifications involve reconstruction of existing ramps. These improvements do not constitute changes in the existing access points to the areas surrounding the project limits. 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 Solano County, and would therefore not have a substantial effect on growth. As 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.

### **West Segment –Fundable First Phase**

As in the Build Alternative, West Segment would, to some extent, accommodate growth on a regional level by improving access and highway capacity. By the year 2040, the conversion of the HOV lane to an express lane would lead to a 9 percent increase in the number of vehicles using the express lane, thereby decreasing the congestion in the general purpose lanes. The West Segment 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 the West Segment is already planned for and forecasted in land use regulating documents (i.e., county of Solano and cities of Vacaville and Fairfield General Plans). The West Segment 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. The West Segment would not induce growth beyond forecasted development in Solano County, and would therefore not have a substantial effect on growth. Because potential indirect growth resulting from the West Segment 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 County of Solano, the City of Vacaville and the City of Fairfield.

### 2.1.4 FARMLANDS/TIMBERLANDS

#### 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 Federal Highway Administration (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. The federal process for assessing farmland impacts is guided by the provisions of the Farmland Protection Policy Act, which calls for completion of Form NRCS-CPA-106.

The California Environmental Quality Act (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, CEQA Evaluation** of this environmental document.

The California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) keeps 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 Important 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, 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.

## SOLANO COUNTY GENERAL PLAN

The Solano County General Plan applies to all lands outside of the jurisdictional boundaries of the seven incorporated cities, which composes the unincorporated Solano County. The Solano County General Plan is the guide for both land development and conservation in the unincorporated portions of the county and contains policy framework necessary to fulfill the community's vision for Solano County in 2030; a sustainable place with a thriving environment and an economy that maintains social equity.<sup>16</sup>

The Solano County General Plan includes the following adopted policies related to agricultural land conversion within the Agriculture and Resources elements.

*AG.P-1:* Ensure that agricultural parcels are maintained at a sufficient minimum parcel size so as to remain a farmable unit. Farmable units are defined as the size of parcels a farmer would consider viable for leasing or purchasing for different agricultural purposes. A farmable unit is not considered the sole economic function that will internally support a farm household.

*AG.P-4:* Require farmland conversion mitigation for either of the following actions:

- a) General Plan amendment that changes the designation of any land from an agricultural to a nonagricultural use; or,
- b) an application for a development permit that changes the use of land from production agriculture to a nonagricultural use, regardless of the General Plan designation.

*RS.P-62:* Retain community separators of sufficient size to ensure the continued economic sustainability of areas in productive agricultural use.

## AFFECTED ENVIRONMENT

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

There is approximately 157,736 acres of FMMP designated Important Farmland in Solano County, mostly located in the northeastern portion of the county and a small amount just west of Fairfield.<sup>17</sup> Of this, 139,536 acres is designated as Prime Farmland, 11,036 acres are designated as Unique Farmland, and 7,164 acres are designated as Farmland of Statewide Importance. The lands within and immediately adjacent to the cities of Vacaville and Fairfield are predominantly urban and built-up land. Most of the Prime Farmland within the study area is located west of Fairfield, in Suisun Valley.

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<sup>16</sup>16 Solano County General Plan, Introduction 2008

<sup>17</sup>17 Solano County General Plan EIR (2008)

## 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 CPA-106. 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. The Williamson Act property that would be affected by the Build Alternative is 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. In addition, Government Code Section 51291(b) requires Caltrans to notify the Director of the California Department of Conservation and Solano County, as the local governing body responsible for the administration of the preserve, of the Williamson Act contracted land proposed for acquisition for a proposed project.

### Build Alternative

The Build Alternative would result in the conversion of a small amount of farmland protected by the Solano County General Plan Policies AG.P-1, AG.P-4, and RS.P-62 and the NRCS' Farmland Protection Policy Act. The West Segment of the Build Alternative would convert a total of 0.01 acre of Prime Farmland for a utility easement (**Table 2.1-6**). 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 Prime farmland. The 0.01 acre that would be converted to a utility easement is also under a Williamson Act contract.

**Table 2.1-6 Farmland and Williamson Act Property Acquisition**

Assessor Parcel Number (APN)	Property Owner	Partial ROW Take		Utility Easement	
		Square feet	Acre	Square feet	Acre
0027-510-180	Rowland Family Properties	0.0	0.0	437	0.01
	<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.01</b>

Source: Caltrans, 2014d

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. Acquisition of Williamson Act property for state highway projects is not considered adverse under NEPA.

*West Segment –Fundable First Phase*

All of the affected FMMP designated farmland and Williamson Act property are located within the West Segment. The environmental consequences identified above for the Build Alternative apply to the West Segment.

**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.

**West Segment –Fundable First Phase**

Implementation of the West Segment would result in the same farmland conversion as the Build Alternative, and would be required to comply with **Measure FRM-1**.

## 2.1.5 COMMUNITY IMPACTS

Information in the community impacts section is based on the CIA prepared for the project (Caltrans, 2014d). The study area for community impacts was defined by available statistical data describing the thirty-six 2010 census block groups (within 19 census tracts) that encompass or are adjacent to the project limits.<sup>18</sup> The entire community impacts study area is within the City of Vacaville, the City of Fairfield, and unincorporated Solano County. **Figure 2.1-2** shows the boundary of each block group that comprises the community impact study area. **Table 2.1-7** lists each block group number and assigns a number to correspond with **Figure 2.1-3**.

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<sup>18</sup> A census tract is a geographic region within a county. The census tract is broken into smaller block groups, which provide specific data for a more refined geography. Block groups are generally the size of several city blocks, and are therefore useful for representing the characteristics of a community.

## COMMUNITY CHARACTER AND COHESION

### Regulatory Setting

The National Environmental Policy Act of 1969 (NEPA), 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 Federal Highway Administration in its implementation of NEPA (23 United States Code [USC] 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.

### Affected Environment

#### *Demographic Profile*

According to the 2010 U.S. Census, the population of the community impact study area is 55,614. 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. A person that is Hispanic or Latino is a person of Cuban, Mexican, or any Spanish cultural or origin. People who identify as Hispanic, Latino, or Spanish may be of any race.<sup>19</sup>

**Table 2.1-8** shows the racial and ethnic composition of the community impact study area and associated jurisdictions. The minority population within the City of Vacaville represents 45 percent of the community; the City of Fairfield minority population represents 65 percent of the community; and the Solano County minority population represents 59 percent of the community.<sup>20</sup> Comparatively, 54 percent of the community impact study area is comprised of minority populations. **Table 2.1-8** summarizes the population distribution between each race.

**Table 2.1-9** shows the median household income, poverty levels, and per capita income for the study area in comparison with the surrounding cities and the county. According to the 2000 Census, the median household income of the study area is \$57,614, which is comparable to Solano County with a median household income of \$54,099. The median household income of the City of

<sup>19</sup> US Census. 2012. About Hispanic Origin. Accessed from <http://www.census.gov/topics/population/hispanic-origin.html> on December 29, 2014.

<sup>20</sup> 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.

Vacaville is similar to the study area at \$57,667, but is slightly higher than the City of Fairfield median household income of \$51,151.<sup>21</sup> Per capita income in the both the Cities of Vacaville and Fairfield, as well as the Solano County, are relatively similar to each other. Data is not available to assess per capita income in the study area. The percentage of population below the poverty level in the study area is lower than in Solano County and the City of Fairfield, but is slightly higher than in the City of Vacaville, as further described in under *Environmental Justice*.

The management, professional sales, and office trade industries employ approximately 31 to 32 percent of the workforce within the cities of Vacaville and Fairfield. Likewise, the service, sales, and office industries employ 17.6 to 26 percent of the workforce. The farming, fishing, forestry, and construction-related industries represent the smallest employment sector for these cities and employ approximately 10.4 to 12.8 percent of the workforce. As of March 2013, Solano County's unemployment rate (8.1 percent) was above the City of Vacaville's (6 percent), and slightly below the City of Fairfield's (8.9 percent) unemployment averages.

The values and issues that are important to a community set the character and baseline context for how the proposed project would fit into the community's ideologies. The City of Fairfield considers itself to be one of the most desirable growth centers in the Bay Area with a central location between San Francisco and Sacramento. Community members can enjoy shopping at Solano Town Center, swimming at the new aquatics complex, and visiting the park and recreational areas in the community. Residents can access and gather various local volunteer opportunities, upcoming community events, parks and recreational resources on the city's website. Additionally, the local Solano County Library and community center offers programs and events for children, teenagers, and families in the community.

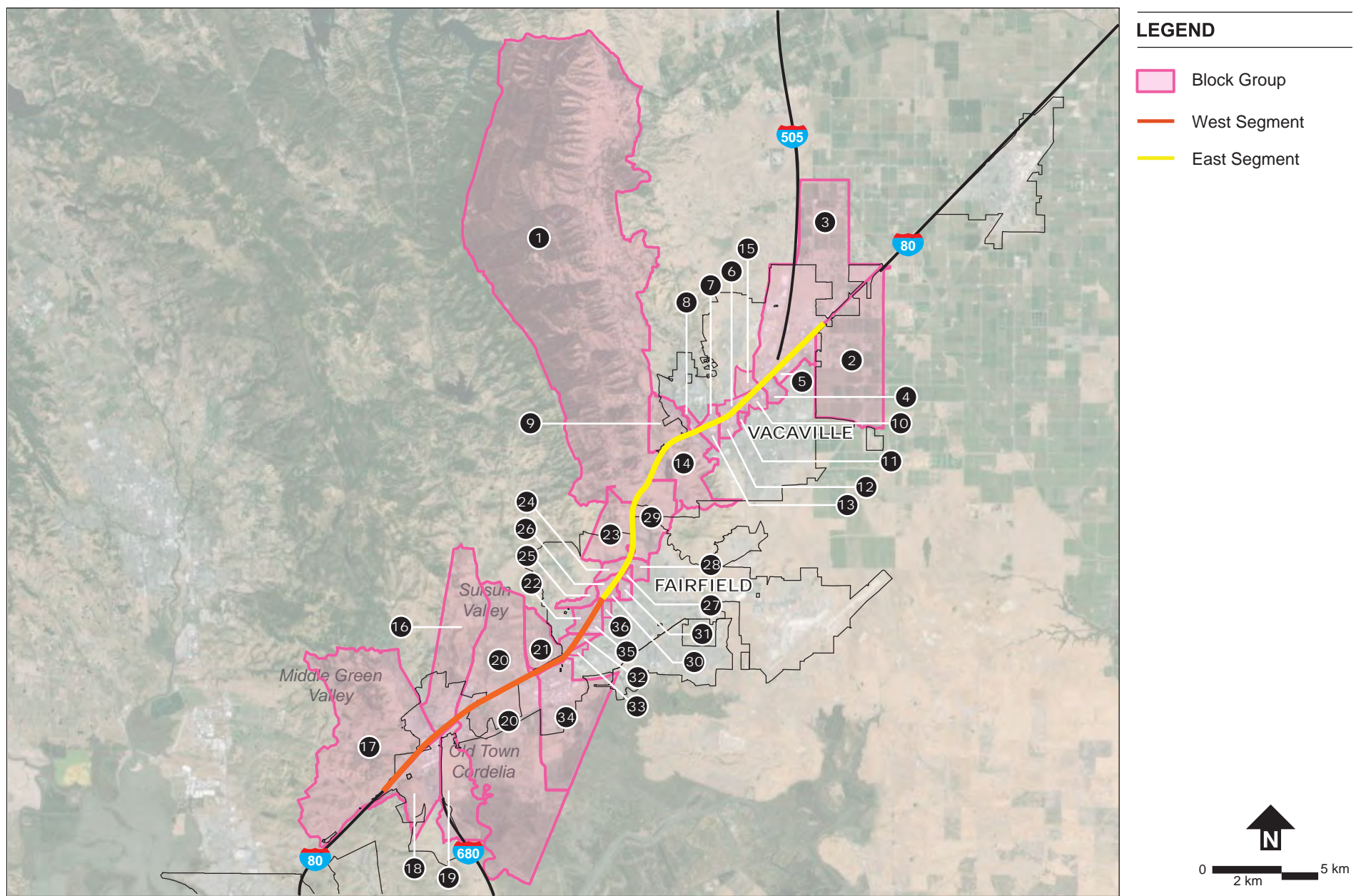
In a community survey conducted in Vacaville, 94 percent of residents consider Vacaville a "good" place to live, raise a family, and retire.<sup>22</sup> However, according to the city's outreach poll to community members, the most important issues to the community are the need to attract businesses and jobs to Vacaville, protect open space, crime prevention, and offer after-school programs for students.

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<sup>21</sup> Data for income was only available from the U.S. Census for the 2000 decennial census data at the time of this document preparation.

<sup>22</sup> City of Vacaville. 2013. State of the City 2013. Accessed 2/20/2014 at <http://www.cityofvacaville.com/index.aspx?page=29&recordid=443&returnURL=%2Findex.aspx%3Fpage%3D51>





Study Area Block Groups

Figure 2.1-3

Source: Caltrans, 2014d

**Table 2.1-7 Census Tracts and Block Groups**

<b>Solano County</b>			
<b>#</b>	<b>City of Vacaville</b>		<b>City of Fairfield</b>
1	Block Group 4, Census Tract 2529.03	16	Block Group 1, Census Tract 2522.01
2	Block Group 3, Census Tract 2529.04	17	Block Group 4, Census Tract 2522.01
3	Block Group 2, Census Tract 2529.04	18	Block Group 2, Census Tract 2522.02
4	Block Group 1, Census Tract 2529.11	19	Block Group 3, Census Tract 2522.02
5	Block Group 2, Census Tract 2529.11	20	Block Group 1, Census Tract 2523.05
6	Block Group 1, Census Tract 2531.01	21	Block Group 2, Census Tract 2523.05
7	Block Group 2, Census Tract 2531.01	22	Block Group 2, Census Tract 2523.06
8	Block Group 5, Census Tract 2531.01	23	Block Group 2, Census Tract 2523.11
9	Block Group 6, Census Tract 2531.01	24	Block Group 3, Census Tract 2523.11
10	Block Group 1, Census Tract 2531.05	25	Block Group 1, Census Tract 2523.12
11	Block Group 5, Census Tract 2531.05	26	Block Group 2, Census Tract 2523.12
12	Block Group 1, Census Tract 2531.07	27	Block Group 1, Census Tract 2523.13
13	Block Group 1, Census Tract 2531.08	28	Block Group 2, Census Tract 2523.13
14	Block Group 3, Census Tract 2531.08	29	*Block Group 3, Census Tract 2523.13
15	Block Group 3, Census Tract 2532.05	30	Block Group 1, Census Tract 2523.14
		31	Block Group 2, Census Tract 2523.14
		32	Block Group 3, Census Tract 2524.01
		33	Block Group 4, Census Tract 2524.01
		34	Block Group 2, Census Tract 2524.02
		35	Block Group 1, Census Tract 2526.04
		36	Block Group 2, Census Tract 2526.04

Source: Caltrans, 2014d

\*Note: Block group is located within both Fairfield and Vacaville city boundaries

**Table 2.1-8 Racial and Ethnic Composition 2010**

<b>Population</b>	<b>Solano County</b>	<b>City of Vacaville</b>	<b>City of Fairfield</b>	<b>Study Area Tracts</b>	<b>Study Area Block Groups</b>
Total Population	413,344 (100%)	92,428 (100%)	105,321 (100%)	95,238 (100%)	55,614 (100%)
Hispanic or Latino (of any race)	99,356 (24%)	21,121 (23%)	28,789 (27%)	22,634 (24%)	12,833 (23%)
Not Hispanic or Latino	313,988 (76%)	71,307 (77%)	76,532 (73%)	72,604 (76%)	42,781 (77%)
White	168,628 (41%)	50,811 (55%)	37,091 (35%)	45,544 (48%)	25,611 (46%)
Black or African American	58,743 (14%)	9,187 (10%)	15,979 (15%)	9,617 (10%)	6,042 (11%)
American Indian and Alaska Native	1,864 (<1%)	510 (1%)	462 (<1%)	516 (1%)	306 (1%)
Asian	59,027 (14%)	5,378 (6%)	15,265 (14%)	11,107 (12%)	7,279 (13%)
Native Hawaiian and Other Pacific Islander	3,243 (1%)	436 (<1%)	1,049 (1%)	702 (1%)	410 (1%)
Some Other Race	1,463 (<1%)	765 (1%)	231 (<1%)	161 (<1%)	110 (<1%)
Two or More Races	21,020 (5%)	4,220 (5%)	6,455 (6%)	4,957 (5%)	3,023 (5%)

Source: Caltrans, 2014d

**Table 2.1-9 Household Income and Population Below Poverty Level (%), 2000**

<b>Geographic Area</b>	<b>Median Household Income</b>	<b>% Population Below Poverty Level</b>	<b>Per Capita Income</b>
Study Area	\$54,099	6.3%	N/A
Solano County	\$54,099	8.3%	\$21,731
City of Fairfield	\$51,151	9.3%	\$20,617
City of Vacaville	\$57,667	6.1%	\$21,557

Source: Caltrans, 2014d

The City passed Measures I and M that are general tax initiatives that support performing arts centers, libraries, parks and street maintenance. The city conducted general outreach to the community to educate residents on these measures and the majority of residents supported these efforts, demonstrating interest in enhancing public services.

The southern portion of the project limits, from Red Top Road to the SR 12/I-80 interchange, in Fairfield, contain a mix of commercial, open space, industrial, agricultural, and residential land uses located adjacent to the I-80 corridor. The project limits through the City of Fairfield to the City of Vacaville, are surrounded by residential, commercial, agricultural, and open space land uses. Similarly, land uses along the I-80 corridor in the City of Vacaville consist of residential, commercial, and some open space and education/public/semi-public. Refer to **Section 2.1.1, Land Use**, for a detailed discussion on the existing land use patterns surrounding the project limits.

### **Environmental Consequences**

#### *Build Alternative*

Community impacts 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 psychological 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.

Vacaville and Fairfield are well-established communities along the project corridor and contain closely-knit neighborhoods. As previously discussed, both cities organize community events, maintain parks and recreational resources, support public library services, etc. for the community. Such resources 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 I-80 corridor; therefore, no new physical or perceptual barriers would be created nor would access be modified that could potentially disrupt such activities. No division of existing neighborhoods or disruption of the communities' routines would result from implementation of the Build Alternative. Accordingly, the Build Alternative would not negatively affect community cohesion within adjacent communities.

#### *West Segment –Fundable First Phase*

As in the Build Alternative, the West Segment would not negatively affect community cohesion as all proposed roadway improvements are either on, or immediately adjacent to the I-80 corridor; therefore, no new physical or perceptual barriers would be created.

### *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.

### 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 2014, this was \$23,850 for a family of four<sup>23</sup>.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. The Department's 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; or
- 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 2.1-8** (above) 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 minority population within the City of Vacaville represents 45 percent of the community; the

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<sup>23</sup> Per the U.S. Department of Health and Human Services, <http://aspe.hhs.gov/poverty/14poverty.cfm>

City of Fairfield minority population represents 65 percent of the community; the Solano County minority population represents 59 percent of the community.<sup>24</sup> Comparatively, 54 percent of the community impact study area is comprised of minority populations.

Approximately 23 of the 36 block groups in the study area have minority populations greater than 50 percent. The study area contains five block groups with a minority population which exceeds their respective city average by more than 10 percentage points (shown in **Table 2.1-10**). Three of these block groups are located in the City of Vacaville and two in the City of Fairfield. Accordingly, each of these block groups are considered an environmental justice community based on race.

**Table 2.1-10 Environmental Justice Block Groups – Minority Percent**

City of Vacaville	Percent Minority	City of Fairfield	Percent Minority
Block Group 3, Census Tract 2532.05, Solano County, California	81%	Block Group 2, Census Tract 2526.04, Solano County, California	80%
Block Group 1, Census Tract 2531.05, Solano County, California	59%	Block Group 4, Census Tract 2524.01, Solano County, California	80%
Block Group 1, Census Tract 2531.01, Solano County, California	67%	--	--

Source: Caltrans, 2014d

*Socioeconomic Data: Low-Income Populations*

**Table 2.1-11** presents the percentage of the population at or below the poverty level for the block groups located within the study area and the associated cities and county, according to the 2000 Census.<sup>25</sup> The percentage of population below the poverty level in the study area (6.3 percent) is lower than in Solano County (8.3 percent) and the City of Fairfield (9.3 percent), but is slightly higher than in the City of Vacaville (6.1 percent).

**Table 2.1-11 Household Income and Population Below Poverty Level (%), 2000**

Geographic Area	Median Household Income	Percent Population Below Poverty Level
Study Area	\$57,614	6.3%
Solano County	\$54,099	8.3%
City of Vacaville	\$57,667	6.1%
City of Fairfield	\$51,151	9.3%

Source: Caltrans, 2014d

<sup>24</sup> 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.

<sup>25</sup> 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.

The study area contains five block groups in which the low-income population exceeds the city averages by more than 10 percent. These include three block groups in the City of Vacaville and two block groups in the City of Fairfield, as listed in **Table 2.1-12**.

**Table 2.1-12 Environmental Justice Block Groups – Low Income**

City of Vacaville	% Population Below Poverty Level	City of Fairfield	% Population Below Poverty Level
Block Group 1, Census Tract 2531.05	17.4%	Block Group 3, Census Tract 2524.02	30.1%
Block Group 2, Census Tract 2532.02	17.0%	Block Group 1, Census Tract 2526.05	21.2%
Block Group 3, Census Tract 2532.02	27.9%		

Source: Caltrans, 2014d

## Environmental Consequences

### *Build Alternative*

As previously discussed, 23 of the 36 block groups within the study area meet the criteria of an environmental justice community. 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 increased 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-80 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. Accordingly, the environmental effects of the project that would be borne by the environmental justice communities within the study area would not be more severe or greater in magnitude than the adverse effects that would be suffered by non-environmental justice communities.

The Build Alternative would not result in disproportionately high and adverse 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 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 9 census block groups in the community impact study area where minority and/or low-income populations exceed the city averages by more than 10 percent. **Table 2.1-13** summarizes these environmental justice block groups in the community impact study area. Because these environmental justice block groups have substantially higher minority/low-income populations than their respective city averages, 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 9 block groups when compared to the rest of the adjacent communities.

**Table 2.1-13 Environmental Justice Block Groups – Build Alternative**

Environmental Justice Block Groups	Environmental Justice Qualification	Land Use Impact
Block Group 3, Census Tract 2532.05	Race	None
Block Group 1, Census Tract 2531.05	Race and Income	None
Block Group 1, Census Tract 2531.01	Race	None
Block Group 2, Census Tract 2526.04	Race	None
Block Group 4, Census Tract 2524.01	Race	None
Block Group 2, Census Tract 2532.02	Income	None
Block Group 3, Census Tract 2532.02	Income	None
Block Group 3, Census Tract 2524.02	Income	None
Block Group 1, Census Tract 2526.05	Income	None

Source: Caltrans, 2014d

*West Segment – Fundable First Phase*

There are two census tract block groups in the West Segment of the study area that qualify as environmental justice populations. The environmental justice block groups within the West Segment are listed in **Table 2.1-14** below.

**Table 2.1-14 Environmental Justice Block Groups – West Segment**

Environmental Justice Block Groups	Environmental Justice Qualification	Land Use Impact
Block Group 3, Census Tract 2524.02, City of Fairfield	Income	None
Block Group 1, Census Tract 2526.05, City of Fairfield	Income	None

Source: Caltrans, 2014d



As with the Build Alternative, the West Segment 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-80, 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 would not 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 UTILITIES/EMERGENCY SERVICES**

#### **AFFECTED ENVIRONMENT**

Information in this section is based on the draft project report (DPR) and the CIA (Caltrans, 2014d) 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. The Fairfield Water and Sewer Department and Vacaville Water and Sewer provide local and regional water service. Wastewater collection, treatment, and disposal are provided by the Fairfield Suisun Sewer District and the City of Vacaville's Easterly Wastewater Treatment Plant (WWTP). Solid waste disposal and recycling services are provided by Solano Garbage Company/Republic Services and Recology Vacaville Solano.

Police protection and traffic enforcement services within the project limits are provided by the Fairfield Fire Department, Fairfield Police Department, Vacaville Fire Department, and Vacaville Police Department. The California Highway Patrol (CHP) has jurisdiction over the I-80 corridor for matters involving both traffic violations and emergency services. The closest CHP office to the project limits is located in Fairfield (on eastbound I-80 between the SR 12 and Green Valley Road overcrossings).

## ENVIRONMENTAL CONSEQUENCES

### **Build Alternative**

#### *Public Utilities*

The Build Alternative would include toll collection on the proposed express lanes collected from registered motorists who carry in-vehicle-mounted FasTrak transponders. License Plate Recognition (LPR) cameras would capture license plate images of vehicles that do not display a recognizable toll transponder. There are four proposed tolling zones, two within each segment. 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. The tolling equipment includes static or variable mounted signage that inform motorists of the operating rules, pricing by toll zone, and where the express lanes begin and end.

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, telephone demarcation cabinet, controllers, signs, and tolling equipment. Installation of pull boxes and electrical systems such as service equipment enclosure, telephone demarcation cabinet, controllers, and foundation pads would also be required and would follow Caltrans standards. Temporary construction access to power and communication sources may be needed. Work associated with bringing electrical power and communication to service enclosure cabinets would be completed by the utility provider and would follow utility provider standards.

#### *Emergency Services*

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. 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 potentially improve access and response times for emergency services utilizing I-80 corridor within the project limits.

### **West Segment –Fundable First Phase**

The effects to utilities and emergency services described above for the Build Alternative are also applicable to the West Segment. There are no proposed improvements or conditions specific to the West 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-80 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.

#### **West Segment –Fundable First 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 the West Segment. No additional avoidance, minimization, or mitigation measures would be required for West Segment.

## **2.1.7 TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES**

### **REGULATORY SETTING**

Caltrans, as assigned by 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

This section discusses the Build Alternative's effects on motor vehicle traffic and circulation. Information in this section is based on the Final Traffic Operations Analysis Report that was prepared for the project (Caltrans, 2014q).

The traffic study area is intended to capture the local and regional traffic effects of the Build Alternative. The traffic study area encompasses I-80 from American Canyon Road to Leisure Town Road, within Solano County, California. A map of the traffic study area is shown on **Figure 2.1-4**.

I-80 is a major transcontinental freeway extending between the San Francisco Bay Area and Ridgefield Park, New Jersey. Within the study area, I-80 serves as the primary freeway route from the San Francisco to the outlying communities of Fairfield, Suisun, and Vacaville; and recreational destinations such as Lake Tahoe and Reno, Nevada.

### Current and Forecast Traffic Analysis and Methodology

The majority of data collection was undertaken between 2010 and 2012 to determine existing peak period travel times, mainline queuing characteristics, traffic volumes, vehicle occupancies, and truck percentages within the traffic study limits.<sup>26</sup> Additionally, mainline and ramp lane configurations were collected along the study segments.<sup>27</sup> Based on the collected data, it was determined that the weekday morning and evening peak periods are 6:00 AM to 9:00 AM, and 3:00 PM to 6:00 PM, respectively. The weekday morning (AM) peak hour is 7:00 AM to 8:00 AM, and the weekday evening (PM) peak hour is 4:00 PM to 5:00 PM. Traffic forecasts were based on applications of the Solano-Napa Travel Demand Model and developed in more detail for the traffic study limits using VISSIM software. To ensure accuracy, the VISSIM output volumes were compared to the input volumes, which are based on vehicular volume counts that were conducted by Caltrans. The VISSIM model output volumes are then calibrated.<sup>28</sup>

The traffic operations analysis evaluates three distinct timeframes:

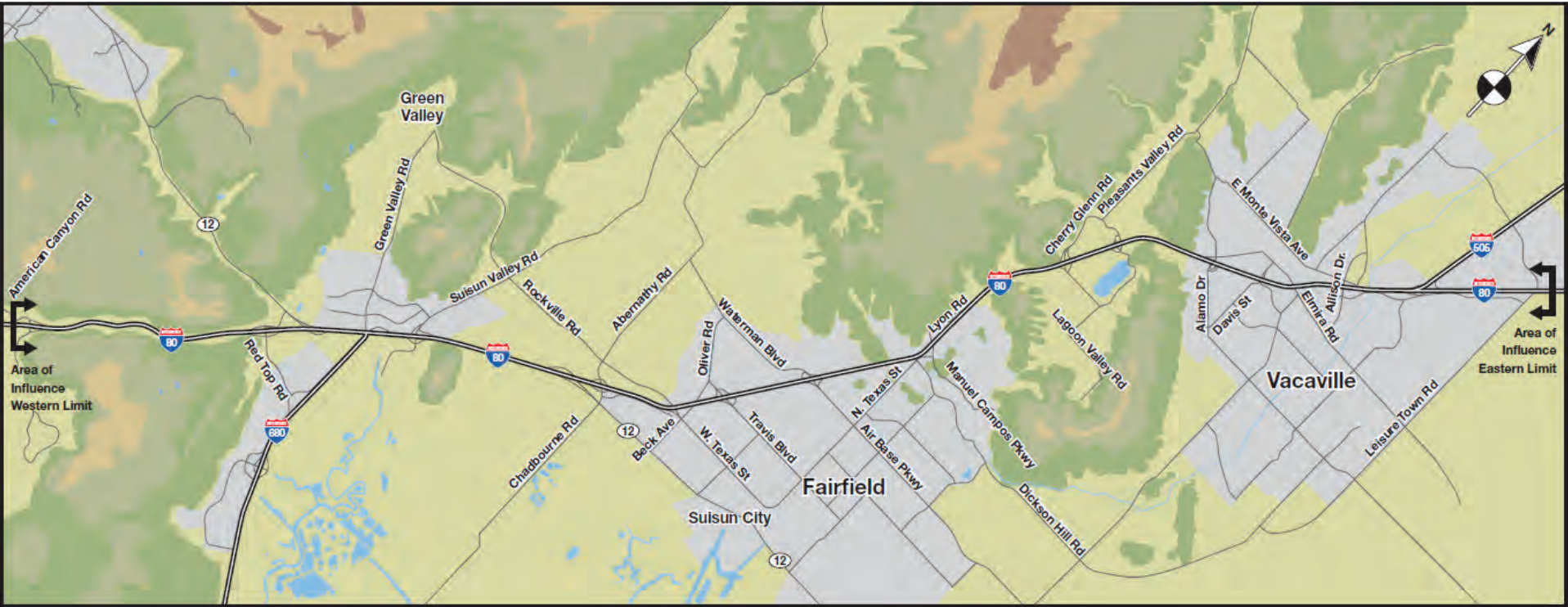
- existing (2010)
- opening year (2020)
- horizon year (2040)

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<sup>26</sup> Additional data was collected late 2008 through early 2009

<sup>27</sup> The freeway "mainline" refers to the general mixed-flow travel lanes

<sup>28</sup> Calibration is the adjustment of model parameters to improve the model's ability to reproduce local traffic conditions.



NOT TO SCALE



Traffic Study Area

Figure

2.1-4

Source: Caltrans, 2014q

### *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 operations based on the LOS criteria for highway and weaving segments, highway ramp junctions, and peak commute hour vehicle densities, measured in vehicles per mile per lane (vpmpl). The criteria used in this traffic analysis are consistent with the procedures contained in the Highway Capacity Manual (see **Figure 2.1-5**).

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 I-80 corridor.

- **Volume Served** – a measure of the vehicles that can be served by the I-80 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.
- **Average Travel Speed** – the average speed of vehicles in the network. This measure depends both on the posted speed for a given segment and the level of traffic congestion.
- **Level of Service** – a measure of actual traffic conditions and the perception of such conditions by motorists.

### **Existing Traffic Operations**

Field observations were conducted and found that during weekday morning and evening peak periods, slowing occurs on both eastbound and westbound I-80, including:

- **I-80 between the I-680 Interchange and the SR 12 East (to Rio Vista) Interchange** – due to closely spaced ramps, high vehicular volumes merging and diverging at the I-680 and SR 12 East Interchanges, and truck movements to and from the Cordelia Truck Scales.
- **I-80 between Travis Boulevard and Lagoon Valley Road/Cherry Glen Road** – due to high traffic volumes, and the roadway grades and curvature near Lagoon Valley Road/Cherry Glen Road.
- **I-80 between the Jameson Canyon Road/SR 12 West Interchange and Red Top Road** – westbound exasperated by the lane drop from five lanes to four lanes in this location.

The portion of the I-80 corridor within the cities of Fairfield and Vacaville is the most heavily-traveled segment of the freeway corridor within Solano County, and is utilized by commuters, recreational travelers, public transit services, and for interstate and interregional goods

movements. As a result of this travel pattern, the I-80 corridor experiences high levels of weekday morning and evening travel demand. In 2009, the I-80 corridor was improved with HOV lanes in both directions from Red Top Road to Air Base Parkway, in the City of Fairfield.

#### *Peak Hour Performance*

##### **I-80 Eastbound**

Generally, vehicular speeds along eastbound I-80 average between 55 mph and 70 mph during both weekday AM and PM peak hours. Vehicles in the eastbound direction were observed to slow to between 55 and 60 mph at the I-680 Interchange, the SR 12 East Interchange, and between Travis Boulevard and Lagoon Valley Road/Cherry Glen Road. Additional slowing occurs between Manuel Campos Parkway/North Texas Street and Lagoon Valley Road/Cherry Glen Road.

LOS D conditions occur on eastbound I-80 during the evening peak hour along an approximately 10-mile stretch from Air Base Parkway/Waterman Boulevard and Monte Vista Avenue/Allison Drive/Nut Tree Parkway (see **Table 2.1-15**). Travel time eastbound during both the AM peak hour and PM peak hour averaged approximately 20 minutes between American Canyon Road and Leisure Town Road. No significant bottlenecks or traffic congestion was observed in the eastbound direction during AM and PM weekday peak periods.

Along eastbound I-80, there is a significant increase in eastbound traffic using the on-ramp at Peabody Road and Alamo Drive during the weekday PM peak hour as compared to non-peak hours. There is also a sharp increase in traffic using the following ramps during both the weekday AM peak hour and PM peak hour:

- Off-ramp at Red Top Road
- Off-ramp at Suisun Valley Road/Pittman Road
- Off-ramp at Abernathy Road.
- Off-ramp at Air Base Parkway/Waterman Boulevard
- Off-ramp at Manuel Campos Parkway/North Texas Street
- Off-ramp at Lagoon Valley Road/Cherry Glen Road
- Off-ramp at Pena Adobe Road/Rivera Road/Cherry Glen Road
- Off-ramp at Davis Street
- Off-ramp at Peabody Road
- Off-ramp at Monte Vista Avenue/Allison Drive/Nut Tree Parkway
- Off-ramp at Leisure Town Road

### **I-80 Westbound**

In the westbound direction, vehicles were observed to slow to between 55 and 60 mph between SR 12 West Interchange and American Canyon Road during the weekday AM peak hour and PM peak hour. Additional slowing occurs between SR 12 and Red Top Road during both the weekday AM peak hour and PM peak hour.

During the morning peak hour, LOS D conditions occur westbound along an approximately 6-mile stretch between Alamo Drive and Manuel Campos Parkway/North Texas Street, and between SR-12/Jameson Canyon Road and Red Top Road (see **Table 2.1-16**). Travel time on westbound I-80 during both the weekday AM peak hour and PM peak hour averaged approximately 20 minutes between Leisure Town Road and American Canyon Road. No significant bottlenecks or traffic congestion was observed in the westbound direction during weekday AM peak hour and PM peak hour.







Heading westbound on I-80, there is a significant increase in traffic using the Mason Street on-ramp during the weekday AM peak hour compared to non-peak hours. There is also a sharp increase in traffic using the following ramps during both weekday AM peak hour and PM peak hour:

- Off-ramp at East Monte Vista Avenue/Allison Drive
- Off-ramp at Mason Street
- Off-ramp at Davis Street
- Off-ramp at Pena Adobe Road/Rivera Road/Pleasant Valley Road
- Off-ramp at Manuel Campos Parkway/North Texas Street
- Off-ramp at Travis Boulevard
- Off-ramp at West Texas Street/Rockville Road.
- Off-ramp at Abernathy Road
- On-ramp at Green Valley Road
- Off-ramp at Red Top Road



# LEVELS OF SERVICE

## for Freeways

Level of Service	Flow Conditions	Density (vehicles/mile /lane)	Technical Descriptions
<b>A</b>		$\leq 11$	Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. <b>No delays</b>
<b>B</b>		$> 11-18$	Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. <b>No delays</b>
<b>C</b>		$> 18-26$	Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. <b>Minimal delays</b>
<b>D</b>		$> 26-35$	Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. <b>Minimal delays</b>
<b>E</b>		$> 35-45$	Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. <b>Significant delays</b>
<b>F</b>		$> 45$	Very congested traffic with traffic jams, especially in areas where vehicles have to merge. <b>Considerable delays</b>

Levels of Service for Freeways

Figure

2.1-5

**Table 2.1-15 Weekday Eastbound AM and PM Peak Hour Level of Service and Speed in General Purpose Lanes**

	Segment	Existing (2010) (LOS/mph)		Existing Plus Project (LOS/mph)		Opening Year (2020) (LOS/mph)						Horizon Year (2040) (LOS/mph)			
		AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	No Build		West Segment Only		Build Alternative		No Build		Build Alternative	
						AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density
1	I-80 between American Canyon Rd. and Red Top Rd.	B/61/13	C/60/20	B/54/13	C/60/20	B/63/14	C/61/24	B/63/14	C/61/24	B/63/14	C/60/24	C/62/20	D/58/33	C/62/20	D/58/33
2	I-80 between Red Top Rd. and SR-12	A/65/10	B/64/15	B/63/12	B/62/17	B/63/14	C/60/22	B/63/13	C/60/22	B/63/13	C/60/22	B/60/16	C/55/26	B/60/16	C/56/25
3	I-80 between SR-12 and I-680	B/61/11	C/52/20	B/58/13	C/50/22	B/59/14	D/43/34	B/59/14	D/45/21	B/58/14	D/48/31	C/62/18	D/58/29	B/63/15	C/60/24
4	I-80 between I-680 and Suisun Valley Rd./Pittman Rd.	B/62/13	C/55/23	B/60/14	C/52/26	B/61/16	D/52/30	B/61/16	D/54/29	B/61/16	D/53/29	C/62/18	C/60/24	B/62/18	D/55/32
5	I-80 between Suisun Valley Rd./Pittman Rd. and Truck Scale	B/63/15	C/59/25	B/62/15	C/57/26	B/61/15	D/53/30	B/61/15	D/55/28	B/61/15	D/55/29	C/60/20	D/53/34	C/60/20	D/54/33
6	I-80 between Truck Scale and SR-12	B/63/14	C/59/24	B/62/15	C/58/25	B/65/13	C/62/22	B/65/13	C/63/22	B/65/13	C/62/22	C/64/17	C/62/26	B/64/17	C/61/27
7	I-80 between SR-12 and Abernathy Rd.	B/65/13	C/62/22	B/63/14	C/61/25	B/61/15	D/55/28	B/61/15	D/55/28	B/61/15	D/55/28	B/59/21	D/49/35	C/58/20	D/50/34
8	I-80 between Abernathy Rd. and Magellan Rd.	B/63/11	C/50/25	B/61/12	C/49/27	B/61/14	D/51/28	B/61/14	C/55/26	B/62/14	C/54/26	C/61/17	D/53/30	B/61/17	D/54/29
9	I-80 between Magellan Rd. and Beck Ave.	B/64/12	C/61/22	B/63/13	C/60/24	B/62/15	D/57/29	B/62/15	D/58/28	B/62/15	D/58/28	B/61/20	D/56/32	C/61/19	D/57/32

	Segment	Existing (2010) (LOS/mph)		Existing Plus Project (LOS/mph)		Opening Year (2020) (LOS/mph)						Horizon Year (2040) (LOS/mph)			
		AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	No Build		West Segment Only		Build Alternative		No Build		Build Alternative	
						AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density
10	I-80 between Beck Ave. and Travis Blvd.	B/64/11	C/60/21	B/62/12	C/60/23	B/61/13	D/53/29	B/62/13	C/58/26	B/62/13	C/57/26	B/60/17	<b>E/47/36</b>	B/61/17	D/56/30
11	I-80 between Travis Blvd. and Air Base Pkwy./Waterman Blvd.	B/65/12	C/61/23	B/63/14	C/60/25	B/63/15	D/57/29	B/63/15	D/58/29	B/63/15	D/58/29	B/61/20	D/56/32	B/61/19	D/56/32
12	I-80 between Air Base Pkwy./Waterman Blvd. and Manuel Campos Pkwy./N. Texas St.	B/61/16	D/58/30	B/60/14	D/58/26	B/64/17	D/60/31	B/64/17	D/59/33	B/63/15	D/59/28	C/61/21	D/56/33	B/62/19	D/57/32
13	I-80 between Manuel Campos Pkwy./N. Texas St. and Lagoon Valley Rd./Cherry Glen Rd.	B/60/17	D/57/30	B/60/14	D/58/26	C/62/18	D/58/32	C/62/19	D/58/33	B/62/17	D/59/28	C/60/25	<b>E/56/36</b>	C/61/22	D/57/32
14	I-80 between Lagoon Valley Rd./Cherry Glen Rd. and Pena Adobe Rd./Rivera Rd./Cherry Glen	B/59/18	D/58/30	B/59/16	C/58/25	C/61/19	D/58/32	C/62/19	D/57/33	B/62/17	D/58/29	C/59/25	<b>E/55/38</b>	C/60/22	D/57/21
15	I-80 between Pena Adobe Rd./Rivera Rd./Cherry Glen and Alamo Dr.	B/61/17	D/57/30	B/61/15	D/58/26	C/62/19	D/57/33	C/62/19	D/57/34	B/62/17	D/58/29	C/60/25	<b>E/56/36</b>	C/60/22	D/57/33
16	I-80 between Alamo Dr. and Davis St.	B/61/16	D/55/28	B/64/14	C/60/24	B/59/18	D/52/32	C/59/18	D/52/32	B/59/16	D/54/27	C/57/24	D/50/35	C/58/21	D/52/31

	Segment	Existing (2010) (LOS/mph)		Existing Plus Project (LOS/mph)		Opening Year (2020) (LOS/mph)						Horizon Year (2040) (LOS/mph)			
		AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	No Build		West Segment Only		Build Alternative		No Build		Build Alternative	
						AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density
17	I-80 between Davis St. and Peabody Rd.	B/61/16	D/57/26	B/61/14	C/57/23	B/59/18	D/53/32	B/59/18	D/53/30	B/59/16	D/55/26	C/56/25	<b>E/51/36</b>	C/58/22	D/52/32
18	I-80 between Peabody Rd. and Monte Vista Ave./Allison Dr./Nut Tree Pkwy.	B/63/17	D/57/27	B/62/15	C/58/23	C/61/19	D/55/30	C/61/19	D/56/29	B/61/17	C/58/26	C/59/24	D/54/33	C/60/21	D/55/29
19	I-80 between Monte Vista Ave./Allison Dr./Nut Tree Pkwy. and I-505/Orange Dr.	B/64/14	B/62/18	B/64/12	B/63/16	B/62/15	B/61/19	B/62/15	B/61/19	B/62/14	B/62/16	B/60/20	C/60/21	B/62/17	B/61/19
20	I-80 between I-505/Orange Dr. and Leisure Town Rd.	B/63/15	C/61/21	B/63/15	C/61/21	B/62/17	C/60/24	B/62/17	C/60/24	B/63/17	C/60/23	C/59/23	D/57/28	C/60/23	D/58/27

Source: Caltrans, 2014q

**Table 2.1-16 Weekday Westbound AM and PM Peak Hour Level of Service and Speed in General Purpose Lanes**

	Segment	Existing		Existing Plus Project		Opening Year (2020)						Horizon Year (2040)			
		AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	No Build		West Segment Only		Build Alternative		No Build		Build Alternative	
						AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density
1	I-80 between Leisure Town Rd. and I-505	B/63/16	C/62/18	B/63/16	C/62/18	B/62/18	C/61/20	B/62/18	C/61/20	B/62/17	C/61/20	C/61/21	D/59/26	C/61/21	D/58/26
2	I-80 between I-505 and E. Monte Vista Ave.	C/62/19	C/61/23	B/62/18	C/61/21	C/61/22	C/60/26	C/61/22	C/60/26	C/61/20	C/60/23	D/59/28	D/56/33	D/59/26	D/58/30
3	I-80 between E. Monte Vista Ave. and Mason St.	C/61/21	C/61/22	C/62/19	C/61/20	C/60/24	C/59/26	C/60/24	C/59/26	C/60/21	C/60/23	D/58/30	D/57/32	C/59/25	D/58/29
4	I-80 between Mason St. and Davis St.	C/56/24	C/58/22	C/57/21	C/59/19	D/53/29	D/55/26	D/52/29	C/56/26	C/55/24	C/57/22	<b>E/49/39</b>	<b>E/50/41</b>	D/53/29	D/53/32
5	I-80 between Davis St. and Alamo Dr.	C/59/23	C/60/22	C/60/21	C/60/19	D/56/28	C/58/25	D/57/28	C/58/25	C/58/24	C/59/22	<b>E/53/36</b>	<b>E/54/35</b>	D/55/29	D/56/30
6	I-80 between Alamo Dr. and Cherry Glen Rd.	D/52/32	C/57/23	D/54/27	C/58/21	D/59/27	C/59/26	D/55/30	D/55/29	C/56/26	C/57/24	<b>E/53/37</b>	<b>E/53/37</b>	D/54/32	D/52/35
7	I-80 between Cherry Glen Rd. and Pena Adobe Rd./Rivera Rd./Pleasant Valley	D/58/28	C/59/23	C/59/24	C/59/21	D/60/28	D/60/26	D/60/27	D/60/26	C/61/24	C/61/23	D/59/31	D/59/31	D/60/27	D/60/28
8	I-80 between Pena Adobe Rd./Rivera Rd./Pleasant Valley and Lagoon Valley Rd./Cherry Glen Rd.	D/57/27	C/58/23	C/58/24	C/58/20	D/58/27	C/59/25	D/59/27	C/59/25	C/59/23	C/60/22	D/57/30	D/56/31	D/58/27	D/57/28

	Segment	Existing		Existing Plus Project		Opening Year (2020)						Horizon Year (2040)			
		AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	No Build		West Segment Only		Build Alternative		No Build		Build Alternative	
						AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density
9	I-80 between Lagoon Valley Rd./Cherry Glen Rd. and Manuel Campos Pkwy./N. Texas St.	D/57/29	C/58/23	C/58/25	C/59/20	D/59/28	C/60/26	D/59/28	D/60/26	C/60/24	C/61/22	D/57/34	D/57/32	D/59/28	D/58/29
10	I-80 between and Manuel Campos Pkwy./N. Texas St. and Air Base Pkwy./Waterman Blvd.	C/62/22	B/63/17	C/61/24	C/62/19	D/59/28	C/60/24	D/59/28	C/60/24	C/59/25	C/61/21	D/58/32	D/59/28	D/58/29	D/59/26
11	I-80 between Air Base Pkwy./Waterman Blvd. and Travis Blvd.	C/60/22	B/62/16	C/59/25	C/61/18	D/58/27	C/59/22	D/57/27	C/60/22	D/58/26	C/60/21	D/57/29	D/58/27	D/57/28	D/58/27
12	I-80 between Travis Blvd. and W. Texas St./Rockville Rd.	C/56/21	B/59/15	C/55/23	B/59/17	C/55/24	C/57/20	C/55/24	C/58/19	C/56/24	C/59/19	D/48/32	C/54/25	D/50/30	D/54/26
13	I-80 between W. Texas St./Rockville Rd. and Abernathy Rd.	C/60/25	B/62/18	D/59/28	C/61/20	D/57/31	C/59/25	D/57/31	C/59/25	D/57/31	C/60/24	<b>E/55/35</b>	D/58/30	D/56/33	D/58/29
14	I-80 between Abernathy Rd. and SR 12	C/59/23	B/61/17	D/58/26	C/60/20	D/59/27	C/60/24	D/59/27	C/60/23	D/59/27	C/60/23	D/58/30	D/59/28	D/58/28	D/59/27
15	I-80 between SR 12 and Truck Scale	C/60/24	B/63/18	C/53/22	B/55/16	D/58/29	C/60/24	D/58/29	C/60/24	D/58/29	C/60/24	<b>E/53/37</b>	D/57/31	D/57/32	D/58/30
16	I-80 between Truck Scale and Suisun Valley Rd./Pittman Rd.	C/57/25	B/61/18	D/56/28	C/59/20	<b>E/49/35</b>	D/54/26	D/52/33	C/55/26	D/51/32	C/56/26	<b>E/51/36</b>	<b>E/50/36</b>	D/53/34	D/51/34

	Segment	Existing		Existing Plus Project		Opening Year (2020)						Horizon Year (2040)			
		AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	No Build		West Segment Only		Build Alternative		No Build		Build Alternative	
						AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density	AM LOS/ Speed/ Density	PM LOS/ Speed/ Density
17	I-80 between Suisun Valley Rd./Pittman Rd. and I-680	C/62/21	B/64/15	C/61/24	B/63/17	C/61/25	C/61/21	C/61/25	C/61/20	C/60/25	C/61/20	D/53/28	C/59/22	D/55/26	B/62/17
18	I-80 between I-680 and Green Valley Rd.	C/59/19	B/62/13	C/56/25	C/59/18	C/60/21	B/61/17	C/60/20	B/61/17	C/60/20	B/61/17				
19	I-80 between Green Valley Rd. and SR-12/Jameson Cyn. Rd.	C/58/23	B/61/16			C/62/22	B/63/17	C/62/21	B/63/17	C/61/22	B/63/17	C/59/22	B/62/18	C/59/21	D/59/30
20	I-80 between SR-12/Jameson Cyn. Rd. and Red Top Rd.	D/51/27	B/64/16	D/51/27	B/64/16	C/60/24	C/61/19	C/60/24	C/62/19	C/59/24	C/62/19	C/58/22	C/59/20	C/59/20	C/59/20
21	I-80 between Red Top Rd. and American Canyon Rd.	C/60/19	B/60/16	C/60/19	B/60/16	C/60/24	C/61/20	C/60/23	C/61/20	C/60/23	C/61/20	D/59/30	D/59/29	D/60/27	D/59/30

Source: Caltrans, 2014q

### Vehicle Occupancy

**Table 2.1-17** summarizes existing vehicle occupancy on I-80, within the project limits. HOV lanes were recently constructed in both directions from Red Top Road to Air Base Parkway in the City of Fairfield. As shown in **Table 2.1-17**, the majority of users of the I-80 corridor during AM peak hour and PM peak hour traveling in both directions are single occupancy vehicles. The unused capacity in the HOV lane ranges between 66 to 88 percent during the peak commute hours, which results in increased congestion and slower speeds in the general purpose lanes during peak commute hours. This available unused capacity in the existing HOV lane system should be utilized to enhance transportation system efficiency.

**Table 2.1-17 Existing Vehicle Occupancy**

Direction	Peak Hour	Single Occupancy (%)	2 Persons (%)	3+ Persons (%)
Eastbound	AM	90	9	1
	PM	81	17	2
Westbound	AM	86	13	1
	PM	77	21	2

Note: Vehicle occupancy numbers have been rounded to the nearest 1.  
Source: Caltrans, 2014q

### Pedestrian and Bicycle Facilities

Within the traffic study area, pedestrian and bicycle travel occurs at several cross street locations that intersect with the I-80 ramp termini. Bike path and bike lane intersections occur at Leisure Town Road, Nut Tree Road, Allison Drive, Elmira Road, Air Base Parkway/Waterman Boulevard, and Oliver Road. The Southside Bikeway begins at California Drive in the City of Vacaville, east of the I-80. It travels northwest, and ends at Davis St. just before it reaches I-80. The Butcher Road Bike Path begins at Butcher Road on the east side of I-80, and travels south to its terminus at Pena Adobe Regional Park. A Class I bike path connects Nelson Road to Paradise Valley Road along the east side of I-80 in Fairfield. Fairfield Linear Park Trail (a multi-use trail) begins at Travis Boulevard and travels south along the west side of I-80 to its terminus at Solano Community College off Suisan Valley Road. Parks within the project limits with bicycle and/or pedestrian facilities are described in **Section 2.1.2, Parks and Recreational Facilities**.

## ENVIRONMENTAL CONSEQUENCES

### Future Year Forecasts

**Table 2.1-18** shows the overall level of traffic growth anticipated in the I-80 corridor under the 2020 and 2040 scenarios compared with existing conditions (2010). As expected, traffic entering the I-80 corridor is anticipated to increase substantially by the year 2040, largely as a result of 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 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 2.1-18 Future Traffic Growth Summary**

Scenario	Percent Growth (compared to 2010)	Annualized Growth Rate
2020 No Project	10%	1.1% per year
2020 with Project	11%	1.2% per year
2040 No Project	32%	1.1% per year
2040 with Project	35%	1.2% per year

Source: Caltrans, 2014q

### Express Lane Capacity

**Tables 2.1-19 through 2.1-22** show the forecasted available capacity of the proposed express lanes within the traffic study area of the I-80 corridor under No-Build conditions. There is substantial potential to “sell” the available express lane capacity to toll-paying single occupant vehicles. It is expected that all of the traffic study area segments with express lanes along the I-80 corridor would have significant available capacity in the opening year (2020) and in the horizon year (2040) under the No-Build Scenario. Available express lanes capacity in the opening year (2020) varies between 51 and 95 percent, and varies between 39 and 95 percent by the horizon year (2040).

**Table 2.1-19 Year 2020 AM and PM Eastbound Capacity in HOV Lanes**

Freeway Segment	Available Capacity (percent)	
	AM	PM
I-80 between Red Top Rd. and SR-12/Jameson Canyon Rd.	95%	90%
I-80 between SR-12 and I-680	88%	77%
I-80 between I-680 and Suisan Valley Rd./Pittman Rd.	84%	65%
I-80 between Suisan Valley Rd./Pittman Rd. and Truck Scale	80%	57%
I-80 between Truck Scale and SR-12	80%	57%
I-80 between SR-12 and Abernathy Rd.	78%	63%
I-80 between Abernathy Rd. and Magellan Rd.	80%	62%
I-80 between Magellan Rd. and Beck Ave.	77%	56%
I-80 between Beck Ave. and Travis Blvd.	75%	55%
I-80 between Travis Blvd. and Air Base Pkwy./N. Texas St./Waterman Blvd.	75%	51%

Source: Caltrans, 2014q

**Table 2.1-20 Year 2020 AM and PM Westbound Capacity in HOV Lanes**

Freeway Segment	Available Capacity (percent)	
	AM	PM
I-80 between Manuel Campos Pkwy./N Texas St. and Air Base Pkwy./Waterman Blvd.	83%	95%
I-80 between Air Base Pkwy./Waterman Blvd. and Travis Blvd.	70%	72%
I-80 between Travis Blvd. and W. Texas St./Rockville Rd.	62%	65%
I-80 between W. Texas St./Rockville Rd. and Abernathy Rd.	58%	66%
I-80 between Abernathy Rd. and SR-12	62%	65%
I-80 between SR-12 and Truck Scale	60%	63%
I-80 between Truck Scale and Suisun Valley Rd./Pittman Rd.	56%	65%
I-80 between Suisun Valley Rd./Pittman Rd. and I-680	52%	63%
I-80 between I-680 and Green Valley Rd.	62%	71%

Source: Caltrans, 2014q

**Table 2.1-21 Year 2040 AM and PM Eastbound Capacity in HOV Lanes**

Freeway Segment	Available Capacity (percent)	
	AM	PM
I-80 between Red Top Rd. and SR-12/I-680	90%	80%
I-80 between SR-12/I-680 and Green Valley/Lopes Rd. Off	88%	74%
I-80 between SR-12/I-680 and Green Valley/Lopes Rd. On	62%	42%
I-80 between Green Valley/Lopes Rd. and Suisun Valley Rd./Pittman Rd.	62%	43%
I-80 between Suisun Valley Rd./Pittman Rd. and Truck Scale	65%	47%
I-80 between Truck Scale and SR-12	69%	51%
I-80 between SR-12 and Abernathy Rd.	70%	52%
I-80 between Abernathy Rd. and Magellan Rd.	68%	51%
I-80 between Magellan Rd. and Beck Ave.	66%	47%
I-80 between Beck Ave. and Travis Blvd.	66%	45%
I-80 between Travis Blvd. and Air Base Pkwy./Waterman Blvd.	67%	45%
I-80 between Air Base Pkwy./Waterman Blvd. and Manuel Campos Pkwy./N Texas St.	78%	64%

Source: Caltrans, 2014q

**Table 2.1-22 Year 2040 AM and PM Westbound Capacity in HOV Lanes**

Freeway Segment	Available Capacity (percent)	
	AM	PM
I-80 between Manuel Campos Pkwy./N Texas St. and Air Base Pkwy./Waterman Blvd.	94%	95%
I-80 between Air Base Pkwy./Waterman Blvd. and Travis Blvd.	67%	71%
I-80 between Travis Blvd. and W. Texas St./Rockville Rd.	64%	67%
I-80 between W. Texas St./Rockville Rd. and Abernathy Rd.	55%	60%
I-80 between Abernathy Rd. and SR-12	52%	59%
I-80 between SR-12 and Truck Scale	49%	57%
I-80 between Truck Scale and Suisun Valley Rd./Pittman Rd.	41%	50%
I-80 between Suisun Valley Rd./Pittman Rd. and Green Valley Off	39%	50%
I-80 between Green Valley Off and I-680	53%	61%
I-80 between I-680 and Green Valley On	64%	64%
I-80 between Green Valley On and SR-12/Jameson Canyon Rd.	65%	64%

Source: Caltrans, 2014q

*Opening Year (2020) – Full Build Alternative*Peak Hour Performance

**Tables 2.1-15 and 2.1-16** summarize future mainline and ramp operations along the I-80 corridor within the traffic study area. Under 2020 conditions, the Build Alternative would improve operations along segments of the I-80 corridor relative to the No-Build Alternative. As a result of additional capacity under the Build Alternative, the following segments are expected to operate at an improved LOS when compared to the 2020 No-Build Alternative.

## AM Peak Hour Westbound I-80

- Mason Street to Air Base Parkway/Waterman Boulevard: LOS D to LOS C
- Truck Scale to Suisun Valley Road./Pittman Road: LOS E to LOS D

## AM Peak Hour Eastbound I-80

- Manuel Campos Parkway/North Texas Street to Alamo Drive: LOS C to LOS B
- Peabody Road to Monte Vista venue/Allison Drive/Nut Tree Parkway: LOS C to LOS B

#### PM Peak Hour Westbound I-80

- Mason Street to Davis Street: LOS D to LOS C
- Cherry Glen Road to Pena Adobe Road/Rivera Road/Pleasant Valley: LOS D to LOS C
- Truck Scales to Suisun Valley Road/Pittman Road: LOS D to LOS C

#### PM Peak Hour Eastbound I-80

- Abernathy Road to Magellan Road: LOS D to LOS C
- Beck Avenue to Travis Boulevard: LOS D to LOS C
- Davis Street and Monte Vista Avenue/Allison Drive/Nut Tree Parkway: LOS D to LOS C

The remainder of the I-80 corridor would operate at LOS D or better.

Under the 2020 Build Alternative, I-80 traffic congestion would be less than expected under the No-Build Alternative. I-80 queuing and congestion experienced under the 2020 No-Build Alternative on westbound I-80 near the truck scales area would be relieved with implementation of the 2020 Build Alternative.

The conversion of the HOV lane to an express lane from Red Top Road to Air Base Parkway would result in a 6 percent increase in vehicles using the express lane, which would decrease congestion in the general purpose lanes. Overall, the new express lanes would accommodate approximately 35 percent more vehicles, providing better distribution of vehicles over all the lanes, which would relieve congestion and queuing along the entirety of the I-80 study corridor. No bottlenecks are expected with implementation of the Build Alternative in opening year 2020.

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 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 express lane. During peak commute hours, 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 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 express lane. The express lane would be managed through dynamic pricing to operate at LOS C or better, with average travel speeds of 60 mph or faster.

#### Travel Time Comparison

Under the Build Alternative, I-80 traffic congestion and overall travel times in year 2020 would be less than expected under the No-Build Alternative. Overall, year 2020 travel times would be reduced by up to 30 seconds relative to the No-Build Alternative, as shown in **Table 2.1-23**. Furthermore, express lane travel times would be reduced by up to 1.9 minutes in the westbound

direction and up to 1.8 minutes in the eastbound direction during the AM peak hour, and up to 1.6 minutes in the westbound and up to 1.7 minutes in the eastbound direction in the PM peak hour (relative to the general purpose lanes).

**Table 2.1-23 Year 2020 Travel Times Summary Along the I-80 Study Corridor**

	Opening Year (2020) No Build			Opening Year (2020) West Segment			Opening Year (2020) Full Build		
	HOV Travel Time	GP Travel Time <sup>1</sup>	HOV Travel Time Savings	EL Travel Time	GP Travel Time <sup>1</sup>	EL Travel Time Savings	EL Travel Time	GP Travel Time <sup>2</sup>	EL Travel Time Savings
<b>Eastbound</b>									
AM Peak	0:06:49	0:07:48	0:00:59	0:06:48	0:07:48	0:01:00	0:13:37	0:15:23	0:01:46
PM Peak	0:07:20	0:08:56	0:01:36	0:07:20	0:08:41	0:01:21	0:14:44	0:16:38	0:01:54
<b>Westbound</b>									
AM Peak	0:06:39	0:07:38	0:00:59	0:06:38	0:07:38	0:01:00	0:14:00	0:15:38	0:01:38
PM Peak	0:06:29	0:07:23	0:00:54	0:06:29	0:07:20	0:00:51	0:13:52	0:15:14	0:01:22

Notes:

1. 1 GP travel times shown are within the limits of the existing HOV lane from Red Top Rd to Airbase Pkwy.
2. 2 GP travel times shown are within the limits of the Full Build from Red Top Rod to I-505.

Source: Caltrans, 2014q

### Volume Served

**Tables 2.1-24** and **2.1-25** show the volumes of vehicles served in the general purpose lanes along the I-80 traffic study area. Along eastbound I-80, a higher volume of vehicles would be served during both the AM peak hour and PM peak hour in 2020. Westbound I-80 is expected to accommodate similar volumes of vehicles as the No-Build Alternative, while also improving traffic operations as previously described under Peak Hour Performance.

### *Horizon Year (2040)*

### Peak Hour Performance

**Tables 2.1-24** and **2.1-25** summarize future mainline operations along I-80 within the traffic study area. Under 2040 conditions, the Build Alternative would distribute the projected increases in traffic volumes along the I-80 corridor, reduce existing congestion (described below), provide additional capacity for use by HOVs and some toll-paying single occupant vehicles, and improve overall operations of the I-80 study corridor.

The entirety of the I-80 corridor would operate at LOS D or better, and no bottlenecks are expected under the 2040 Build Alternative. The following segments are expected to operate substantially better relative to the 2040 No-Build Alternative:

#### AM Peak Hour Westbound I-80

- East Monte Vista Avenue to Mason Street: LOS D to LOS C
- Mason Street and Cherry Glen Road: LOS E to LOS D
- West Texas Street/Rockville Road and Abernathy Road: LOS E to LOS D
- SR 12 to Suisun Valley Road/Pittman Road: LOS E to LOS D

#### AM Peak Hour Eastbound I-80

- Green Valley Road/Lopes Road and Suisun Valley Road/Pittman Road: LOS C to LOS B

#### PM Peak Hour Westbound I-80

- Mason Street to Cherry Glen Road: LOS E to LOS D
- Truck Scale to Suisun Valley Road/Pittman Road: LOS E to LOS D

#### PM Peak Hour Eastbound I-80

- Beck Avenue to Travis Boulevard: LOS E to LOS D
- Manuel Campos Parkway/North Texas Street to Alamo Drive: LOS E to LOS D
- Davis Street and Peabody Road: LOS E to LOS D

Under the 2040 Build Alternative, I-80 traffic congestion would be less when compared to the No-Build Alternative. During the AM peak hour, I-80 queuing and congestion would be relieved at the following locations:

- Westbound I-80 between Mason Street and Cherry Glen Road
- Westbound I-80 between Truck Scale and Suisun Valley Road/Pittman Road
- Westbound I-80 between West Texas Street/Rockville Road and Abernathy Road
- Westbound I-80 between SR-12 and Suisun Valley Road/Pittman Road

During the PM peak hour, I-80 queuing and congestion would be relieved at the following locations:

- Westbound I-80 between Mason Street and Cherry Glen Road
- Westbound I-80 between Truck Scale and Suisun Valley Road/Pittman Road
- Eastbound I-80 between Beck Avenue and Travis Boulevard
- Eastbound I-80 between Manuel Campos Parkway/North Texas Street and Alamo Drive
- Eastbound I-80 between Davis Street and Peabody Road

**Table 2.1-24 Current and Forecasted Eastbound Mainline Volumes**

	I-80 Eastbound Location	Existing Volumes (2010)		Opening Year Volumes (2020)				Horizon Year Volumes (2040)			
		AM	PM	No Build		Build		No Build		Build	
				AM	PM	AM	PM	AM	PM	AM	PM
1	I-80 at American Canyon Rd (On)	3199	4851	3349	5514	3337	5524	4685	7323	4676	7378
2	I-80 at Red Top Rd (Off)	2940	4599	3670	5822	3314	5442	5090	7695	4573	7185
3	I-80 at Red Top Rd (On)	3222	4804	3321	5432	3655	5866	4579	7086	4945	7643
4	I-80 at SR-12/Jameson Canyon Rd (On) (*2010-2020 location)	3881	5820	3660	5856	4435	7157	--	--	--	--
5	I-80 at Green Valley Rd/I-680 (Off) (*2010-2020 location)	3266	5085	4431	7142	3632	6216	--	--	--	--
6	I-80 at Green Valley Rd/I-680 (On) (*2010-2020 location)	5076	7940	3635	6182	5452	9070	--	--	--	--
7	I-80 at I-680/Lopes Rd (Off) (*2040 location)	--	--	--	--	--	--	4953	7551	4205	6650
8	I-80 at Lopes Rd (Off)	--	---	--	--	--	--	4205	6382	3709	5929
9	I-80 at SR-12/Jameson Canyon Rd (On) (*2040 location)	--	--	--	--	--	--	3706	5550	4644	7526
10	I-80 at I-680 (On) (*2040 location)	--	--	--	--	--	--	4640	7088	6752	10324
11	I-80 at Suisun Valley Rd/Pittman Rd (Off)	4579	7350	5431	9078	4960	8316	6743	9909	5998	9109
12	I-80 at Suisun Valley Rd/Pittman Rd (On)	5075	8103	4985	8346	5467	9203	5996	8640	6396	9376
13	I-80 at SR-12 (Off)	4126	6697	5472	9203	4410	7471	6406	8942	4886	6590
14	I-80 at Abernathy Rd (Off)	4035	6569	4422	7383	4312	7338	4911	6296	4783	6457
15	I-80 at Abernathy Rd (On)	4264	7193	4340	7249	4667	8169	5015	6426	5066	7475

	I-80 Eastbound Location	Existing Volumes (2010)		Opening Year Volumes (2020)				Horizon Year Volumes (2040)			
		AM	PM	No Build		Build		No Build		Build	
				AM	PM	AM	PM	AM	PM	AM	PM
16	I-80 at West Texas St (Off)	3884	6626	4636	8069	4166	7406	5285	7352	4565	6759
17	I-80 at Magellan Rd (On)	4324	7330	4147	7142	4230	7562	4783	6633	4637	6948
18	I-80 at Beck Ave (On)	4257	7433	4211	7485	4620	8446	4855	6818	5068	7927
19	I-80 at East/West Travis Blvd (Off)	3853	6316	4605	8359	4190	7237	5286	7759	4602	6577
20	I-80 at Travis Blvd (On)	4278	7320	4185	7097	4627	8269	4828	6331	5044	7540
21	I-80 at Air Base Pkwy/Waterman Blvd (Off)	3332	6044	4621	8093	3641	6919	5265	7236	3975	5990
22	I-80 at Air Base Pkwy/Waterman Blvd (On)	4017	6779	3641	6735	4292	7693	4161	5539	4576	6818
23	I-80 at Manuel Campos Pkwy (Off)	3804	6307	4273	7365	4064	7044	4731	6253	4272	6021
24	I-80 at Manuel Campos Pkwy (On)	4311	6907	4033	6844	4683	7713	4444	5621	5217	7022
25	I-80 at Lagoon Valley Rd/Cherry Glen Rd (Off)	4278	6814	4673	7663	4650	7622	5410	6559	5184	6705
26	I-80 at Lagoon Valley Rd/Cherry Glen Rd (On)	4384	6904	4622	7546	4756	7712	5377	6137	5290	6865
27	I-80 at Pena Adobe Rd/Rivera Rd (Off)	4379	6887	4728	7636	4734	7664	5483	6563	5231	6802
28	I-80 at Pena Adobe Rd/Rivera Rd (On)	4407	6933	4704	7599	4776	7761	5426	6514	5299	6987
29	I-80 at Alamo Dr (Off)	3711	5738	4746	7695	4046	6360	5494	6716	4463	5453
30	I-80 at Alamo Dr (On)	4209	6442	4014	6302	4563	7090	4657	5214	5105	6250
31	I-80 at Davis St (Off)	3919	5929	4531	7032	4265	6547	5309	5980	4778	5480
32	I-80 at Davis St (On)	4214	6298	4233	6489	4568	6929	4986	5263	5183	5990
33	I-80 at Peabody Rd (Off)	4003	5681	4536	6871	4354	6272	5391	5703	4962	5310
34	I-80 at Peabody Rd (On)	4400	6190	4322	6217	4793	6823	5178	5114	5179	5790



	I-80 Eastbound Location	Existing Volumes (2010)		Opening Year Volumes (2020)				Horizon Year Volumes (2040)			
		AM	PM	No Build		Build		No Build		Build	
				AM	PM	AM	PM	AM	PM	AM	PM
35	I-80 at Monte Vista Ave/Allison Dr/Nut Tree Pkwy (Off)	4181	4920	4760	6768	4544	5516	5390	5606	4876	4371
36	I-80 at Monte Vista Ave/Allison Dr/Nut Tree Pkwy (On1)	4395	5141	4523	5444	4728	5741	5090	4206	5260	4955
37	I-80 at Monte Vista Ave/Allison Dr/Nut Tree Pkwy (On2)	4502	5276	4712	5670	4912	5967	--	--	--	--
38	I-80 at I-505/Orange Dr (Off)	3720	4554	4901	5896	4120	5214	5482	4877	4446	4162
39	I-80 at I-505/Orange Dr (On)	3787	4706	4101	5156	4198	5408	4665	4131	4648	4508
40	I-80 at Nut Tree/Orange Dr (On)	3951	5087	4179	5350	4378	5851	4864	4568	4940	5056
41	I-80 at Leisure Town Rd (Off)	3633	4699	4359	5793	3910	5171	5157	5132	4160	4127

Source: Caltrans, 2014q

**Table 2.1-25 Current and Forecasted Westbound Mainline Volumes**

	I-80 Westbound Location	Existing Volumes (2010)		Opening Year Volumes (2020)				Horizon Year Volumes (2040)			
		AM	PM	No Build		Build		No Build		Build	
				AM	PM	AM	PM	AM	PM	AM	PM
1	I-80 at Leisure Town Rd. (On)	4012	4595	4204	4458	4204	4462	4792	5216	4843	5398
2	I-80 at I-505 (Off)	3992	4576	4462	5062	4442	5045	5218	6177	5246	6346
3	I-80 at I-505 (On)	4759	5539	4441	5040	5440	6136	5198	6158	6709	7633
4	I-80 at Monte Vista Ave/Allison Dr (Off)	4488	4985	5434	6131	5158	5580	6645	7429	6075	7041
5	I-80 at Monte Vista Ave/Allison Dr (On)	5251	5614	5157	5575	5913	6273	6326	6834	6828	7800
6	I-80 at Mason St (Off)	4740	4976	5913	6268	5364	5601	7140	7491	6136	7286
7	I-80 at Mason St (On)	5557	5445	5378	5596	6218	6104	6612	7086	6908	7789
8	I-80 at Davis St (Off)	5175	5091	6229	6100	5826	5738	7371	7595	6455	7298
9	I-80 at Davis St (On)	5604	5402	5827	5734	6384	6067	6920	7132	7300	7724
10	I-80 at Alamo Dr (Off)	5092	4812	6383	6062	5856	5464	7659	7542	6725	6985
11	I-80 at Alamo Dr (On)	6542	5542	5867	5459	7336	6295	7087	6849	8304	8008
12	I-80 at Cherry Glen Road (Off)	6533	5524	7345	6289	7318	6294	8595	7817	8304	8008
13	I-80 at Pena Adobe Rd/Rivera Rd (Off)	6518	5481	7344	6288	7283	6195	8595	7817	8201	7825
14	I-80 at Pena Adobe Rd/Rivera Rd (On)	6527	5509	7293	6188	7297	6233	8493	7637	8353	7907
15	I-80 at Cherry Glen Rd/Lagoon Valley Rd (Off)	6519	5487	7306	6226	7177	6046	8557	7729	8028	7442
16	I-80 at Cherry Glen Rd/Lagoon Valley Rd (On)	6657	5535	7191	6039	7398	6241	8234	7265	8418	7905
17	I-80 at Manuel Campos Pkwy (Off)	6087	4944	7412	6235	6844	5558	8759	7731	7586	6923

	I-80 Westbound Location	Existing Volumes (2010)		Opening Year Volumes (2020)				Horizon Year Volumes (2040)			
		AM	PM	No Build		Build		No Build		Build	
				AM	PM	AM	PM	AM	PM	AM	PM
18	I-80 at Manuel Campos Pkwy (On)	6630	5219	6710	5553	7508	5880	7846	6656	8463	7341
19	I-80 at Air Base Pkwy/Waterman Blvd (Off 1)	6353	4904	7354	5872	7213	5555	8478	7046	8161	6984
20	I-80 at Air Base Pkwy/Waterman Blvd (Off 2)	6102	4579	7071	5548	6853	5319	8191	6710	7881	6763
21	I-80 at Air Base Pkwy/Waterman Blvd (On)	7402	5612	6827	5315	8189	6410	8058	6664	9239	7970
22	I-80 at Travis Blvd (Off)	6852	4877	8159	6410	7410	5661	9534	7876	8696	7227
23	I-80 at Travis Blvd (On 1)	7247	5572	7411	5663	7869	6400	9065	7147	9328	8006
24	I-80 at Travis Blvd (On 2)	7650	5877	7853	6401	8339	6722	9757	7924	9853	8364
25	I-80 at West Texas St/Rockville Rd (Off)	7030	5383	8298	6722	7814	6337	10274	8283	9098	7755
26	I-80 at West Texas St/Rockville Rd (On)	7656	5777	7790	6337	8683	6771	9570	7674	9628	8200
27	I-80 at Abernathy Rd (Off)	6864	5456	8558	6771	7674	6387	10128	8107	8304	7623
28	I-80 at Abernathy Rd (On)	7029	5544	7583	6386	7851	6475	8841	7566	8586	7711
29	I-80 at SR-12 (On)	8662	6652	7755	6474	9734	7870	9121	7661	11307	9909
30	I-80 at Suisun Valley Rd/Pittman Rd (Off)	7880	5877	9666	7869	8875	6857	11878	9875	11066	8928
31	I-80 at Suisun Valley Rd/Pittman Rd (On)	--	--	--	--	--	--	11617	8901	11955	10069
32	I-80 at Green Valley Rd (Off)	--	--	--	--	6540	5142	12370	10031	11490	9761
33	I-80 at I-680 (Off) (*2010-2020 location)	5694	4268	8832	6855						
34	I-80 at I-680 (On) (*2010-2020	5845	4436	6533	5141						

	I-80 Westbound Location	Existing Volumes (2010)		Opening Year Volumes (2020)				Horizon Year Volumes (2040)			
		AM	PM	No Build		Build		No Build		Build	
				AM	PM	AM	PM	AM	PM	AM	PM
	location)										
35	I-80 at Jameson Canyon Rd/SR-12 (Off) (*2020 location)	4904	4061	7078	5537						
36	I-80 at Green Valley Rd (On) (*2020-2040 location)	--	--	5454	4264	7052	5550	7056	6475	7162	7026
37	I-80 at Green Valley Rd/I-680 (Off)	--	--	--		5436	4277	--	--	--	--
38	I-80 at Jameson Canyon Rd/SR-12 (Off) (*2040 location)	--	--	--	--	--	--	11926	9725	9604	8642
39	I-80 at Jameson Canyon Rd/SR-12 (On)	--	--	--	--	6119	4989	--	--	--	--
40	I-80 at I-680 (Off) (*2040 location)	--	--	--	--	--	--	10030	8579	6630	6552
41	I-80 at I-680 (On) (*2040 location)	--	--	--	--	--	--	7665	6961	7455	7213
42	I-80 at Red Top Rd (Off)	4256	3852	6054	4976	5414	4725	7960	7140	6729	6703
43	I-80 at Red Top Rd (On)	4630	4070	5346	4712	5803	5041	7242	6630	7061	7166
44	I-80 at American Canyon Rd (Off)	4413	3771	5707	5023	5611	4711	7641	7103	6860	6784

Source: Parsons Brinckerhoff, 2014

By year 2040, the conversion of the HOV lane in the West Segment to an express lanes results in a 9 percent increase in vehicles using the express lane, which would decrease congestion in the general purpose lanes. The additional lane in the East Segment would accommodate approximately 35 percent more vehicles, resulting in increased capacity and decreased congestion along the I-80 study corridor.

### Travel Time Comparison

Overall, travel times would be reduced by up to 27 seconds relative to the 2040 No-Build Alternative, as shown in **Table 2.1-26**. Relative to general purpose lanes, express lane travel times would be reduced by up to 1.5 minutes in the eastbound and westbound directions in the AM peak hour. During the PM peak hour, there would be a travel time savings of up to 1.3 minutes in the westbound direction and up to 1.9 minutes in the eastbound direction, relative to the general purpose lanes.

**Table 2.1-26 Year 2040 Travel Times Summary Along the I-80 Study Corridor**

	Horizon Year (2040) No Build			Horizon Year (2040) Full Build		
	HOV Travel Time	GP Travel Time <sup>1</sup>	HOV Travel Time Savings	EL Travel Time	GP Travel Time <sup>2</sup>	EL Travel Time Savings
<b>Eastbound</b>						
AM Peak	0:07:14	0:07:57	0:00:43	0:14:11	0:15:42	0:01:31
PM Peak	0:07:31	0:08:52	0:01:21	0:15:04	0:16:57	0:01:53
<b>Westbound</b>						
AM Peak	0:07:05	0:08:20	0:01:15	0:14:35	0:16:06	0:01:31
PM Peak	0:06:59	0:07:56	0:00:57	0:14:38	0:15:59	0:01:21

Notes:

1. 1 GP travel times shown are within the limits of the existing HOV lane from Red Top Rd to Airbase Pkwy.
2. 2 GP travel times shown are within the limits of the Full Build from Red Top Rod to I-505.

Source: Caltrans, 2014q

### Volume Served

**Tables 2.1-24 and 2.1-25** above summarize east and westbound traffic volumes for the weekday AM peak hour and PM peak hour. During the PM peak hour, the Build Alternative would accommodate increased volumes along both eastbound and westbound I-80 while also improving traffic operations in 2040. During the AM peak hour, eastbound and westbound I-80 would accommodate similar traffic volumes as the No-Build Alternative, but would improve traffic operations as previously discussed under *Peak Hour Performance*.

### *Bicycle and Pedestrian Facilities*

The Build Alternative would not alter the existing bicycle and pedestrian facilities.

#### **West Segment – First Fundable Phase**

In general, the traffic conditions detailed above for the Build Alternative are applicable to the West Segment. Implementation of the West Segment, with or without the future phases of the Build Alternative, would result in more efficient operations of the I-80 corridor relative to the No-Build Alternative conditions.

### *Opening Year (2020) – West Segment*

#### Peak Hour Performance

Under 2020 conditions, the implementation of the West Segment would have very similar effects on I-80 corridor-wide traffic operations when compared to the full Build Alternative (see **Table 2.1-23**). Under 2020 conditions, the West Segment would improve the operations along the I-80 study corridor when compared to the No-Build Alternative. The following I-80 segments would experience improved LOS operations relative to the 2020 No-Build Alternative:

#### AM Peak Hour Westbound I-80

- Truck Scale to Suisun Valley Road/Pittman Road: LOS E to LOS D

#### PM Peak Hour Westbound I-80

- Mason Street to Davis Street: LOS D to LOS C
- Truck Scale to Suisun Valley Road/Pittman Road: LOS D to LOS C

#### PM Peak Hour Eastbound I-80

- Abernathy Road to Magellan Road: LOS D to LOS C
- Beck Avenue to Travis Boulevard: LOS D to LOS C

#### Travel Time Comparison

The overall travel time savings with the construction of the West Segment are minimal, up to 14 seconds, when compared to the 2020 No Build Alternative. However, when compared to the general purpose lanes, there is expected to be an express lane travel saving of up to 1 minute in the westbound and eastbound directions during the AM peak hour. During the PM peak hour, there is anticipated to be travel time savings of up to 0.9 minutes westbound and 1.4 minutes in eastbound direction.

### Volume Served

Westbound I-80 is expected to accommodate similar volumes of vehicles as the No-Build Alternative, while also improving traffic operations as previously described under *Peak Hour Performance*. Approximately 8 percent more vehicles are expected to use the express lane by year 2020 with the construction of the West Segment, enabling better distribution of vehicles throughout all freeway lanes and relieving congestion. The queuing and congestion experienced on westbound I-80 near the truck scales area would be relieved. .

### *Horizon Year (2040) – West Segment*

By year 2040, both the West and East Segments are anticipated to be complete. For this reason, the West Segment was not further evaluated for 2040 conditions and construction of the West Segment would be identical to 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. As further discussed in **Section 2.1.2, Parks and Recreation**, the bike paths and bike lanes located adjacent to I-80, and at the various ramp termini intersections, would remain open during construction and would not be impacted as part of the Build Alternative.

### **No-Build Alternative**

As presented in the analyses above (see **Tables 2.1-24 and 2.1-25**), the forecasted increases in traffic volumes without capacity improvements would result in further deterioration in traffic congestion and slower vehicle speeds along I-80. By year 2020, average travel times along the I-80 study corridor are anticipated to increase by as much as almost 1.5 minutes (refer to **Table 2.1-23**).

Traffic congestion would continue to increase between the I-680 and SR 12 East Interchanges, between the SR 12 West Interchange and Red Top Road, and between Travis Boulevard and Lagoon Valley Road/Cherry Glen Road. Speeds in some segments would drop to as low as 49 mph.

By 2040 with no improvements, several segments of the I-80 corridor are expected to deteriorate to unacceptable LOS E conditions, with speeds as low as 47 mph in some locations. These segments would experience increased congestion in the general purpose lanes, particularly between Beck Avenue and Travis Boulevard, and from Manuel Campos Parkway to Peabody Road during the PM peak hour eastbound. Traffic would also worsen between Mason Street and Cherry Glen Road during both the AM peak hour and PM peak hour in the westbound direction, and between West Texas Street and Suisun Valley Road during the AM peak hour westbound. Under the No-Build Alternative, average travel times along the I-80 study corridor are anticipated to increase by over 1.5 minutes by 2040 (refer to **Table 2.1-26**).

## 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.

### West Segment –Fundable First Phase

No avoidance, minimization, or mitigation measures specific to the West Segment 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 of 1969 as amended (NEPA) establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically (emphasis added) and culturally pleasing surroundings (42 United States Code [USC] 4331[b][2]). To further emphasize this point, the Federal Highway Administration (FHWA) in its implementation of NEPA (23 USC 109[h]) directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

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



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  $\geq$  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.

## STATE POLICIES AND GUIDELINES

No officially designated state scenic highways or highways eligible for such designation are within the project limits. The following segments of the project limits are classified Landscaped Freeways and are located within Fairfield (Caltrans, 2014r).<sup>29</sup>

- I-80 from PM 15.52 to 15.90
- I-80 from PM 16.04 to 16.27
- I-80 from PM 17.03 to 19.71

The designated Landscaped Freeway locations between PM 15.52 and 16.27 are located between the Cordelia Truck Scales and Abernathy Road overcrossing. The designated Landscaped Freeway location between 17.03 and 19.71 is located from just west of the West Texas Street undercrossing to the Air Base Parkway overcrossing.

## 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 Solano County General Plan Resources Element identifies the I-80 corridor as a scenic roadway and directs roadway corridors to be developed in a manner that respects and maintains the integrity of the viewsheds identified in the plan.<sup>30</sup> Guiding policies and implementation programs are established to implement this direction. Specifically, Guiding Policies RS.P-35 – 37 include

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<sup>29</sup> Criteria for Landscaped Freeways include freeways with plantings within the state right-of-way that are continuous (no gaps  $\geq$  200 feet), ornamental (not functional), a least 1,000 feet long, on at least one side of the freeway, and require reasonable maintenance.

<sup>30</sup> *Solano County General Plan*, Chapter 4, Resources, 2008; RS-37-39, 50.

direction to protect the visual character and unique scenic features including roadways, hills, ridgelines, wetlands, and water bodies. Implementation programs RS.1-21, 22 and 36 provide design treatments to preserve the visual character of scenic roadways.

The Fairfield Scenic Vista and Roadway Plan identifies scenic vistas and establishes policies and guidelines to minimize the impact on scenic vistas and roadways. Different from a scenic roadway, a scenic vista is an attractive area that is visible from a number of places around Fairfield.<sup>31</sup> The plan incorporates concepts of vividness, intactness, and unity to identify natural features and built features that contribute to an area's scenic quality. The City of Fairfield utilizes Scenic Vistas policies in their development review.<sup>32</sup> Although the I-80 corridor is not identified as a scenic roadway, there are several scenic vista areas and scenic vista points have been identified in areas immediately adjacent to the project limits.

The Fairfield General Plan includes a combined open space, conservation, and recreation element. Many of the open space policies directly relate to policies in the Urban Design Element of the General Plan, which identifies objectives and policies to foster an attractive, orderly, and unique community while preserving the natural setting. Specifically, Objective OS 6 and associated Policies OS 6.1, 6.5, 6.6 and 6.9 within the Open Space, Conservation, and Recreation Element aim to enhance visual resources throughout the City. Within the Urban Design Element, Objectives UD 1, UD 4, UD 5 and UD 6 and their associated policies UD 1.4, UD 4.2, UD 5.1, UD 5.2 and UD 6.1 (respectively) provide development and landscaping design direction to cultivate Fairfield as a distinctive community, ensure high quality standards, and preserve the natural scenic quality of the surrounding setting. Fairfield has not designated any portion of the I-80 corridor (within city limits) as a scenic resource.

The City of Vacaville's General Plan includes an Open Space Element and a Conservation Element, both of which have guiding principles and implementing policies relating to visual resources within the project limits. The Open Space Element includes policies 3.5-G 2 and 3.5 I 5 which require retention of major ridgelines and hillsides designated as open space areas and minimization of construction disturbance activities of natural habitats and vegetation. The Conservation Element includes policies 8.1 G1 and 8.2 G1 which aims to preserve and enhance Vacaville's creeks and natural environments for their value as habitat, drainage, and visual amenities.

The City of Vacaville's City Gateways Plan was created with the intention to improve the visual appearance of the City from I-80 and the "gateways" into the community. The City Gateways Plan generally focuses on the area of I-80 between Lagoon Valley Road and Leisure Town Road, including 100 feet from the existing freeway right-of-way line. The City Gateways Plan also provides design elements with specific materials and guidance for landscaping, public art, interchanges and overcrossings, public signage, billboard removal, and undergrounding of utilities. The City Gateways Plan specifically recognizes the aesthetic importance of the oleanders in the I-80 highway median and calls for them to be maintained and enhanced whenever possible.

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31 City of Fairfield Scenic Roadways and Vistas Plan, 1999

32 City of Fairfield, Scenic Vistas and Roadways Plan, 1999.

## AFFECTED ENVIRONMENT

Information in this section is based on the Visual Impact Assessment prepared for this project (Caltrans 2014r). 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, key views and the types of viewers in the visual resources study area.

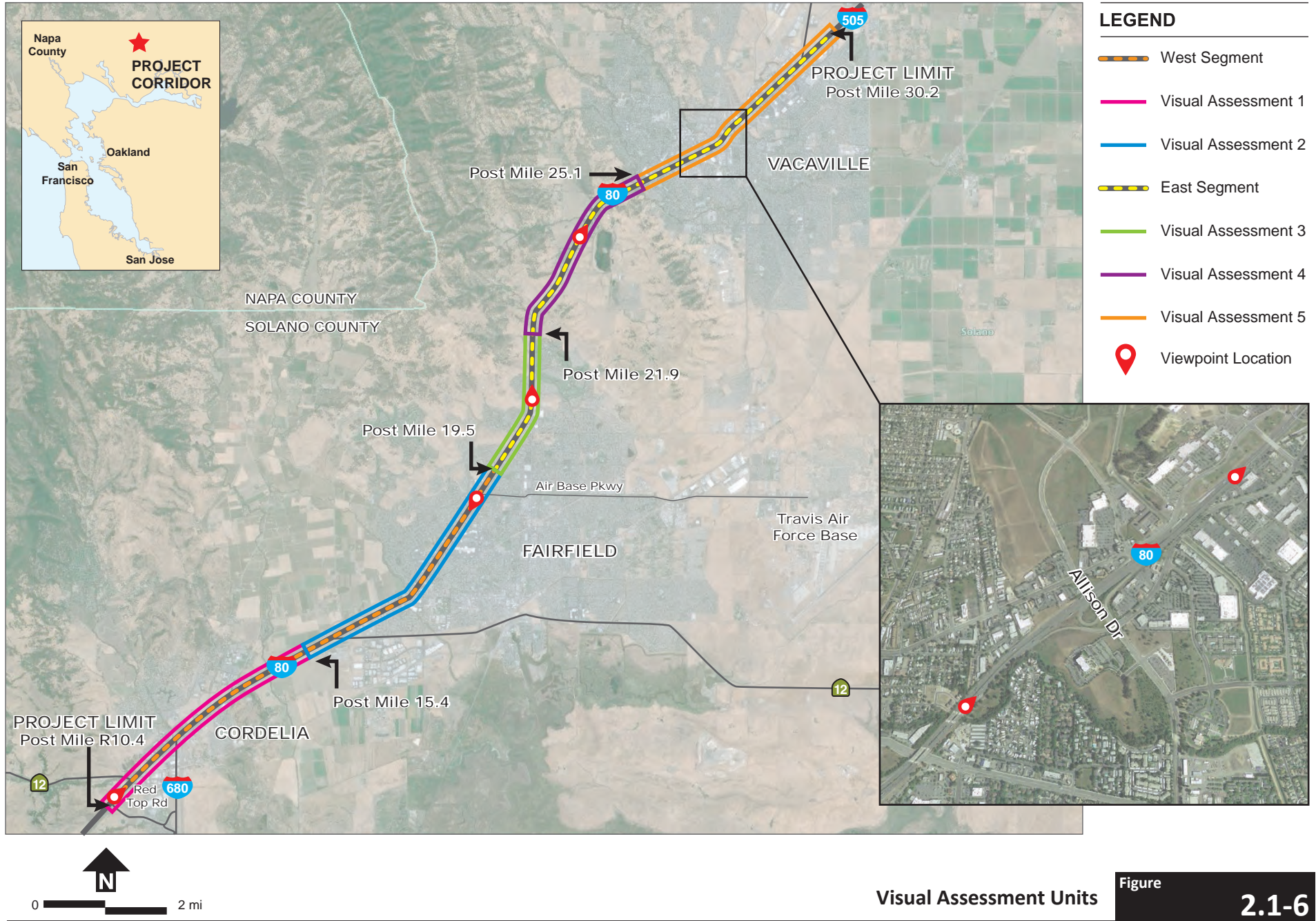
### Visual Setting

The visual setting and visual quality of the study area can be described by five 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-2.1-6** depicts the location of these visual assessment units.

The immediate vicinity of the visual resources study area consists primarily of urban development through the cities of Fairfield and Vacaville and open hilly terrain in the unincorporated Solano County area. Urban development includes commercial and residential development, farms and farmhouses, and the I-80 freeway corridor. Landforms within the project limits are generally characterized by commercial and residential neighborhoods, farmland, and rural valley terrain. Natural land cover in the project area includes trees, shrubs, and grassland vegetation.

#### *Visual Assessment Unit 1*

Visual Assessment Unit 1 is located from the southwestern-most project limit, west of Red Top Road (PM R10.4) to the Rio Vista/SR 12 exit (PM 15.4). The character of Visual Assessment Unit 1 is a transportation corridor through mostly flat and open terrain with low hills in the western portion and farmland in the eastern portion. Low trees and vegetation line the valley and are scattered on the nearby hillsides which are crossed by power lines. Views of man-made development through the area of Cordelia generally consist of large-scale commercial buildings such as warehouses, retailers, and strip malls, and business parks with tall signs, and are softened by planted trees and landscaping. Eastbound traveler groups along this corridor experience views of rolling hills and layered mountain ranges in the distance in the undeveloped areas. Westbound traveler groups experience similar views as travelers in the eastbound direction, but with closer views of rolling hills. There are 23 existing overhead freeway signs in the eastbound direction, and 18 in the westbound direction within Visual Assessment Unit 1. Visual Assessment Unit 1 is part of the West Segment of the project.



Source: Caltrans, 2014x [VIA]

This mixture of natural landscape and man-made development creates a quality similar to other urban limits in the region and is of moderate, overall visual quality. This mixture degrades the intactness of the natural environment to moderately-low. The scattered developments geared toward freeway travelers are not particularly vivid. However, views of rolling hills and distant mountain ranges increase vividness to moderately high for viewers. While some developments intrude on the natural environment, others are in harmony with the rural landscape. Thus, the lack of any major visual intrusions results in moderate unity.

#### *Visual Assessment Unit 2*

Visual Assessment Unit 2 is located from the Rio Vista/SR 12 exit (PM 15.4) to just east of Air Base Parkway (PM 19.5). The character of Visual Assessment Unit 2 is a relatively flat transportation corridor shouldered by a concrete-median barrier, soundwalls, and trees that provide it lineal definition. It is surrounded by mostly low-density commercial and residential development partially screened by trees and landscaping, with some farmland in the western portion which creates diverse patterns and textures. The freeway corridor and open sky dominate the view in this unit, as mountains are distant and partially obscured. Eastbound traveler groups along this corridor experience intermittent long-range views of the Vaca Mountain range between developments and greenery partially obstructed by a tall median barrier and trees in some portions of the unit. Westbound traveler groups travel on a slight downslope and experience distant views of mountain ranges in the direction of travel surrounded by low-density commercial and residential developments broken up by greenery. There are 11 existing overhead signs in the eastbound direction, and 10 in the westbound direction. Visual Assessment Unit 2 is part of the West Segment of the project.

Visual Assessment Unit 2 includes a moderate amount of man-made development, with a mixture of residential, commercial, and industrial land uses. Near-range views consist of a variety of commercial developments surrounded by large parking lots, tall trees, and soundwalls with landscaping. With intermittent long-range views of mountains, vividness in this unit is moderate. The man-made developments are generally low-density and partially or completely screened by landscaping or soundwalls, allowing for some long-range views to remain. This results in relatively moderate visual continuity and moderate-high intactness and unity ratings. Visual Assessment Unit 2 represents a moderate-high visual quality rating.

#### *Visual Assessment Unit 3*

Visual Assessment Unit 3 is located just east of Air Base Parkway (PM 19.5) to the eastern edge of Paradise Valley Golf Course (PM 21.9). The character of Visual Assessment Unit 3 is a transportation corridor surrounded by rolling hills. Travelers pass by low-density residential development and some commercial development that is partially screened by trees and soundwalls. After Putah South Canal, the views are mostly open and natural and the median is planted with oleanders that bloom with pink and white flowers in the summer and are green in the winter. There is also a golf course on the south side of Visual Assessment Unit 3 that is lined with tall



evergreen trees. Traveler groups along this corridor experience scenic views of natural appearing hills and vegetation. There are no existing overhead signs in Visual Assessment Unit 3. Visual Assessment Unit 3 is within the East Segment of the project.

Visual Assessment Unit 3 is surrounded by rolling hills with some low-density residential and commercial development that is partially screened by trees and soundwalls. The hill passages and natural land cover are visually striking to travelers, resulting in moderate-high vividness. Oleanders planted in the freeway median provide colorful blooms in the summer and greenery in the winter; however, the white concrete safety barriers bordering the oleanders diminish the aesthetic of the plants. Depending on the scale, some of the development and landscaping blend well with the natural environment and others encroach on or obscure the scenery. Intactness and unity in Visual Assessment Unit 3 are moderate. Overall, Visual Assessment Unit 3 represents a moderate visual quality rating.

#### *Visual Assessment Unit 4*

Visual Assessment Unit 4 is located from the eastern edge of the Paradise Valley Golf Course (PM 21.9) to Alamo Creek (PM 25.1). The character of Visual Assessment Unit 4 is a transportation corridor through a natural setting of rolling hills, farmland, and intermittent median and shoulder oleander plantings. The Cement Hill Range Scenic Vista, agricultural lands, the Peña Adobe Park, and Lagoon Valley Lake can be viewed from certain areas within this visual assessment unit.

The Peña Adobe Park and Ranchotel Motel are the main highway neighbors in Visual Assessment Unit 4. There are currently no views of I-80 from the Peña Adobe Park and lightly screened views of I-80 from the Ranchotel Motel. Throughout most of Visual Assessment Unit 4, the westbound side of the freeway is at a higher grade separation than the eastbound side, thus screening views of the eastbound lanes from westbound travelers. Visual Assessment Unit 4 has one existing overhead sign in the eastbound direction and none in the westbound direction. All other freeway signs in this unit are smaller, post-mounted types. Existing trees and vegetation occur within the median and freeway shoulder which contribute to softening of the existing I-80 infrastructure. Visual Assessment Unit 4 is within the East Segment of the Project.

Visual Assessment Unit 4 is mostly rural with few man-made features that blend nicely with the natural environment, creating high vividness. Tall landscaping obscures the views in some locations and detracts slightly from the intactness and unity of the scenery. Oleanders planted in the freeway median provide colorful blooms in the summer and greenery in the winter; however, the white concrete safety barriers bordering the oleanders diminish the aesthetic of the plants.

Overall, the rural character and natural surroundings of the landscape is visually appealing to travelers, resulting in high intactness and unity. Overall, Visual Assessment Unit 4 represents a high visual quality rating.

### *Visual Assessment Unit 5*

Visual Assessment Unit 5 is located from Alamo Creek (PM 25.1) to just past Leisure Town Road (PM 30.2). Visual Assessment Unit 5 is characterized as a relatively flat transportation corridor through the developed area of the City of Vacaville. Tall trees line much of the freeway, screening a considerable amount of the commercial and residential development. Eastbound traveler groups experience views of dense trees and landscaping and minimal long-range mountain views. Westbound traveler groups experience more long-range mountain views of the Cement Hill Range Scenic Vista and the Vaca Mountains. Tall commercial signs mark the landscape through the I-80 corridor. Median planted oleanders are generally tall and full in this area. There are 11 existing overhead signs in the eastbound direction of Visual Assessment Unit 5, and 7 overhead signs in the westbound direction. Visual Assessment Unit 5 is within the East Segment of the Project.

Visual Assessment Unit 5 is highly developed. This development is mostly screened by dense landscaping along the freeway corridor. Long-range views of the Vaca Mountain ranges are visible to westbound travelers. Planted trees and oleanders are colorful and pleasant, while tall signs detract from the visual quality, resulting in moderate vividness. Oleanders planted in the median provide colorful blooms in the summer and greenery in the winter; however, the white concrete safety barriers bordering oleanders diminish the aesthetic of the plants. Frequent signage and visual clutter obstructing long-range views results in moderate-low intactness. Relatively consistent lush roadside landscaping provides moderate unity. Overall, Visual Assessment Unit 5 represents a moderate visual quality rating.

### **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 and agricultural businesses along the project limits. These viewer groups fall into two major categories: highway neighbors and highway users. Highway neighbors are people who have views *to* the road and can be divided up into viewer groups by land use type. Highway users are people who have views *from* the road and can be divided by reason for travel. 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.<sup>33</sup>

#### *Highway Neighbors*

Highway neighbors for the visual resources study area include several residential neighborhoods, commercial/industrial uses including a number of hotels, businesses, restaurants, agricultural and farmlands and two recreational bicycle and pedestrian paths. All neighbors have a moderate

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<sup>33</sup> Viewer exposure is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: location, quantity, and duration. Viewer sensitivity is a measure of the viewer's recognition of a particular object and has three attributes: activity, awareness, and local values.

viewer exposure and sensitivity; although within Visual Assessment Units 4 and 5 their sensitivity would be high due to the local value placed on the median oleanders outlined in the City of Vacaville's City Gateways Plan.

Residential highway neighbors along the visual resources study area have limited views of the freeway, and have very low visual exposure. For the majority of residential highway neighbors, views of I-80 are blocked by soundwalls, trees, and shrubs; while some residential highway neighbors are blocked from views of the freeway because they are situated at a lower topography than the freeway. Residential highway neighbors have higher viewer sensitivity due to prolonged and ongoing views.

Commercial and industrial highway neighbors have higher views of I-80 than the residential highway neighbors, due to a lesser amount of visual screening. Patrons of these commercial and industrial uses may have temporarily higher view exposure when using the associated parking lots which generally have the most exposed views to I-80. However, this in turn results in lower viewer sensitivity because views from the parking lots and/or hotel rooms do not occur over a prolonged duration.

Agricultural, farmlands, and recreational highway neighbors have moderate to high views and exposure. In areas without landscaping to screen views, these highway neighbors may have prolonged views of the I-80 corridor. Because agricultural viewers only have close views of the freeway when they are working in the areas near the I-80, sensitivity would be low.

Recreational bicycle and pedestrian trail viewers would have moderate-high sensitivity due to prolonged views and high values of the natural scenery. Viewers from the Scandia Family Fun Center, a commercial recreational use, are generally focusing on various activities that would take their awareness away from the freeway and would thus have moderate-low sensitivity.

#### *Highway Users*

Highway users for the visual resources study area include commuter, hauler, tourist and local resident travelers. There are a wide variety of views from the freeway throughout the visual resources study area, including open views of rolling hills with scattered low-density development, trees and soundwalls that enclose the freeway and screen travelers from views of residential and commercial developments, natural land cover and greenery, and frequent commercial and overhead roadway signs. Overall, highway users have a moderate-high viewer exposure and sensitivity; although within Visual Assessment Units 4 and 5 sensitivity would be high due to the local value placed on the median oleanders outlined in the City of Vacaville's City Gateways Plan.

There is a high quantity of highway users per day in this portion of the project limits with a general high visual exposure to non-peripheral, repetitive objects (i.e., signs and lane striping), and distant views. However, highway users that are commuting to and from work on a routine basis are less aware and have a lower sensitivity to visual resources than the highway users that are driving to



enjoy the scenic views.<sup>34</sup> Drivers traveling along at normal speeds typically focus their attention on long-range, non-peripheral views. Passengers would likely have a heightened awareness of a wide range of views while traveling, since they are not focused on the task of driving. Motorists traveling at normal highway speeds would have a much shorter duration of view than motorists driving slowly due to congested traffic. Motorists experiencing congested traffic conditions would be likely to focus on views of the existing highway and the traffic in front of them. Motorists and passengers are more aware of views when the landscape transitions and may have a higher sensitivity. Overall, highway users would have a moderate-high response to changes within the project limits; although within Visual Assessment Units 4 and 5 their response would be high due to high sensitivity associated with the median oleanders.

## ENVIRONMENTAL CONSEQUENCES

### Build Alternative

Six viewpoints were selected to represent existing views from the I-80 corridor. These viewpoints best represent the visual character and quality and/or the unique visual resources of each Visual Assessment Unit, respectively. Visual Assessment Unit 5 included two viewpoints. Visual simulations were prepared at three viewpoint locations to illustrate the future improvements under the Build Alternative.

The three visual simulations of the Build Alternative were prepared in locations where the project components are anticipated to result in a moderate level of change to the existing visual setting. The locations of the visual simulations are generally representative of the study area. The visual impact for each of the five viewpoints is determined by combining the viewer response and the resource change, as shown in **Table 2.1-27**.

**Table 2.1-27 Summary of Visual Impacts**

Visual Unit	Build Alternative			No Build Alternative		
	Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
<b>West Segment</b>						
1	Low	Moderate	Moderate-Low	No Change	No Change	No Change
2	Low	Moderate-High	Moderate	No Change	No Change	No Change
<b>East Segment</b>						
3	Moderate-Low	Moderate-High	Moderate	No Change	No Change	No Change
4	Moderate-High	High	High	No Change	No Change	No Change

<sup>34</sup> Caltrans, Visual Character Lesson 10: Viewers, Accessed July 8, 2014 from [http://www.dot.ca.gov/hq/LandArch/via\\_training/mod\\_2/mod\\_02\\_less\\_10.htm](http://www.dot.ca.gov/hq/LandArch/via_training/mod_2/mod_02_less_10.htm).

Visual Unit	Build Alternative			No Build Alternative		
	Resource Change	Viewer Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
5	Moderate-High	High	High	No Change	No Change	No Change

Source: Caltrans, 2014r

### *Visual Assessment Unit 1*

Viewpoint 1, looking east from the center northbound I-80 lane approximately 0.7 miles west of Red Top Road, represents the typical visual character of Visual Assessment Unit 1 as shown in **Figure 2.1-7**. The existing classified Landscaped Freeway in Visual Assessment Unit 1 begins in Fairfield from south end of the project limits (PM 15.52) and encroaches slightly into Visual Assessment Unit 2 to the north (PM 15.90). Implementation of the Build Alternative would not change the classified Landscaped Freeway status in these areas as the landscaping within the Caltrans right-of-way would generally remain continuous as only approximately twenty linear feet would be removed.

Under the Build Alternative, primary improvements within Visual Assessment Unit 1 would be of similar type and appearance to features of the existing I-80 corridor, resulting in a low resource change that would not substantially alter the existing moderate visual character and quality. New overhead signs would be located in the median which would occupy more of the central portion of a motorist's field of vision as compared to the existing roadside overhead signs. While highway users would have a moderate-high response to these resource changes, there are no highway neighbors with views of these changes. The moderate viewer response, coupled with a low resource change results in the Build Alternative having a moderate-low visual impact for Visual Assessment Unit 1.

The visual quality/resource change for Visual Assessment Unit 1 is summarized in **Table 2.1-28**.

**Table 2.1-28 Visual Quality Change from Visual Assessment Unit 1**

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

Source: Caltrans, 2014r

*Visual Assessment Unit 2*

Viewpoint 2, looking west from the center northbound I-80 lane between Air Base Parkway and Travis Boulevard, represents the typical visual character of Visual Assessment Unit 2 as shown in **Figure 2.1-7**. Three sections of existing classified Landscaped Freeways occur in Visual Assessment Unit 2 and are located in Fairfield. A portion of a Landscaped Freeway (from PM 15.4 to 15.9) is included at the southern end of Visual Assessment Unit 2. An additional classified Landscaped Freeway also exists slightly north from PM 16.04 to 16.27. These Landscaped Freeways are located between the Cordelia Truck Scales and Abernathy Road overcrossing. Implementation of the Build Alternative would not change the classified Landscaped Freeway status in either area as the landscaping within the Caltrans right-of-way would remain substantially continuous; a total of only 20 lineal feet of tree removal is anticipated. The third portion of an existing Landscaped Freeway occurs at the northern boundary of Visual Assessment Unit 2 (PM 17.03) and encroaches slightly into Visual Assessment Unit 3 (PM 19.71) to the north. Implementation of the Build Alternative would not change the classified Landscaped Freeway status in this area as no vegetation or tree removal is anticipated that would create gaps in vegetation greater than 200 feet.

Under the Build Alternative, primary improvements within Visual Assessment Unit 2 would be of similar type and appearance to features of the existing I-80 corridor resulting in a low resource change that would not substantially alter the existing moderate visual character and quality.

New express lane signs would disrupt views of the landscape and intermittent long range views of the Vaca Mountain Range which contribute to a reduction in the overall visual quality from moderate-high to moderate in Visual Assessment Unit 2. Viewer response from highway neighbors would be moderate-high as existing views are generally limited. Viewer response from highway users would be moderate-high as regionally valued views would generally not be obstructed and new overhead signage would be similar to existing, visible overhead signage. The moderate-high viewer response, coupled with the low resource change results in the Build Alternative having a moderate visual impact for Visual Assessment Unit 2.

The visual quality/resource change for Visual Assessment Unit 2 is summarized in **Table 2.1-29**.

**Viewpoint 1, Existing Condition Looking East**



**Viewpoint 2, Existing Condition Looking West**



**Viewpoint 3, Existing Condition Looking East**



**Viewpoints 1, 2, and 3**

Figure

**2.1-7**

**Table 2.1-29 Visual Quality Change from Visual Assessment Unit 2**

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

Source: Caltrans, 2014r

*Visual Assessment Unit 3*

Viewpoint 3, looking east from the center southbound I-80 lane between Air Base Parkway and Manuel Campos Parkway, represents the typical visual character of Visual Assessment Unit 3 as shown in **Figure 2.1-7**. Under the Build Alternative, primary improvements within Visual Assessment Unit 3 would be of similar type and appearance to features of the existing I-80 corridor resulting in a moderate-low resource change that would not substantially alter the existing moderate visual character and quality. New express lane signs would disrupt views of the landscape and rolling hills and vegetation which contribute to a reduction in the overall visual quality from moderate to moderate-low in Visual Assessment Unit 3. Viewer response from highway neighbors would be moderate-high as some have direct views, particularly from second stories of buildings and bicycle and pedestrian paths. Viewer response from highway users would be moderate-high as regionally valued and intermittent hillside views would be maintained.

Roadway widening would require tree and shrub removal on both shoulders of I-80, as well as 100 percent (approximately 2 miles) of existing median oleander plantings. Removal of this vegetation would eliminate the elements of the existing lushly landscaped corridor that softens the visual intrusion of the I-80 infrastructure (i.e., roadway, median barrier, and signs) and cause visual exposure of travelers in the opposite direction. Existing roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy. Median vegetation will be replaced as roadside landscaping. Due to the narrow width of highway right-of-way, it may not be possible to replace all vegetation. The moderate-high viewer response, coupled with the moderate-low resource change results in the Build Alternative having a moderate visual impact for Visual Assessment Unit 3.

The visual quality/resource change for Visual Assessment Unit 3 is summarized in **Table 2.1-30**.

**Table 2.1-30 Visual Quality Change from Visual Assessment Unit 3**

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

Source: Caltrans, 2014r

*Visual Assessment Unit 4*

Visual Assessment Unit 4 is located in the East Segment of the Build Alternative. Viewpoint 4, looking east from the center travel lane of eastbound I-80 between Lagoon Valley Road and Peña Adobe Road was one of the three viewpoints selected to represent the general character of visual resources study area. Within this unit, I-80 currently includes eight traveling lanes with shoulders on each side. The visual simulation depicted in **Figure 2.1-8** illustrates how the addition of travel lanes in this area would not substantially change the look and character of I-80.

Under the Build Alternative, improvements include widening within the existing depressed median and outside of the existing edge of pavement to accommodate new express lanes. These primary improvements within Visual Assessment Unit 4 would be of similar type and appearance to features of the existing I-80 corridor. However, the median oleander removal described below would result in a moderate-high resource change that would alter the existing moderate visual character and quality by decreasing vividness from moderate-high to moderate-low.

Roadway widening would require tree and shrub removal on both shoulders of I-80, as well as 100 percent (approximately 2 miles) of existing median oleander plantings. Removal of this vegetation would eliminate the elements of the existing lushly landscaped corridor that softens the visual intrusion of the I-80 infrastructure (i.e., roadway, median barrier, and signs) and cause visual exposure of travelers in the opposite direction. Existing roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy. Median vegetation will be replaced as roadside landscaping. Due to the narrow width of highway right-of-way, it may not be possible to replace all vegetation. Replacing landscaping and roadside vegetation per Caltrans policy would reduce the potential for visual impacts as a result of vegetation removal in Visual Assessment Unit 4.

#### Viewpoint 4, Existing Condition Looking East



#### Visual Simulation of Viewpoint 4



Visual Simulation of Viewpoint 4

Figure

2.1-8



Twelve new express lane signs, including the replacement/relocation of four existing post-mounted exit signs, would be prominent, visible features in the relatively rural setting of this unit. Additional lighting infrastructure would introduce substantial new sources of light and would be more noticeable in this area, due to the rural nature of the unit. However, lighting would be incorporated in conformance with Caltrans design standards, which minimize night-time glare and sky glow to the extent feasible. Freeway lighting would be directed downward to the roadway surfaces, away from adjacent land uses or the sky. The sign elements of the Build Alternative would be designed per Caltrans *California Manual on Uniform Traffic Control Devices*.<sup>35</sup> 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 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.

Roadway widening and vegetation removal are not likely to cause I-80 to be visible from the Peña Adobe Park. However, removal of trees between I-80 and Rivera Road and the complete removal of the oleander in the median would cause eastbound I-80 to be more visible from the Ranchotel Motel and would open up views of westbound I-80. The highway neighbor viewer response would therefore be moderate-low in Visual Assessment Unit 4. Under the Build Alternative, tourist and highway users traveling during congested traffic conditions and slower speeds would continue to experience views of a rural hilly natural landscape that is visually appealing to travelers. These highway users would notice wider views of the surrounding hills and horizon with removal of vegetation in the median and shoulders and would notice the additional express lane signs as the dominant features along the freeway that would disrupt the continuous line of the terrain. Median oleander removal and freeway widening would also be noticeable, but would not change the visually pleasing landscape of the surrounding hills.

Roadway widening and vegetation removal would reduce the vividness of the unit from high to moderate-low, and the intactness and unity from high to a moderate level. The visual quality for Visual Assessment Unit 4 is summarized in **Table 2.1-31**. The high viewer response, coupled with the moderate-high resource changes results in the Build Alternative having a high visual impact for Visual Assessment Unit 4.

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<sup>35</sup> Caltrans, 2012. *California Manual on Uniform Traffic Control Devices*. Available online at: [http://www.dot.ca.gov/hq/traffops/engineering/mutcd/ca\\_mutcd2012.htm](http://www.dot.ca.gov/hq/traffops/engineering/mutcd/ca_mutcd2012.htm); last accessed: June 3, 2014.



**Table 2.1-31 Visual Quality Change from Visual Assessment Unit 4**

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

Source: Caltrans, 2014r

*Visual Assessment Unit 5*

Visual Assessment Unit 5 is located in the East Segment of the Build Alternative. Under the Build Alternative, improvements within Visual Assessment Unit 5 would include widening within the existing depressed median and outside of the existing edge of pavement to accommodate new express lanes. The Build Alternative would construct 34 overhead signs in this unit, including the replacement/relocation of nine existing signs and bridge structure modifications. Trees would be removed along the westbound I-80 shoulder, as well as 2.7 miles (100 percent) of oleander plantings within the median.

Viewpoint 5 is looking east from the center lane of east bound I-80 lane from Mason Street and Allison Drive. Viewpoint 6 is looking from eastbound I-80 from the center lane between Allison Drive and Nut Tree Road and includes the Nut Tree Road overcrossing. Viewpoints 5 and 6 were two of the three viewpoints selected to represent the general character of visual resources study area. Two visual simulations were prepared within this unit as depicted in **Figure 2.1-9** and **Figure 2.1-10**, which illustrate how the addition of travel lanes in this area would not substantially change the look and character of I-80. The figure illustrates a potential soundwall to be constructed and illustrates the typical appearance of an overhead sign. Both visual simulations illustrate the increased exposure to neighboring land uses and opposing traffic that would be created by tree removal along the shoulder and complete oleander removal in the median.

The visual character and quality of the Build Alternative would be generally compatible with the existing visual character and quality of Visual Assessment Unit 5, as the proposed improvements would be of similar type and appearance to features of the existing freeway corridor. However, the median oleander removal described below would result in a high viewer response. The added overhead signs would also impact the intactness of the area. Highway neighbors would have high sensitivity and a high viewer response to the proposed Build Alternative in Visual Assessment Unit 5 due to median oleander removal. The addition of express lane signs, toll reader equipment, and relocation of the existing exit sign would generally blend in with the views of existing signs and would not dominate over the tall trees to the south.

**Viewpoint 5, Existing Condition Looking East**



**Visual Simulation of Viewpoint 5**



**Visual Simulation of Viewpoint 5**

Figure

**2.1-9**

### Viewpoint 6, Existing Condition Looking East



### Visual Simulation of Viewpoint 6



Visual Simulation of Viewpoint 6

Figure

**2.1-10**

Removal of all vegetation in the median and some trees along the shoulders would eliminate the elements of the existing lushly landscaped corridor that soften the visual intrusion of the I-80 infrastructure. Removal of oleanders in the median would also cause greater visual exposure of travelers in the opposite direction. In addition, the oleanders planted in the median within Visual Assessment Unit 5 are considered to be a valuable aesthetic and safety resource by the City of Vacaville per the City Gateways Plan. With increased views of both commercial and industrial developments and distant mountain ranges, the overall vividness and unity of the viewpoint would be reduced to moderate-low. Tree and vegetation removal would disrupt the existing line of foliage causing intactness to decrease to a low rating. Existing roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy. Median vegetation will be replaced as roadside landscaping. Due to the narrow width of highway right-of-way, it may not be possible to replace all vegetation. Replacing landscaping and roadside vegetation per Caltrans policy would reduce the potential for visual impacts as a result of vegetation removal in Visual Assessment Unit 5. Overall, highway users would have a high response to changes within Visual Assessment Unit 5.

The high response coupled with a moderate-high resource change would result in a high visual impact for Visual Assessment Unit 5. The visual quality/resource change for Visual Assessment Unit 5 is summarized in **Table 2.1-32**.

### Summary of Visual Impacts

**Table 2.1-33** summarizes the visual impacts for the Build and No-Build Alternatives and compares the narrative ratings for visual resource change and viewer response for each Visual Assessment Unit.

**Table 2.1-32 Visual Quality Change from Visual Assessment Unit 5**

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

Source: Caltrans, 2014r

**Table 2.1-33 Summary of Visual Impacts**

Visual Unit	Build Alternative			No-Build Alternative		
	Resource Change	View Response	Visual Impact	Resource Change	Viewer Response	Visual Impact
West Segment				No Change		
1	Low	Moderate	Moderate-Low			
2	Low	Moderate-High	Moderate			
East Segment						
3	Moderate-Low	Moderate-High	Moderate			
4	Moderate-High	High	High			
5	Moderate- High	High	High			

Source: Caltrans, 2014r

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*. Proposed overhead express lane signs would have varying degrees of impact throughout the study area, depending on the existing scenery and backdrop. While the proposed signage would disrupt the unity of the landscape, the overall character and quality would remain relatively unchanged. None of the proposed signage would reflect light onto adjacent land uses. Additional lighting infrastructure would not substantially introduce new sources of light because there are existing street lights in the immediate area throughout most of the project study limits, consistent with major transportation corridors. Furthermore, commercial, industrial, and residential areas nearby also contribute to sources of light along the corridor. Existing lighting infrastructure is less prevalent within Visual Assessment Unit 4 and additional lighting infrastructure would increase the amount of visible light at nighttime for highway users. However, Visual Assessment Unit 4 contains little to no residential areas on adjacent sides of the corridor, and appropriate light and glare screening measures and use of downward cast lighting would avoid impacts.

No vegetation or tree removal is anticipated that would create gaps in vegetation greater than 200 linear feet when considering the vegetation on both sides of the freeway. The majority of the landscaped areas/ornamental plantings that would be removed as part of the Build Alternative are associated with 6.7 miles of median oleander removal within Visual Assessment Units 3, 4, and 5. Existing landscaping and other roadside vegetation removed by the Build Alternative, including the median oleander removal, will be replaced as roadside landscaping where proper setback exists and where feasible per Caltrans policy. Replacing landscaping and roadside vegetation per Caltrans policy would reduce the potential for visual impacts as a result of vegetation removal.

Overall, implementation of the Build Alternative would result in changes to the existing visual environment. The changes would be more evident in some areas of the study area than in others, particularly in East Segment where roadway widening and vegetation removal would be required to accommodate new express lanes. The West Segment would impact approximately 4,855 linear

feet of vegetation along the freeway shoulders. Overall, the magnitude of change would be notable, but would not substantially alter scenic vistas, scenic resources, or substantially degrade the existing character and quality of the study area. The Build Alternative would not create a substantial, new source of light or glare with appropriate avoidance and minimization measures. The visual impact for the entire Build Alternative would be moderate. The visual impact for the West Segment would be moderate-low, while the visual impact for the East Segment would be high.

### **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 visual resources study area. 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 they would be minimized through use of standard construction equipment and protocol and appropriate light and glare screening measures. Temporary visual effects from the construction of the Build Alternative would be typical of any major corridor improvement project, and are not considered to be substantial.

#### **West Segment –Fundable First Phase**

Visual Assessment Units 1 and 2 of the visual resources study area are located within the West Segment of the Build Alternative. See to **Table 2.1-33** and the discussions above for a summary of the environmental consequences evaluated within the West Segment. Temporary construction impacts described under the Build Alternative would also apply to the West Segment.

### **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 Solano 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 mandates that a qualitative/aesthetic approach should be taken to reduce visual quality loss in the visual resources study area. Offsetting adverse impacts addressed in visual assessment unit analyses and summarized in the previous section would consist of adhering to the following design requirements in cooperation with the Caltrans District Landscape Architect:

**Measure VIS-1:** Existing landscaping and other roadside vegetation removed by the Build Alternative will be replaced where proper setback exists and where feasible per Caltrans policy. Replacement planting would be accomplished as a separate contract, funded from the parent roadway contract, and would include a three-year plant establishment period. Landscape plans shall be developed during the final design phases and be approved by Caltrans.

**Measure VIS-2:** Replacement landscaping within the designated Landscaped Freeway location between post miles 15.52 and 16.27 (between the Cordelia Truck Scales and Abernathy Road overcrossing) and post miles 17.03 and 19.71 (from just west of the West Texas Street undercrossing to the Air Base Parkway overcrossing) will be designed such that the criteria for the Landscaped Freeway will be maintained. In these areas, planting must be continuous (no gaps  $\geq$  200 feet), ornamental (not functional), at least 1,000 feet long, on at least one side of the freeway, and require reasonable maintenance.

**Measure VIS-3:** To reduce the visual impact of new retaining walls, aesthetic treatments consisting of color, texture and/or patterning will be applied to reduce visual impacts. The aesthetic treatment shall be context sensitive to the location and be compatible with existing walls in the project 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. Necessary earthwork shall include slope rounding and contour grading where feasible. Aesthetic treatments shall be developed during the final design phases and be approved by Caltrans.

**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 will be used at the Construction Staging Areas including the use of downward cast lighting.

### **West Segment –Fundable First Phase**

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

### **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 Solano 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.

## 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 listing in the National Register of Historic Places (National Register). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation [36 Code of Federal Regulations (CFR) 800]. On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, the Federal Highway Administration (FHWA), State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327). The First Amended Section 106 PA went into effect in 2014. The Historical Resources Evaluation Report (HRER) for this project, discussed further below, was completed in December 2013 under the previous Section 106 PA. The First Amended Section 106 PA (2014) does not change the findings made under the older Section 106 PA (2004).

Historical resources are considered under the California Environmental Quality Act (CEQA), as well as CA Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet the National Register of Historic Places listing criteria. It further specifically requires the Department to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register or are registered or eligible for registration as California Historical Landmarks.

### AFFECTED ENVIRONMENT

The analysis in this section is based on the Historic Property Survey Report (HPSR) prepared for this project (Caltrans, 2014f). The HPSR incorporates the results of the Archaeological Survey Report (ASR), the Historical Resources Evaluation Report (HRER), the Environmentally Sensitive Area (ESA) Action Plan, and Testing/Treatment Plan completed in October 2014. The study area for cultural resources is identified by the archaeological 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 archaeological and architectural APE is located within/along the existing Caltrans right-of-way along westbound and eastbound I-80; from Red Top Road in Cordelia to the I-505/I-80 intersection in the City of Vacaville. Several small areas of the APE extend beyond the existing right-of-way to include the areas that would be acquired as part of the project for utility conduits and construction staging. Two short sections of the APE at the easternmost project limits are discontinuous because they relate to required express lane entry signs one mile from the entrance and end of the proposed facility, with no construction work required between the signs and express lanes.

The APE covers 20 miles, encompassing approximately 920 acres. In addition to representing the full project footprint and the full horizontal extent of all potential project activities, the archaeological APE includes a vertical extent to encompass all project-related earthmoving construction activities. The vertical APE varies greatly within the project limits:

- Grading: range of 3-6 feet
- Conduit trenching and directional drilling: maximum of 5 feet
- Tolling equipment poles: 11 feet
- Sign posts: 45 feet
- Pile driving at bridge crossings: maximum of 50 feet

### **Archaeological Resources**

An analysis of potential sensitivities for buried sites, based on landform age and environmental characteristics, was conducted for all areas within the archaeological APE. The results of this analysis show that 48.9 percent of the APE is categorized as having Very Low to Low potential for buried sites, 10.6 percent has Moderate potential, and approximately 40.5 percent has a High or Very High potential for buried sites. The most likely locations for buried sites are those lands in the High or Very High category. To the maximum extent possible, 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 for the APE was conducted as part of the ASR. No surface archaeological material was observed within the APE during the field surveys. Four archaeological sites are known to occur within the APE. One of the known sites within the APE will not be affected by the project. The remaining three sites will be considered eligible for the National Register and protected from inadvertent project impacts with ESAs.

Because the Build Alternative would involve construction activities near the archaeological sites, an ESA plan was prepared to protect known resources. Due to access issues, a testing/treatment plan was established to test for potential cultural resources during project construction. Consultation

with the SHPO will be ongoing throughout the testing phase. If cultural resources are identified, protocol as stipulated in the testing/treatment plan will be followed.

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-era Built Environment**

A records search in both archival and published records, review of historic and current maps, and field surveys were conducted to determine the presence of historical architectural resources within the APE. Seven resources, not previously identified in the Solano I-80 corridor study, required formal evaluation. Of these seven resources, none met criteria for listing in the National Register or California Register of Historical Resources (CRHR). In July 2013, letters were sent to interested parties, planning agencies, local governments, historical societies, and museums associated with the historic-era properties. No responses were received from these letters. Of the forty bridges in the APE, thirty two bridges are 45 years or older, and none were determined eligible for the NRHP.

One historic era property was previously evaluated in the Solano I-80 corridor study. The Peña Adobe site (adobe built 1842, annex built 1880) is located approximately two miles southwest of Vacaville, on the east side of I-80 within the City of Vacaville's Lagoon Valley / Peña Adobe Regional Park. It is designated as California Historical Landmark (Historical Landmark No. 534) and was listed in the NRHP in 1972. The Peña Adobe was found significant for its association with Solano County pioneer Juan Felipe Peña and is the only listed historic property in the APE. An August 2013 field check found that neither the adobe nor the annex appear to have undergone alterations that would warrant a change in its current National Register listing.

## **ENVIRONMENTAL CONSEQUENCES**

### **Build Alternative**

Based on the investigations conducted, there are four known archaeological sites and one built historic property within the APE.

The Build Alternative would not require any land acquisitions that would directly affect the Peña Adobe buildings. While some trees within the Caltrans right-of-way along the westbound shoulder are proposed for removal, they are not within the historic Peña Adobe site. The majority of trees between the Peña Adobe buildings and the freeway will not be affected by the Build Alternative, and will continue serving as existing visual screening for the site. The Build Alternative would not result in the use (direct or indirect) of a historic property qualifying for protection under Section 4(f) (see **Appendix B**).

As construction activities could potentially unearth previously identified and unidentified resources, provisions to address these circumstances are included in the Avoidance, Minimization, and/or Mitigation Measures section below. ESA and Testing/Treatment plans were established to protect known cultural resources within the APE. Consultation with the SHPO will be ongoing throughout the testing phase. If cultural resources are identified, protocol as stipulated in the testing/treatment plan will be followed.

#### *Native American Consultation*

Sacred Lands File searches by the NAHC conducted in January 2012 and April 2013 determined that no recorded resources are known within or near the project APE. At that time, letters were sent to interested Native American groups. In May 2013 additional consultation of the current project was sent to these same parties.

One response was received from Mr. James Sarmento, Cultural Resources Manager, Yocha Dehe Wintun Nation. Mr. Sarmento indicated in his response letter that the project is within the aboriginal territories of the Yocha Dehe Wintun Nation and that the tribe has concerns that the project may have the potential to impact undiscovered cultural concerns. A site visit with the tribe was requested to be scheduled prior to construction activities.

#### **West Segment –Fundable First Phase**

One buried archaeological resource is located within the West Segment of the Build Alternative, and considered eligible for the National Register. However, there is no proposed work at this location and ground disturbance in the general area is not expected to exceed 5 feet, well above the 13-foot depth of the buried site. There are four areas identified as Very High sensitivity locations. All known cultural resources will be avoided in these four sensitive areas. The West Segment would implement the same avoidance and minimization measures as in the Build Alternative.

#### **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 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-2:** 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 Native

American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact District 4 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

**Measure CUL-3:** Per the ESA Action Plan, unintentional adverse effects on archaeological resources will be avoided by establishing ESAs around the known archaeological site boundaries within the APE. A summary of the ESA Action Plan tasks are outlined below. Caltrans shall inform interested Native Americans about the proposed project activities and the ESA Action Plan prior to construction.

- The Caltrans Archaeologist will review the final design package to ensure that the ESAs 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, as specified in the design package. The Caltrans Archaeologist will supervise and monitor ESA fence installation.
- Prior to construction workers shall be informed of the ESAs and expectations. The ESAs will be discussed during a pre-construction meeting. The importance of the ESAs will be discussed with construction personnel and it will be stressed that no construction activity (including storing or staging of equipment or materials) should occur within an ESA and that workers must remain outside of the ESAs at all times. Construction personnel will be informed of historic preservation laws that protect archaeological sites against any disturbance or removal of artifacts. The ESA boundaries, expected activities, and equipment should be defined. Workers should be educated about what cultural materials might be encountered, to stop work if any are encountered, and how to communicate with the Caltrans Archaeologist.
- The Caltrans Archaeologist will be notified when construction begins and will inspect the construction area on a periodic basis to ensure that the ESAs are not breached.
- The Resident Engineer will inform the Caltrans Archaeologist when construction is finished. The Contractor, under supervision of the Caltrans Archaeologist, will remove temporary ESA fencing at the conclusion of construction.

**Measure CUL-4:** Unintentional adverse effects on archaeological resource sites for which the physical boundaries have not been fully determined would be avoided by implementing the Testing/Treatment Plan prepared for the project that would include four steps:

1. *Resource identification (i.e., presence/absence);* Prior to construction but after safe access to the freeway median is obtained, qualified archaeologists will examine subsurface deposits using a backhoe or coring device at the three site locations, focusing on the designated areas where construction activities would approach 5 feet below ground surface (i.e., conduit

trenching). If archaeological deposits are identified, additional exploration will determine their general nature and extent in the next phase.

2. *Test excavations for integrity and assemblage identification*; hand excavation units will be used to determine the content and character of cultural deposits identified during backhoe/coring work.
3. *Data recovery*; if resources are discovered, qualified archaeologists will obtain sufficient data to fully characterize function and systemic context from an intact deposit. Data recovery operations will be concentrated in areas where data potential is considered greatest (i.e., best preserved, highest artifact density, features, cultural stratigraphy).
4. *Report Preparation*; If Testing/Treatment Plan finds no intact cultural deposits, it will be documented in a report that will include appropriate maps, photo documentation, detailed trench and hand excavation data, and any site-record updates. If positive findings are made, the results will be documented in a draft technical report. Reports will be consistent with guidance provided in Caltrans Standard Environmental Reference.

Each phase is dependent upon findings from the prior phase, and will be continuous. Native American monitors will be present during all phases of excavation or ground disturbance to address their concerns; they will be required to maintain a daily monitoring log.

#### **West Segment–Fundable First Phase**

**Measures CUL-1** and **CUL-2** described above for the Build Alternative will apply in the West Segment. There is one known archaeological site within the West Segment; however, no subsurface construction activities are proposed in the area of this site. Therefore, the measures in the ESA Action Plan (**Measure CUL-3**) would not apply. Because the Build Alternative is not anticipated to affect this one site within the West Segment, it is not included in the Testing/Treatment Plan established for the remaining known sites within the project limits (East Segment). **Measure CUL-4** would therefore not apply to the construction of the West Segment.

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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 requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

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

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

#### AFFECTED ENVIRONMENT

Hydrology and Floodplains (hydrologic) information for this section is provided in the Location Hydraulic Study prepared for the project (Caltrans, 2014j). The Location Hydraulic Study Report incorporates information from the Federal Emergency Management Agency (FEMA), Flood Insurance Rate Maps (FIRM) for Solano County. The Location Hydraulic Study also incorporates information from United States Geological Survey (USGS) topographic maps, aerial photographs, and a site visit conducted in April 2013.

The hydrologic study area includes 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 the I-80 corridor, within the project limits.

The West Segment portion of the Build Alternative, from west of Red Top Road to Air Base Parkway, would convert approximately eight miles of existing HOV lanes into express lanes. Work would comprise mostly of foundation installation for poles and gantries where new signs would be installed and foundation pad and trenching for electrical conduits. Since the work for the

West Segment does not constitute any encroachment on existing floodplains and waterways, no flood risks or adverse effects to the hydrology of the area would occur. As such, this analysis focuses on the Build Alternative's potential affects to the hydrology of the East Segment. The conditions of the West Segment are not discussed further.

### 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<sup>1</sup> 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. Zone X (shaded) is not considered a Special Flood Hazard Area; however areas of one percent annual chance flood with a depth less than 1 foot are still areas of one percent annual chance flood or base flood areas.

**Table 2.2-1** presents information on the ten floodplains within the hydrologic study area of the East Segment, each of which is associated with a waterway crossing. The majority of the I-80 corridor is at a higher elevation than the surrounding floodplains, and as such, is not considered to be within a Special Flood Hazard Area, and/or is not inundated during 100-year flood events. The FIRM identifying the floodplain of Horse Creek and Middle Branch Horse Creek at I-80 shows the flow from the floodplain overtopping I-80 during a 100-year flood event; however, the flood profiles show the base flood elevation as being below the I-80 roadway elevation. **Figures 2.2-1a** through **2.2-1c** include the maps identifying the FEMA floodplains for the East Segment, with Zones AE and A representing the 100-year floodplain.

<sup>1</sup> Base flood is the regulatory standard for a flood having a one percent change of being equaled or exceeded in a given year. The base flood elevation is the computed elevation to which floodwater is anticipated to rise during the base flood. The base flood elevation is the regulatory requirement for the elevation or floodproofing of structures.



**Table 2.2-1 Floodplain Information (East Segment)**

Approximate Post Mile Location	Flood Source	FIRM Panel(s)	Flood Zone	Inundates Freeway
20.30	Union Avenue Creek	06095C0266E; 06095C0267E	AE, X, X <sup>1</sup>	No
21.66	Soda Springs Creek	06095C0266E	X <sup>1</sup>	No
22.14	Laurel Creek	06095C0266E	A, X	No
24.26	Lagoon Drain	06095C0259E	AE, A, X	No
24.45	Laguna Creek	06095C0259E	AE, X, X <sup>1</sup>	No
25.03	Alamo Creek	06095C0259E; 06095C0257E	AE, A, X, X <sup>1</sup>	No
26.61	Ulati Creek	06095C0276E	AE, X, X <sup>1</sup>	No
28.32	Pine Tree Creek	06095C0277E	X	No
28.57	Horse Creek	06095C0164E	X	No
29.25	Horse Creek/Middle Branch Horse Creek	06095C0164E	AE, A, X <sup>1</sup>	No

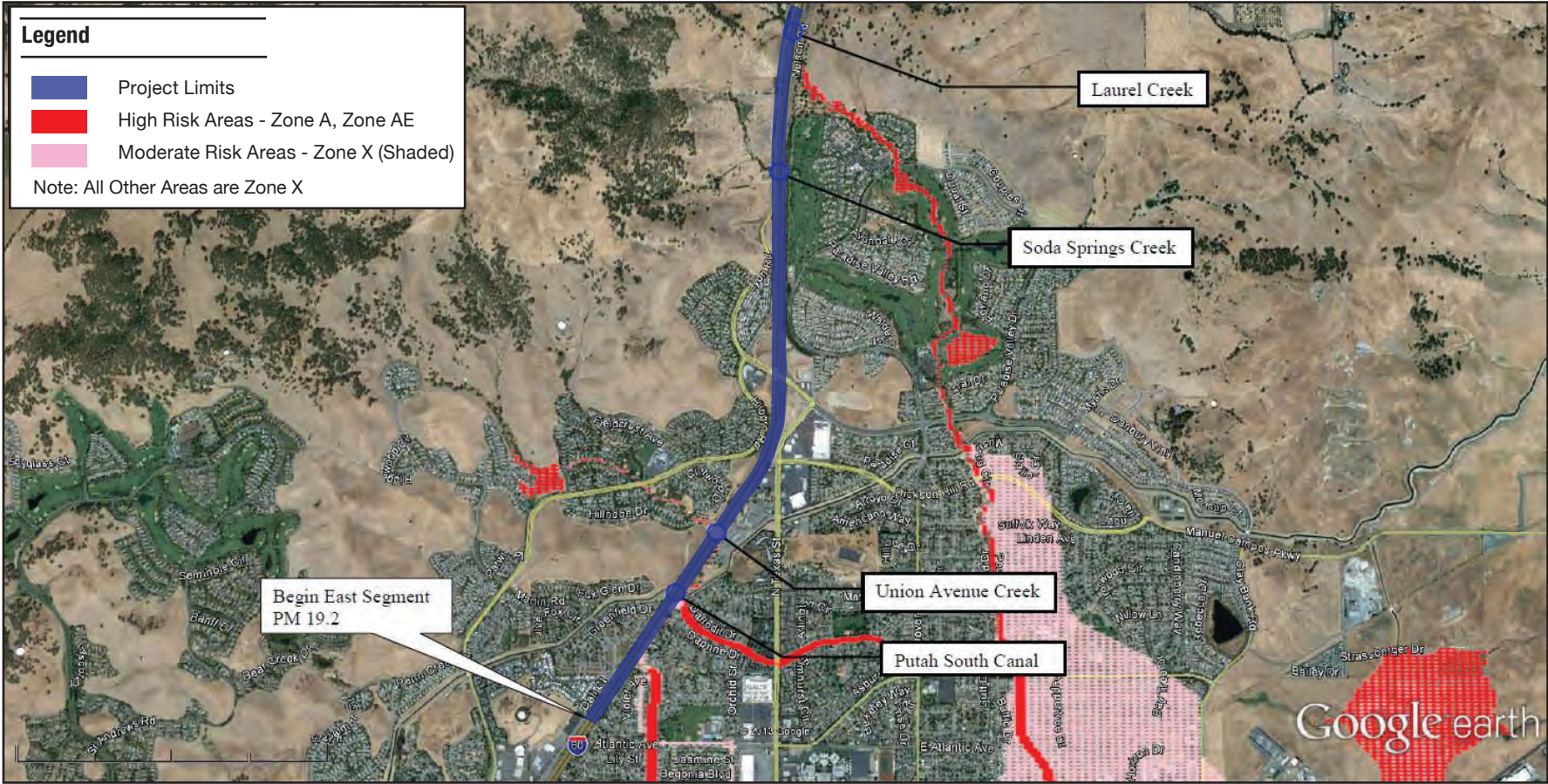
Note: SFHA = Significant Flood Hazard Area

X<sup>1</sup> = Zone X (shaded)

Source: Caltrans, 2014j

### 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**. See **Section 2.2.2, Water Quality and Storm Water Runoff**, where **Table 2.2-5** summarizes the beneficial uses for these water bodies.



NOT TO SCALE



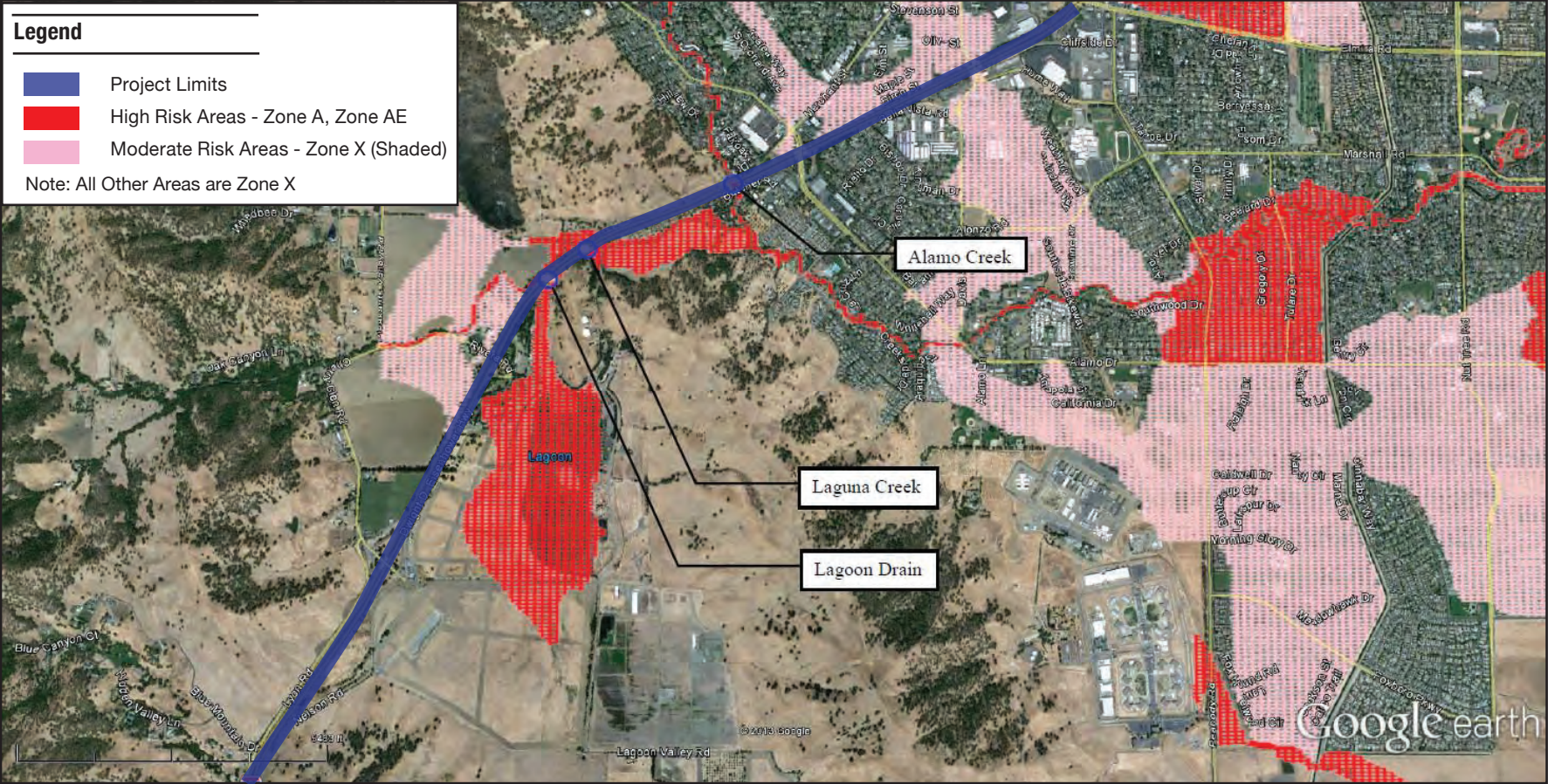
Floodplain Map - East Segment

Figure

2.2-1a

Source: Caltrans, 2014j





NOT TO SCALE



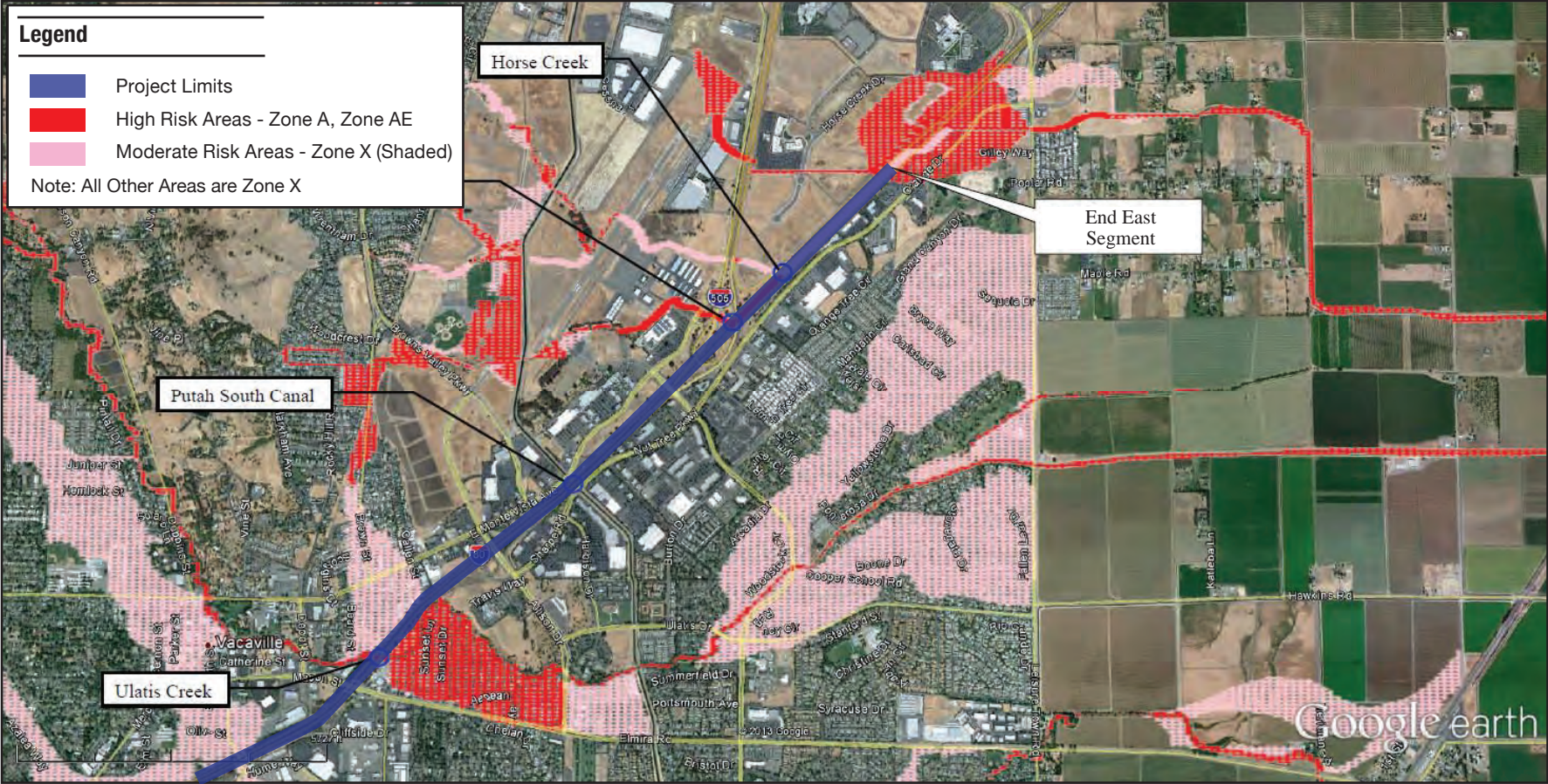
Floodplain Map - East Segment

Figure

2.2-1b

Source: Caltrans, 2014j





NOT TO SCALE



Floodplain Map - East Segment

Source: Caltrans, 2014j

## **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 Solano County, the project limits are not located in a tsunami inundation area.<sup>2</sup>

## **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**

As previously discussed, freeway lane conversion associated with the West Segment of the Build Alternative does not constitute any encroachment on existing floodplains and waterways, no flood risks or adverse effects to the hydrology of the area would occur. As such, this analysis focuses on the Build Alternative’s potential effects to the hydrology of the East Segment.

#### *Floodplain Encroachment 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 floodplains within the hydrologic study area in the East Segment run perpendicular to the I-80 corridor.

##### Risk of Action

The potential flood risks associated with implementation of the Build Alternative includes: 1) change in land use, 2) fill inside the floodplain, or 3) change in the 100-year water surface elevation. **Table 2.2-2** below presents the risk to the floodplains within the East Segment under the Build Alternative.

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<sup>2</sup> California Department of Conservation, 2013. Solano County Tsunami Inundation Map. Available at: [http://www.conservation.ca.gov/cgs/geologic\\_hazards/Tsunami/Inundation\\_Maps/Solano/Pages/Solano.aspx](http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/Solano/Pages/Solano.aspx); Last Accessed: January 23, 2014.

No 100-year floodplains exist at the Putah South Canal, Soda Springs Creek, Pine Tree Creek, and Horse Creek (westbound I-80) crossings. Therefore, there is no potential flood risk in constructing the East Segment of the Build Alternative at these waterway crossings.

The Build Alternative proposes widening of I-80, within the East Segment 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 0.04 percent). Additionally, the proposed widening would not significantly raise the grade of I-80, thereby avoiding potential risks associated with redirected flood flows.

**Table 2.2-2 Summary of Base Floodplain Effects**

Approximate Post Mile Location	Flood Source	Fill Required as part of Build Alternative	Estimated Volume of Fill (cubic yards)	Added Impervious Area	Percent (%) Added	Level of Risk
20.30	Union Avenue Creek	No	n/a	Yes	0.15%	Low
22.14	Laurel Creek	No	n/a	Yes	0.07%	Low
24.26	Lagoon Drain	No	n/a	Yes	0.17%	Low
24.45	Laguna Creek	No	n/a	Yes	0.02%	Low
25.03	Alamo Creek	No	n/a	Yes	0.03%	Low
26.61	Ulati Creek <sup>1</sup>	Yes	20	Yes	0.03%	Low
29.25	Horse Creek/Middle Branch Horse Creek	No	n/a	Yes	0.060%	Minimal

Note: 1) Ulati Creek widening will require widened bridge piers, which would raise the water surface elevation upstream of I-80; this does not however increase the level of risk.

Source: Caltrans, 2014j

The Build Alternative would widen I-80 at several locations within the hydrologic study area floodplains of several creek crossings. With the exception of the Ulati Creek bridge, the widening would be accommodated on top of the existing culvert crossings under I-80 and no modification to the culverts/creeks would be necessary. In these locations, no fill would be constructed within the floodplains.

To achieve the widening at Ulati Creek, new bridge piers will be placed within the creek, which will result in an estimated 20 cubic yards of fill within the creek's floodplain. The estimated fill is insignificant compared to the overall storage volume of the floodplain (0.2 percent). The added fill associated with the creek work would be offset by removing material from other area within this

floodplain. Potential locations for fill removal include, but are not limited to, the channel banks upstream and downstream of this creek crossing. The locations for the fill removal would be determined in the final design phase for the project.

The piers being added to achieve the inside widening at Ulati Creek bridge will be aligned with the existing piers, but will be 20 to 24 inches wider. Modeling indicates that the wider piers would increase the water surface elevation upstream of I-80 by 7.2 inches. However, these base floodplain impacts appear to be contained within the existing channel and therefore would not increase risk.

Based on the above conditions, the potential flood risks as a result of the Build Alternative are low at all locations within the East Segment.

### 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 to the I-80 corridor, within the East Segment. 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 potential 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. 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-80 within the East Segment.

### 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 potential 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 potential adverse effects to water quality anticipated from the implementation of the proposed improvements. **Section 2.3.2, Wetlands and Other Waters**, addresses potential 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-80, the Build Alternative's effects to the floodplains would be minimal with regard 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.

#### **West Segment – Fundable First Phase**

As previously discussed, work associated with the West Segment portion of the Build Alternative does not constitute any encroachment on existing floodplains and waterways. No flood risks or adverse effects to the hydrology of the area would occur within the West Segment.

#### **No-Build Alternative**

The No-Build Alternative assumes that I-80 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 programmed improvements including ramp metering, traffic operating systems (TOS), and pavement rehabilitation. The No-Build Alternative would therefore not affect the hydrology or result in incomplete floodplain development.

### **AVOIDANCE, MINIMIZATION, AND /OR MITIGATION MEASURES**

#### **Build Alternative**

The potential flood risk as a result of the Build Alternative is 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. See 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.

**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.



### **West Segment – Fundable First Phase**

No avoidance, minimization, or mitigation measures specific to West Segment 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 <sup>3</sup> 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 always 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 United States. 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.

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<sup>3</sup> A point source is any discrete conveyance such as a pipe or a man-made ditch.

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 U.S. Environmental Protection Agency's 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 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. 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 <sup>4</sup> 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 in their jurisdictions 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

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<sup>4</sup> The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

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. RWCQB's 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 Best Management Practices (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 CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States 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 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, 2014s). The analysis focuses on potential adverse effects to the water quality of the hydrologic study area, as defined in **Section 2.2.1, Hydrology and Floodplain**.

### Regional Hydrology

The majority of the project limits are within the San Francisco Bay RWQCB jurisdiction, including the entire West Segment, and approximately two-thirds of the East Segment, from Air Base Parkway [post mile (PM 19.5)] to the Fairfield city limit (PM 22.5). From this point to the end of the East Segment, the project limits fall within the Central Valley RWQCB jurisdiction.

**Table 2.2-3** summarizes the RWQCBs regions and hydrologic planning areas. The project limits cross three hydrologic units, each with their own respective planning watersheds.

**Table 2.2-3 Hydrologic Planning Areas within the Project Limits**

I-80 Post Mile	Hydrologic Sub-area	Hydrologic Sub-area Number
West Segment PM R10.4/PM 19.5 East Segment PM 19.5/PM 22.0	Suisun Slough	207.23
East Segment PM 22.0/PM 25.0	Upper Elmira	560.10
East Segment PM 25.0/PM 30.2	Valley Putah-Cache	511.10

Source: Caltrans, 2014s

The regional hydrology generally follows the topography of the land, which gradually slopes to the south toward Suisun Bay. The area is composed of relatively flat grazing plains and rural open space with gently sloping hills adjacent to the I-80/I-680/SR12 interchange. The Vaca Mountains lie to the north of Suisun Valley and Fairfield.

Historically, agriculture has impacted runoff patterns in the areas adjacent to the I-80 corridor in West Segment of the project limits. Along the East Segment of the project limits, runoff patterns are affected by the urban development.

### Climate

The climate of Solano County is characterized by the two well-defined seasons of winter and summer. Winters are mild with frequent rain, and summers are warm to hot with infrequent precipitation. Normal annual precipitation ranges from approximately 17 to 31 inches within Solano County, particularly between November and April. The mean temperature varies from 45

degrees Fahrenheit in January to 70 degrees in July. In the valley floor areas (Vacaville-Dixon vicinity), the temperature may reach or exceed 100 degrees Fahrenheit for extended periods during the summer, and often falls below freezing during winter nights.

### Groundwater Hydrology

There are four groundwater basins within the Solano County as defined by the State Department of Water Resources: the Napa-Sonoma Lowlands subbasin within the Napa-Sonoma Valley basin, the Suisun-Fairfield Valley basin, and the Solano and Yolo Valley subbasins within the Sacramento Valley Basin (see **Table 2.2-4**).

**Table 2.2-4 Groundwater Basins within the Project Limits**

Groundwater Basin Name	Groundwater Sub-Basin	Basin Number	Size (acres)
Napa-Sonoma Valley Lowlands	Napa-Sonoma Lowlands	2-2.03	40,455
Suisun-Fairfield Valley	n/a	2-3	133,600
Sacramento Valley	Solano	5-51.66	425,000
Sacramento Valley	Yolo	5-21.67	256,000

Source: Caltrans, 2014p

The largest groundwater basin underlies the northeastern part of Solano County. This groundwater basin starts from the foothills above Vacaville and goes to the Sacramento River. The groundwater basin goes from the north boundary with Putah Creek to the south boundary of Fairfield. There are two basic levels to the groundwater basin. The shallower aquifer provides agricultural water and local domestic supplies. The shallower aquifer is underlain by the Tehama Formation aquifer. This aquifer is quite deep (over 1,000 feet) under Vacaville, but surfaces in the English Hills area north and west of Vacaville.

The depth of ground water within the project limits ranges from 3.3 feet to 20 feet. The groundwater is anticipated to vary with the passage of time due to seasonal groundwater fluctuation, surface and subsurface flows, ground surface run-off, and the change in the water level in the nearby creeks.

### Local Hydrology

**Table 2.2-5** identifies the creek and canal crossings within the project limits. The Putah South Canal starts at Putah Diversion Dam and runs easterly from the dam, eventually turning southward to follow the edge of the foothills, until its terminus near Cordelia. Union Avenue Creek, Springs Creek, and Laurel Creek originate from the Vaca Mountains, generally flowing in a southerly direction before being conveyed under I-80. After crossing I-80, these creeks continue southerly, ultimately discharging to the Suisun Slough. Lagoon Drain, Alamo Creek, and Ulatis Creek also originate from the Vaca Mountains, but generally flow in a southeasterly direction before being conveyed under I-80. After crossing I-80, these creeks continue easterly, ultimately discharging to

Cache Slough. Pine Tree and Horse Creek originate from the English Hills, and generally flow in an easterly direction before being conveyed under I-80. After crossing I-80, these creeks continue southeast and join Ulatis Creek.

### 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 RWQCB Basin Plan lists beneficial uses for creeks and stream crossings within the project limits. **Table 2.2-5** 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.

**Table 2.2-5 Waterway Crossings within the Project Limits**

Stream Name	Beneficial Uses
<b>West Segment</b>	
Jameson Canyon Creek	None listed
Green Valley Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Dan Wilson Creek	COLD, WARM, WILD, REC-1, REC-2
Suisun Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Raines Drain	None listed
Alonzo Drain	None listed
Ledgewood Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
Pennsylvania Avenue Creek	None listed
<b>East Segment</b>	
Union Avenue Creek	None listed
Soda Springs Creek	None listed
Laurel Creek	FRSH, COLD, MIGR, SPWN, WARM, WILD, REC-1, REC-2
Lagoon Drain	None listed
Laguna Creek	None listed
Alamo Creek	None listed
Ulatis Creek	None listed
Putah South Canal	None listed

Stream Name	Beneficial Uses
Pine Tree Creek	None listed
Horse Creek	None listed

Notes:

Existing beneficial uses:      FRSH—Freshwater Replenishment      REC-1—Water Contact Recreation  
    COLD—Cold Freshwater Habitat      REC-2—Non-contact Water Recreation  
    MIGR—Fish Migration      WARM—Warm Freshwater Habitat  
    SPWN—Fish Spawning      WILD—Wildlife Habitat

Source: Caltrans, 2014s

Clean Water Act 303(d) lists several of the waterways and receiving bodies within the project limits and are included on the California Water Act (CWA) 303(d) List of Water Quality Limited Segments. Such segments do not meet state water quality standards and are subject to TMDL requirements. **Table 2.2-6** lists the waterways are on the 303(d) list and the TMDL requirements.

**Table 2.2-6    Clean Water Act 303(d) List**

Waterway/ Receiving Water	Impairment/Source	TMDL
<b>West Segment</b>		
Suisun Creek	low dissolved oxygen from habitat modification, streambank modification/destabilization, and removal of riparian vegetation	Scheduled 2021
Ledgewood Creek	Diazinon from agricultural runoff	Scheduled 2021
Suisun Bay	chlordane, dichlorodiphenyltrichloroethane (DDT), and dieldrin from non-point sources	Scheduled 2013 <sup>A</sup>
	Dioxin compound and furan compound potentially contributed from atmospheric depression	Scheduled 2019
	mercury pollutant from atmospheric depression, industrial point sources, natural source, nonpoint source, and resource extraction	Scheduled 2008 <sup>A</sup>
	PCB pollutants from unknown point source	Scheduled 2010 <sup>A</sup>
<b>East Segment</b>		
Ulatitis Creek	chlorpyrifos and diazinon from agricultural runoff	Scheduled 2021

Note:

- A. No updates have been provided for the scheduled TMDL requirements from past years. However, an updated 303(d) listing process and TMDL requirements are anticipated as part of the 2016 Integrated Report (CWA Section 303(d) List / 305(b) Report), which will consist of data for the San Francisco Bay region.

Source: Caltrans, 2014p



## ENVIRONMENTAL CONSEQUENCES

### Build Alternative

#### *Effect to Receiving Waters*

##### Temporary Construction Related Effects

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 potentially increase 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 existing drainage structures. Temporary drainage facilities may be required during construction to redirect runoff from work areas.

##### Permanent Operation Related Effects

The Build Alternative would add approximately 28.1 acres of new impervious area, the bulk of which would be added in the East Segment (approximately 19.1 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 goal of the Build Alternative's drainage design would be to maintain existing drainage patterns. The disturbed soil area and existing added and reworked impervious area values for the Built Alternative are shown in **Table 2.2-7**.

**Table 2.2-7 Disturbed Soil and Impervious Area**

Project Segment	Disturbed Soil (acres)	Impervious Area (acres)			
		Existing	Added	Reworked	Removed
West Segment	4.1	244	0.30	0.9	-
East Segment	135.0	174	27.8	50.9	(2.4)
Total	139.1	418	28.1	51.8	(2.4)

Source: Caltrans, 2014p

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.

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 waterway crossings within the project limits, all of the waterways, with the exception of Soda Springs Creek, were determined to have a “low” susceptibility for hydromodification as a result of the impervious surfaces added with the construction of the Build Alternative. Soda Springs Creek was determined to have a “moderate” risk for hydromodification.

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-80 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 the U.S. Army Corps of Engineers and a 401 Water Quality Certification from the San Francisco Bay RWQCB will be required. 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 Services. 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 mitigated with re-vegetation, storm water treatment, or other requirements as designated by the relevant permits. See 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*

##### Temporary Construction Related Effects

The groundwater depth beneath the study area ranges from shallow and close to the surface to a depth of 20 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 in **Measure WQ-1: Temporary Construction Best Management Practices (BMPs)**.

#### Permanent Operations Related Effects

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 2.2-7**).

#### **West Segment –Fundable First Phase**

Construction of the West Segment would add 0.3 acres of new impervious surface. This is a very small amount (a 0.12 percent increase) in comparison to the existing impervious area of more than 200 acres. The added impervious area is not significant enough to change the drainage flow rate or impact to the groundwater. All storm water runoff will be properly conveyed through pipe, ditches, and bioretention swales.

Under the Build Alternative, the existing drainage patterns in the West Segment would not be altered. The existing flow rate is not expected to increase. There would be no effect to the groundwater and/or aquifer recharge. No dewatering is anticipated to be necessary during the construction of the West Segment.

#### **No-Build Alternative**

The No-Build Alternative assumes that I-80 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 programmed improvements including ramp metering, traffic operating systems (TOS), and pavement rehabilitation. The No-Build Alternative would therefore not affect the water quality conditions within the study area.

### **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 Storm Water Management Plan (SWMP) The features to address adverse effects to water quality 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 during the final design phase. Preliminary design of the storm water treatment areas for the Build Alternative is complete, as described in **Chapter 1.0**,

**Proposed Project.** 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**).

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 Best Management Practices (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 Sections 13 and 21 of the Caltrans’ Standard Specifications.

### **Measure WQ-1: Temporary Construction Best Management Practices (BMPs)**

Pursuant to the Construction General Permit, 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.

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 2.2-8** 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.

**Table 2.2-8 Temporary BMPs**

<b>Temporary BMP</b>	<b>Purpose</b>
<i>Soil Stabilization</i>	
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
<i>Sediment Control</i>	
Temporary Fiber Rolls	Degradable fibers rolled tightly 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 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 BMP	Purpose
Temporary Drainage Inlet Protection	Runoff detainment devices used at storm drain inlets that is subject to runoff from construction activities
Hydraulic Mulch (Bonded Fiber Matrix)	Consists of applying a water-based mixture of wood or paper fiber and stabilizing emulsion with hydro-mulching equipment. This will protect disturbed soil from erosion by raindrop impact or wind.
<i>Tracking Control</i>	
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.
<i>Non-Storm water Management</i>	
Temporary Creek Diversion	For work within live creeks. Prevents sediment and water from disrupting construction activities.
<b>All other anticipated non-storm water management measures are covered under Job Site Management.</b>	
<i>Waste Management and Materials Pollution Control</i>	
Temporary Concrete Washout Facilities	Specified vehicle washing areas to contain concrete waste materials.
<b>All other anticipated waste management and materials pollution control measures are covered under Job Site Management.</b>	
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 Miscellaneous job site management includes: training of employees and subcontractors proper selection, deployment and repair of construction site BMPs	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 – must be at least 50 feet away from water courses 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 wastes is collected and disposed of and not allowed into watercourses.

Source: Caltrans, 2014s

### *Permanent BMPs*

The design features to address water quality impacts are a condition of Caltrans' NPDES 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.

### **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 potentially 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 potentially 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 **Measure WQ-3**). 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.

All creek crossings along the project limits were determined to have a "low risk" for hydromodification, with the exception of Soda Springs Creek, which was determined to have a "moderate risk" for hydromodification. Measures to address hydromodification should be prioritized at Soda Springs Creek, and considered at all the low risk receiving waters. If hydromodification measures are difficult to implement, and the receiving water

bodies are “low risk,” then an exemption may be granted, at the discretion of the RWQCBs. A complete hydromodification susceptibility assessment and negotiation with the RWQCBs will be conducted during the final design phase.

### **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 BMP devices, the feasibility and determination of preferred treatment BMP type would be coordinated to ensure both Caltrans and regional requirements are met.

#### **West Segment – Fundable First Phase**

As previously discussed, under the Build Alternative, the existing drainage patterns in the West Segment would not be altered. The small amount of added impervious area (0.3 acre) is not significant enough to change the drainage flow rate or impact to the groundwater. There would be no effect to the groundwater and/or aquifer recharge within the West Segment. As such, the West Segment would be required to provide design pollution BMPs. Storm water will be treated to the maximum extent practicable. The project anticipates treating a total of 1.2 acres (0.3 acre of net added impervious surface and 0.9 acre of reworked area) of surface runoff with the proposed bioretention swale.

Because the West Segment would result in the disturbance of more than one acre of soil, it would have to comply with the NPDES construction General Permit. All temporary treatment BMP measures applicable to the Built Alternative would apply to the West Segment.

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. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative. Therefore, a Section 1602 Lake or Streambed Alteration Agreement with CDFW is not necessary for the West Segment.

## **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. The Department’s Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. Structures are designed using the Department’s 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 Department’s Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

## AFFECTED ENVIRONMENT

The evaluation of the geologic conditions within the project limits was conducted separately for the East and West Segments. Information presented in this section for the East Segment is based on a Preliminary Geologic Report (PGR) prepared for the project in 2014 (Caltrans, 2014o). The geologic conditions of the West Segment were evaluated in a 2006 PGR (Caltrans, 2006) and 2008 Geotechnical Design Report (Caltrans, 2008) previously prepared as part of the environmental review and final design of the I-80 HOV Lanes project. The 2006 and 2008 geotechnical evaluations cover the same limits along I-80 (Red Top Road to Airbase Parkway, PM R10.4 to PM 19.5) as the proposed West Segment of I-80 Express Lanes project, except for two overhead signs currently planned 1 mile and 0.5-mile west of where the express lanes would begin. Because the West Segment of I-80 Express Lanes project does not include any freeway pavement widening or bridge structure modifications, but rather primarily involves installation of tolling equipment and overhead signs, the subsurface conditions identified in the 2006 and 2008 geotechnical evaluations were used as the basis for the West Segment analysis. A technical memo was prepared to address the new geotechnical guidelines that were established after the 2006 and 2008 reports were approved, with minor additions and modifications to the information within the reports (Caltrans, 2013). Information presented in this section for the West Segment is based on the modified 2006 and 2008 geotechnical evaluations, along with supplemental information from the 2014 PGR prepared for the East Segment. Other resources used include geologic maps from California Geological Survey (CGS), soil surveys from the United States Department of Agriculture (USDA), and earthquake and hazards information from the Association of Bay Area Governments (ABAG).



The geologic study area represents the physical extent of all Build Alternative improvements, including construction activities and staging areas. The geologic study area includes various geologic features such as subsurface soils, topography, hydrogeology, geologic hazards, seismic hazards, and mineral resources that intersect and/or are adjacent to the I-80 corridor.

### Topography and Hydrogeology

The geologic study area is found near the western margin of the Great Valley Geomorphic Province and eastern margin of the Coast Range Geomorphic Province, characterized by gently rolling foothills on the eastern side of the Diablo Mountain Range. The elevation of areas east of I-505 and I-80 interchange is approximately 57 feet above mean sea level (msl). The elevation then rises to 209 feet above msl in the area between Rivera Road and Lincoln Highway.

Based on review of recent groundwater data located near the study area (Caltrans, 2014s), groundwater within the project limits is encountered between 10 feet and 45 feet below ground surface within the East Segment, and between 3 feet and 20 feet within the West Segment. Groundwater elevations vary due to the amount of precipitation in a year. Subsurface and surface water from the study area generally follows the local topography and flows into Alamo Creek, Ulatis Creek, Horse Creek, and their associated tributaries. These waterways eventually flow into Suisun Bay, located approximately 8 miles southeast of the study area. See to **Section 2.2.1, Hydrology and Floodplains**, and **Section 2.2.2, Water Quality and Storm water Runoff**, for detailed information about hydrology throughout the project limits.

### Geology and Subsurface Soils

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 the eight general categories summarized in **Table 2.2-9**.

**Table 2.2-9 Geologic Units Encountered Within Project Limits**

Geologic Time Scale	Type of Deposit
Holocene	Alluvial Fan Deposit. Alluvial fan deposits containing poorly sorted sand, gravel, silt, and clay. Deposits have been moved by streams coming from mountain drainages onto alluvial valleys. Found on fans, terraces, or basins.
Latest Pleistocene to Holocene	Alluvium. Conglomeration and various fragments of sand, silt, and clay deposits that form flat, consistent fans, terraces, and basins.
Late Pleistocene to Holocene	Alluvial fan deposits. Deposits contain sand, gravel, silt, and clay that is mapped on gently sloping, fan shaped semi-consistent alluvial surfaces.

Geologic Time Scale	Type of Deposit
Late Pleistocene	Fan Deposits. Moderately to poorly sorted and bedded gravel, sand, silt, and clay.
Eocene	Markley Sandstone. Massive, grayish-to yellowish-brown, medium to coarse-grained. Can easily break apart with water and is extremely susceptible to slope failure.
Late Cretaceous Age	Thick bedded, laminated fine to medium-grained sandstone with fairly thick beds of siltstone.
Late Cretaceous Age	Guinda Formation. Thick bedded, fine to medium grained sandstone with thick beds of siltstone.

Source: Caltrans, 2014o

The sediments within the Great Valley range from 5 to 10 kilometers in thickness and were mostly derived from erosion of the Sierra Nevada mountain range to the east. A portion of the Great Valley sediments originate from the Coast Ranges to the west. Narrow valleys and the large alluvial plain located north of the Delta and west of the Vaca Mountains are underlain primarily by unconsolidated Quaternary alluvium (sand, gravel, silt, and clay) and sedimentary rock.

Generally, the subsurface soils within the project limits consist of medium to hard clayey silt/silt clay. However, portions of the project limits contain occasional pockets of soft silt/clay and or loose clayey sand, underlain by dense to very dense sand or weathered shale/claystone/siltstone/sandstone. **Table 2.2-10**, summarizes subsurface soil conditions found close to various bridge structures throughout the project limits. Additionally, **Figures 2.2-2a-2.2-2c** depicts the existing underlying bedrock of the geologic study area.

**Table 2.2-10 Summary of Subsurface Soils**

Bridge Structure Name	Subsurface Soil Conditions (From As-built Boring Logs)
N. Texas Street OC	Stiff to hard lean Clay or loose clayey Sand, underlain by weathered Sandstone and weathered Shale.
Cherry Glen Road Overcrossing	Loose Sand, underlain by very stiff to hard Clay, underlain by weathered Shale.
Rivera Road Overcrossing (Old Pleasanton Valley Overcrossing)	Very soft clayey Silt/sandy lean Clay with intermittent layer of loose clayey Sand, underlain by medium stiff to stiff sandy.

Bridge Structure Name	Subsurface Soil Conditions (From As-built Boring Logs)
Alamo Creek Bridge	Very stiff sandy clayey Silt, underlain by medium stiff silty Clay and/or medium dense silty Sand, underlain by weathered Shale.
Davis Street Overhead	Medium stiff silty Clay, underlain by soft silty Clay/clayey Silt with occasional pocket/lens of loose silty Sand, underlain by dense sand, underlain by Claystone.
Mason Street Overhead	Medium stiff to hard silty Clay/sandy lean Clay with intermittent layers of soft sandy lean Clay/clayey Silt or medium dense Gravel, underlain by very dense Sand, underlain by weathered Siltstone/Sandstone/Claystone.
Ulati Creek Bridge	Very stiff to hard clayey Silt/silty Clay with intermittent layers of soft Silt/Clay and/or loose to medium dense silty Sand, underlain by dense to very dense Sand.
E-80-N505 Connector Separation	Stiff silty Clay, underlain by medium dense to very dense clayey Sand/silty Sand.
Horse Creek Bridge	Soft Silt and/or medium dense Sand, underlain by hard silty/sandy Clay and/or dense to very dense Sand.

Source: Caltrans, 2014o

# Legend\*

**Quaternary Deposits**

- Qs
- Q
- Qls
- Qlg
- Qoa
- Qpc

**Quaternary Volcanic Rocks**

- Qv
- Qvp
- Qv
- Qvp

**Tertiary Sedimentary Rocks**

- Tc
- P
- M
- Mc
- Ds
- Qs
- E
- Ec
- Ed

**Tertiary Volcanic Rocks**

- Tv
- Yp
- Y

**Tertiary Plutonic Rocks**

- gr

**Mesozoic Sedimentary and Metasedimentary Rocks**

- Tk
- K
- Ku
- H
- Ks
- Kst
- Kst
- J
- V
- soh
- ls

**Mesozoic Mixed Rocks**

- gr-m

**Mesozoic Metavolcanic Rocks**

- Mv
- mv

**Mesozoic Plutonic Rocks**

- gr
- lpm
- pl
- gr

**Paleozoic Sedimentary and Metasedimentary Rocks**

- Pv
- Pw
- C
- D
- SO
- C

**Paleozoic Mixed Rocks**

- gr

**Paleozoic Metavolcanic Rocks**

- Mv

**Paleozoic Plutonic Rocks**

- gr

**Pre-Cambrian Rocks**

- pb
- pc
- gr

**SYMBOLS**

Geologic boundary

Fault traces - solid where well located, dashed where approximately located or inferred, dotted where concealed, and queried where continuation or existence is uncertain. Ball and bar on downthrown side (relative or apparent). Arrows indicate direction of lateral movement (relative or apparent).

Thrust fault (barbs on upper plate)

Regional strike and dip of stratified rocks

Regional strike and dip of stratified rocks (overturned)

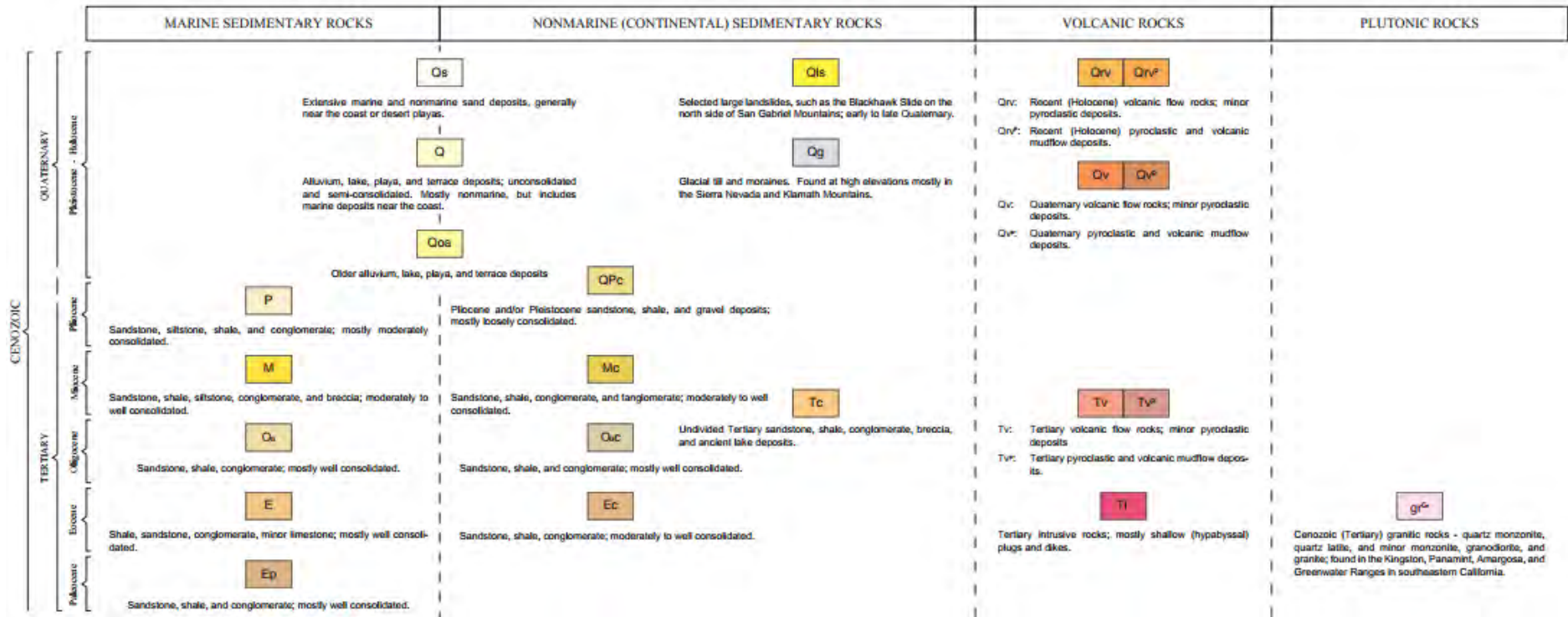
Anticlinal fold

Synclinal fold

Monoclinical fold



**Figure 2.2-2a**

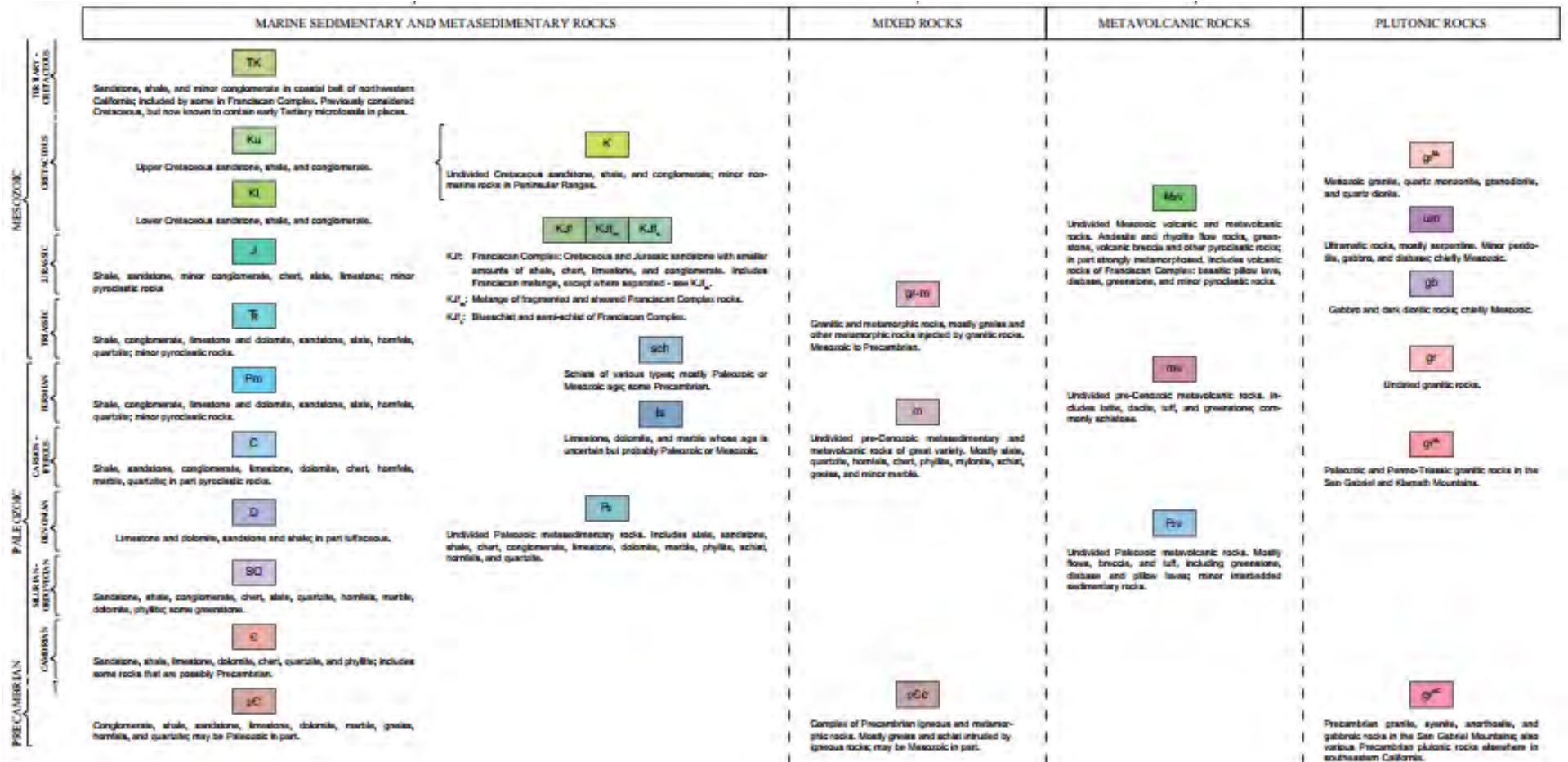


Bedrock Geology Legend

Figure 2.2-2b

Source: California Department of Conservation, 2014





Bedrock Geology Legend

Figure

2.2-2c

## Geologic Hazards

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

### *Soil Erosion*

Erosion is the breaking and movement of soil particles propelled by natural processes, such as wind, water, and ice. The rate in which soil erodes depends on the composition of soil, climate, and local landscape. Soil erosion can also be accelerated by human activities such as construction, vegetation removal, 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.

Generally, soils within the Build Alternative have a slight susceptibility to soil erosion. However, soils with a severe erosion hazard are located between at various locations between Air Force Base Parkway and Cherry Glen Road; and within 3,000 feet south of Alamo Creek Bridge.

### *Expansive Soils*

Expansive soils are characterized by the potential for shrinking and swelling as the moisture content decreases and increases. 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. The geologic study area contains underlying Tehama Formation (Pliocene) (Tpth), which is made up of sand, silt, clay, and volcanoclastic gravel. The clay is a highly expansive soil and can cause structural damage. Such expansive soils are located within the northeast portion of the East Segment, near the Ulatis Creek Bridge and I-505/I-80 interchange.

## Seismic Hazards

Primary seismic hazards include ground shaking and surface fault rupture. As a result, secondary hazards can occur in response to these primary hazards, such as liquefaction and landslides. The San Francisco Bay Area is considered one of the most active seismic regions in the United States.

The Vaca Valley Fault traverses the north portion of the project limits, extending along the eastern side of the Sacramento Valley and crossing beneath I-80 at the I-80/Alamo Drive interchange.

Unnamed faults, potentially related to the Vaca Fault, are apparent beneath I-80, approximately 1,500 feet northeast of the Rivera Road and 700 feet northeast of the Davis Street Overhead. The Vaca fault zone and the Great Valley 04b Gordon Valley are two known potentially active faults that intersect the eastern segment, trending in a northwest direction. Cordelia Fault and the Green Valley fault traverse the west segment near the I-680 and I-80 interchange. **Figure 2.2-3** depicts existing faults within the geologic study area and **Table 2.2-11** summarizes existing faults and their relative distance to the project limits.

**Table 2.2-11 Existing Faults and Distance to Project Limits**

Fault Name	Distance to Project Limits	Maximum Earthquake Potential
Great Valley 04b Gordon Valley Fault	Crosses East Segment near Allison Drive	6.7
Cordelia Fault	Crosses West Segment at I-680/I-80 interchange	6.5
Green Valley Fault	Crosses West Segment near Red Top Road	6.8
Vaca Fault Zone	Crosses East Segment at Alamo Drive	6.4
Great Valley 05 Pittsburg Fault	3 miles from East Segment at North Texas Street	6.6
Los Medanos-Roe Island Fault	8.5 miles from West Segment at Red Top Road	6.8

Source: Caltrans, 2014o

### *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 active fault trace. The California Geological Survey (CGS) delineates areas susceptible to surface fault rupture. Damages from surface fault rupture could indicate displacement of pavement, damage of underground utilities, and damage to bridge foundations.

The East Segment crosses several traces of active Vaca Fault Zones, while the West Segment crosses two active faults, the Cordelia Fault and Green Valley Fault (See **Table 2.2-11**). Therefore, the potential for surface rupture within these portions of the project limits is considered a moderate hazard.

### *Seismic Ground Shaking*

Seismic ground shaking generally refers to all aspects of motion of the earth's surface resulting from an earthquake, and is generally the major cause of damage during a seismic event. Seismic ground shaking could result in deformation of man-made structures such as the collapse of bridges, the rupturing of underground pipelines, cracking, and distortion of pavement, sidewalks, walls and foundations.





Fault Map

Figure 2.2-3

Source: Caltrans, 2014a

The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from epicenter and geological conditions. An epicenter is the point on the earth's surface above the focus point where the crust has ruptured. The magnitude of a seismic event is assessed by seismographs that measure the amplitude or seismic waves.

A maximum credible earthquake magnitude (Mmax) represents the largest earthquakes that could occur on any given fault. These predictions are based on the present understanding of the regional tectonic structure and available geological information. Refer to **Table 2.2-12** for the Mmax and **Figure 2.2-3** for the location of the listed faults in the vicinity of the geologic study area.

**Table 2.2-12 Maximum Credible Earthquake Magnitude for Faults in the Vicinity of the Study Area**

Caltrans Fault No.	Fault Name	Maximum Credible Earthquake Magnitude (Mmax)
104	Great Valley 04b Gordon Valley Fault	6.7
107	Cordelia Fault	6.5
108	Green Valley Fault	6.8
109	Vaca Fault Zone	6.4
111	Great Valley 05 Pittsburg Fault	6.6
120	Los Medanos – Roe Island Fault	6.8

Source Caltrans 2014o

Acceleration Response Spectrum (ARS) gives descriptive influence an earthquake would have on a specific buildings. According to the ARS, the earthquake potential within the project limits is considered high and therefore the project is subject to seismically-induced ground shaking. Peak Ground Acceleration (PGAs) obtains time differences of ground velocity and displacement of the ground. A high PGA equates to increased potential for damage. The Modified Mercalli Intensity scale (MMI) is the most commonly used scale to measure the subjective effects of earthquake intensity in values from I to XII. **Table 2.2-13** summarizes the MMI scale and PGA equivalents. The approximate MMI scale for bridge structures within the study area is VIII. The shaking in the West Segment is classified as having very strong to violent ground shaking, and the East Segment is classified as having strong ground shaking.

**Table 2.2-13 Description of MMI scale and PGA Equivalent**

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.
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.

Source: Caltrans, 2014o

### *Liquefaction*

Liquefaction is the temporary transformation of loose, saturated, granular sediments to a fluid like state as a result of seismic ground shaking. Soils temporarily undergo transient loss of strength, which commonly causes ground displacement such as lateral spreading. Cohesionless sands and silts that are relatively low density are more susceptible to liquefaction. Gravels and clays are more resilient to these types of seismic ground shaking hazards.

Liquefaction potential within the project limits is generally “low” to “moderate”; however, several portions of the project limits have “very high” liquefaction susceptibility. Liquefaction susceptibility in the following areas within the project limits would require additional investigation to determine the extent and magnitude of potential ground failure:

- northeast of Rivera Road to southwest of Laguna Creek
- Alamo Creek Bridge
- Mason Street Overhead
- Ulati Creek Bridge

### *Landslides*

Landslides can occur as rapid movement of large amounts of soil or unnoticeable 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, seismic activity, and removal of vegetation from slopes. Main factors that can contribute to landslides include the weather along with the composition of the underlying soil, bedrock, and slope. Expansive soils and weak bedrock are associated with slope failures (landslides) more so than any other factor.

Local topographic, geological, geotechnical, and subsurface groundwater conditions can pose a potential for permanent ground displacement. Within the project limits, areas with such landslide potential include:

- northeast of Greenfield Drive to northeast of Putah South Canal
- north of Manuel Campos Parkway to southwest of Blue Mountain Drive
- southwest of Lagoon Valley Road
- southwest of Alamo Creek
- southwest of Alamo Drive
- southwest of Alamo Drive to North of Alamo Creek

Historic landslides near the project limits appear to be localized and out of Caltrans right-of-way.

## Mineral Resources

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

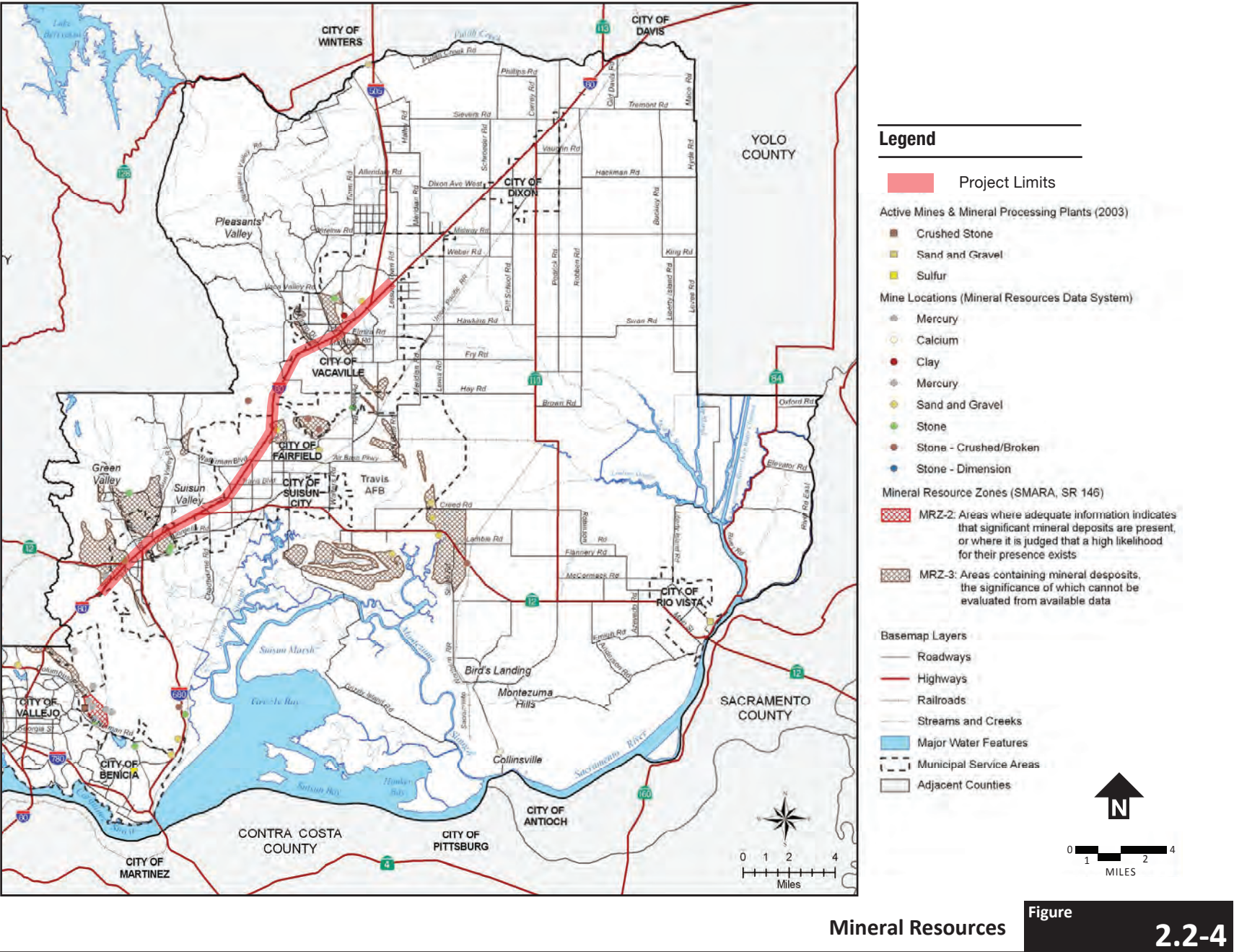
According to the Solano County General Plan, the county is rich with nonfuel mineral resources, including mercury, sand, clay, gravel, stone products, calcium, and sulfur. Pockets of such mineral resources are located within the I-80 corridor and are rated MRZ-3. There are three MRZs that cross the I-80 corridor, within the project limits. These three MRZs are located:

- crossing the I-80 between Hillborn Road and Dickson Hill Road within Fairfield's city limits
- intersecting the I-80 northeast of Vacaville approximately two miles southwest of the I-505 and I-80 intersection
- at the end of the West Segment project limit between Lincoln Highway and Cordelia Road and crossing the I-80

Solano County has a variety of stone, gravel, sand, mercury, and clay mines. According to the Mineral Resource Data System, three mines exist within 1 mile of the I-80 corridor. A sand and gravel mine are located east of the I-80 and west of Lincoln Highway in Fairfield. A clay mine is located northwest of I-80 and east of Brown Street in Vacaville. A sand and gravel mine is located west of the I-505 and northwest of the I-80. **Figure 2.2-4** depicts the intersections of MRZs, Active, and Processing plants within the I-80 corridor.

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





Source: Solano County, 2008

## ENVIRONMENTAL CONSEQUENCES

### **Build Alternative**

#### *Temporary Construction Related Effects*

Construction activities, such as grading and excavation, could significantly impact 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 potential 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 2.2-4**, there are three areas classified as MRZ-3 with known or suspected significant mineral deposits. These areas have either formerly or are currently being mined for clay, sand, and/or gravel. 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.

#### *West Segment -Fundable First Phase*

The risks associated with the local geology and seismic conditions described above for the Build Alternative are applicable to the West Segment. There are no conditions or risks specific to West Segment that would change the conclusions of the environmental consequences previously identified.

### **No-Build Alternative**

Under the No-Build Alternative, the freeway travel lanes along the I-80 corridor would remain as they currently exist. No bridge structures would be widened or replaced. Implementation of other planned and approved transportation 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.

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, sound walls, 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. Potential 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.

### **West Segment–Fundable First Phase**

Caltrans' standard design and construction guidelines are applicable to the entire Build Alternative alignment, including the West Segment. 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. The 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 Evaluation Report prepared for the project (Caltrans, 2014n). The geologic 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.

The geologic units encountered within the project limits include units from the Holocene, Pleistocene, Eocene, and Cretaceous periods. **Table 2.2-14** 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 2.2-5**.

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).<sup>5</sup>

<sup>5</sup> 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.

**Table 2.2-14 Paleontological Sensitivities of Geological Units within Project Limits**

Map Symbol	Age	Formation	Lithology	Project Segment Affected	Known Paleontological Resources	Paleontological Sensitivity
af	Holocene to Historic	Artificial Fill	Undifferentiated man-made deposits of various materials and ages	West	No significant resources	None
Qls	Pleistocene to Holocene	Quaternary landslide deposits	Chaotic, poorly-sorted deposits ranging in grain-size from clay to boulders	West	No significant resources	Low
Qha, Qhf, Qhff, Qhc, Qhl	Holocene	Holocene Alluvial Deposits	Poorly consolidated, younger alluvial deposits consisting of silt, sand, and gravel deposited in stream channels, basins, and on alluvial fans.	West, East	No significant resources	Low
Qa, Qf, Qpf	Late Pleistocene to early Holocene	Pleistocene Alluvial Deposits	Poorly consolidated older alluvial deposits consisting of silt, sand, and gravel deposited in basins and on alluvial fans. Mostly late Pleistocene in age but some units (Qa and Qf) include early Holocene sediments as well.	West, East	Vertebrates, including mammoth, ground sloth	High
Tpth	Plio-Pleistocene	Tehama Formation	Poorly consolidated siltstone, sandstone, tuff, and conglomerate	East	Vertebrates including horse, camel, sloth, tortoise	High
Tsv, Tsvt	Pliocene	Sonoma Volcanics	Rhyolite ash flows, andesite	West	Horse remains and plants	High

Map Symbol	Age	Formation	Lithology	Project Segment Affected	Known Paleontological Resources	Paleontological Sensitivity
			lavas, and volcaniclastic sedimentary deposits			
Tn	Miocene	Neroly Formation	Fine to coarse-grained marine lithic sandstones	East	Vertebrates, invertebrate, plants	High
Tmk	Eocene	Markley Formation	Fine to coarse-grained quartz-muscovite and quartz-lithic sandstone and siltstone	West, East	Fish remains and invertebrates	High
Kg, Kf, Ks	Cretaceous	Great Valley Sequence (Guinda, Funks, and Sites formations)	Deep-marine sandstones and siltstones	West, East	Rare invertebrates (ammonoids) and marine microfossils	Low

Table Notes:

A. Symbols correspond to map on **Figure 2.2-5**

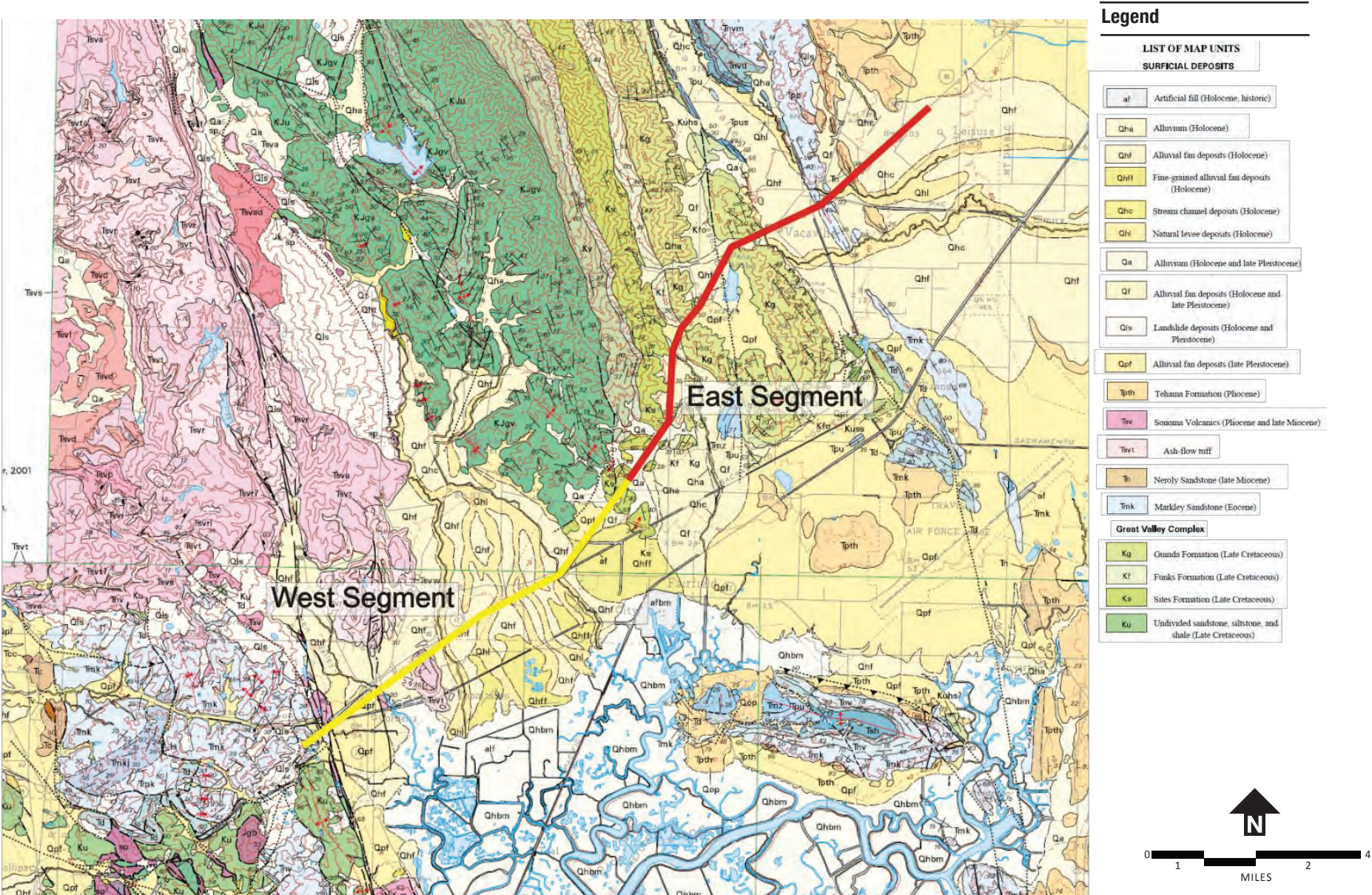
Source: Caltrans, 2014n

### *Cretaceous Great Valley Sequence*

The Early to Late Cretaceous Great Valley Sequence is composed of interbedded sandstones, mudstones, and shales deposited on a submarine fan along the continental margin. Within the project limits the Great Valley Sequence has been differentiated into three separate formations:

- **Sites Formation:** The Sites Formation crops out towards the eastern end of the West Segment, from just west of the Waterman Boulevard/Airbase Parkway intersection to the eastern project limits. It also crops out within the East Segment from the western project limits to just north of the Soda Springs Road/Lyon Road intersection.
- **Funks Formation:** The Funks Formation crops out only within the East Segment, from the Dickson Hill Road/North Texas Street intersection to just south of the Blue Mountain Drive/Lyon Road intersection near the City of Fairfield.
- **Guinda Formation:** The Guinda Formation crops out within the East Segment from north of the Soda Springs Road/Lyon Road intersection, along Nelson Road north of Manuel Campos Parkway, at the Lagoon Valley Road/Lyon Road intersection, and where Cherry Glen Road joins I-80 within and near the City of Fairfield.





Paleontological Deposits

Figure

2.2-5

Source: Caltrans, 2014n

Marine fossils and microfossils have been reported from the Sites, Funks, and Guinda Formations. Reports of other invertebrate fossil localities without catalogued specimens have been documented in all three geologic units from Yolo and Glenn counties. However, none of the reported fossil localities are from Solano County. No vertebrate remains have been previously reported from the Great Valley Sequence stratigraphic units exposed in the study area. During the field survey, unidentifiable plant fragments were observed at a construction site just south of the project limits, located near the North Texas Street and Manual Campos Parkway intersection within the City of Fairfield. While these fossils are not significant, they indicate that conditions favorable for fossil preservation can occur within sediments of the Great Valley Sequence within the study area.

#### *Eocene Markley Formation*

The Markley Formation consists of fine- to coarse-grained muscovite-rich sandstone and siltstone with thin interbeds of foraminiferal mudstone. Plant debris is locally abundant within the mudstone beds. Within the study area, the Markley Formation occurs at the ground surface near the following locations:

- where Red Top Road crosses I-80, near Cordelia (West Segment)
- between Davis Street and Mason Street, on the north side of I-80, near the City of Vacaville (East Segment)
- between Davis Street and Elmira Road on the south side of I-80, near the City of Vacaville (East Segment)

The Markley Formation has produced an extremely diverse and important assemblage of fossils, including invertebrates and fish. Owing to the favorable conditions for fossil preservation and the significant fossils previously reported from this unit, the Markley Formation has a high paleontological sensitivity.

#### *Miocene Neroly Formation*

Within the study area, the Neroly Formation is found at the ground surface at the following locations within the East Segment, near the City of Vacaville:

- where Sharpe Road merges with I-80, on the east side of I-80
- along Callen Street, just east of the Callen Street/East Monte Vista Avenue intersection on the west side of I-80

Neroly fossil localities have produced an extremely diverse and important assemblage of fossils, including plants and animals. The floral assemblage is particularly significant as it provides important data for the reconstruction of the paleotopography and paleoclimate of the western United States during the middle to late Miocene. Because significant fossils have been previously reported from this unit, the Neroly Formation has a high paleontological sensitivity.



### *Pliocene Tehama Formation*

Within the study area, the Tehama Formation crops out only in the East Segment and is present between:

- Allison Drive and Callen Street to the north of I-80
- Allison Drive and Travis Way south of I-80

The Pliocene Tehama Formation is composed of fluvial sedimentary deposits of semi-consolidated pale-green, gray, and tan sand, tuffaceous sand, silt, and clay with discontinuous lenses of gravel that coarsen to the west. Locally, the Tehama Formation forms rounded hills with moderate relief and a thin soil cover.

The diverse fossil assemblage from the Tehama Formation documents faunal and environmental conditions in California not long before the Pleistocene transition. Because vertebrate fossils have been previously reported from this unit, the sediments belonging to the Tehama Formation exists are assigned a high paleontological sensitivity.

### *Pliocene Sonoma Volcanics*

Within the study area, the Pliocene Sonoma Volcanics crop out only along the West Segment in the following locations:

- south of Suisun Parkway on the north side of I-80, between Fairfield Linear Park and Kaiser Drive
- south side of I-80, north of Cordelia Road, between Mountain Meadow Drive and Fairfield Linear Park

The majority of the volcanic units are poorly fossiliferous. However, the sedimentary units, such as the lacustrine and fluvial deposits, and some of the tuffs, are fossiliferous and have previously produced vertebrate fossils as well as highly significant fossil floras, including a petrified forest near Calistoga. Because vertebrate fossils have been previously reported from this unit, the Sonoma Volcanics are assigned a high paleontological sensitivity.

### *Pleistocene Alluvial Deposits*

Pleistocene alluvial deposits occur at or near the surface along the entire project limits and consist of crudely bedded, moderately to poorly sorted, brown gravely and clayey sand that fines upward to sandy clay. These deposits are located along ancient stream channels and can be distinguished from younger alluvial deposits by their higher topographic position, greater degree of dissection, development of alfisols, and lesser permeability than younger deposits.<sup>6</sup>

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<sup>6</sup> Alfisols are a soil order in USDA soil taxonomy. Alfisols form in semiarid to humid areas, typically under a hardwood forest cover. They have a clay-enriched subsoil and relatively high native fertility. "Alf" refers to aluminum (Al) and iron (Fe).

Sedimentary units mapped as Pleistocene Alluvium in Solano County have previously produced abundant fossils representing many extinct taxa. Although no indications of fossils were seen at the surface in the exposed Pleistocene Alluvium during the field survey, since abundant fossil vertebrates have been previously reported elsewhere from this unit in similar sediments. There is a potential that additional significant paleontological resources will be found in sediments of the Pleistocene Alluvium during excavations for the Build Alternative. Because vertebrate fossils have previously reported from this unit and from localities not far from the study area, the Pleistocene alluvial deposits are assigned a high paleontological sensitivity.

#### *Holocene Alluvial Deposits*

Within the study area, the alluvial deposits may be found at the surface along the entire project limits, and consist poorly sorted, and moderately to poorly bedded, clay, silt, sand, and gravel deposited in fan, valley fill, terrace, or basin environments. These deposits are too thin and too young for the preservation of fossils and, over much of the study area, are already disturbed. This unit is, therefore, assigned a low paleontological sensitivity.

#### *Artificial Fill*

Because artificial fill is manmade, it has no potential to produce significant fossils. Any fossils found in artificial fill would not be considered paleontologically significant since they are no longer in-situ, and as such, have been removed from their stratigraphic context.

## ENVIRONMENTAL CONSEQUENCES

### **Build Alternative**

The Build Alternative includes a wide range of construction activities. However, only those that could potentially impact significant paleontological resources, typically through excavation or earth-moving, are of concern. Both segments of the Build Alternative would have excavation activities that could potentially impact geological units of both high and low sensitivities for producing significant paleontological resources.

Potential effects to paleontologically sensitive geological units would be avoided to a large extent because most of the construction work associated with the Build Alternative would occur within the existing I-80 right-of-way. Artificial fill and previously disturbed sediment underlie most, if not all of, the freeway right-of-way to a depth of 3 to 6 feet. Planned clearing, grading, augering, and excavations associated with the Build Alternative that only disturbs the artificial fill or previously disturbed material would not result in adverse effects to paleontological resources.

However, because highly sensitive sediments are found at or near the surface along some sections of the study area, any ground disturbance deeper than 3-6 feet could have adverse effects on significant paleontological resources. Other construction activities that could adversely impact paleontological resources could include:

- excavations for overhead sign foundations (22-45 feet below ground surface) and reader foundations (estimated depth of 11 feet)
- modification of drainage ditches
- modification of structures (East Segment)
- construction of retaining walls (East Segment)

### **West Segment – Fundable First Phase**

The risks associated with the local geology and paleontological sensitivities described above for the Build Alternative are applicable to the West Segment. Excavations for the West Segment could impact the Sites Formation of the Great Valley Sequence, the Markley Formation, the Sonoma Volcanics, and Pleistocene and Holocene alluvial deposits. Of these geological units, the Markley, and Neroly formations, as well the Sonoma Volcanics and Pleistocene alluvial deposits have a high potential for producing significant paleontological resources.

As previously discussed, potential effects to paleontologically sensitive geological units would be avoided to a large extent because most of the construction work would not create ground disturbance greater than 3 to 6 feet below ground surface, and would occur within the existing I-80 right-of-way. This is particularly true for the proposed West Segment improvements that are mostly related to the restriping and repurposing of existing HOV lanes.

### **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 transportation 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**

### **Mitigation Measure PAL-A: Monitoring and Mitigation Program**

During the final design phase of the project, a qualified professional paleontologist 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

This program will be described in the Paleontological Mitigation Plan (PMP), which will be prepared by the qualified professional paleontologist during the design phase of the project. The PMP will also describe fieldwork and laboratory methods; curation requirements; report format, content, and distribution; and proposed staff and their qualifications.

Prior to the start of construction, the professional paleontologist would conduct a field survey of exposures of sensitive geological 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 units with low potential to produce significant fossils (i.e., Guinda, Sites, and Funks formations of the Great Valley Sequence; and Holocene Alluvial deposits) and solely within previously disturbed material underlying the I-80 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.

### **West Segment–Fundable First Phase**

**Mitigation Measure PAL-1** is applicable to the West Segment. No avoidance, minimization, or mitigation measures specific to West Segment 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. The RCRA provides for “cradle to grave” regulation of hazardous waste generated by operating entities. Other federal laws include:

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

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

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

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

## AFFECTED ENVIRONMENT

The analysis summarized in this section is based on an Initial Site Assessment (ISA) prepared for the project (Caltrans, 2014i). 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 potential concern, a review of historical and current land use information, and a site reconnaissance survey 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 one 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 potential impacts to the project.

The limits of the ISA database searches and survey 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.

### Summary of Findings

The ISA identified several hazardous material release sites and former land uses that may have contaminated soils and/or groundwater that would potentially 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-80 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*

A search of environmental regulatory databases was conducted for the I-80 corridor and surrounding properties within the project limits. The sites identified in the database search were evaluated with respect to their potential to adversely affect the soils and/or groundwater that would be encountered during project construction. Three main criteria were used to evaluate whether the listed sites warranted further consideration: (1) proximity to the site (less than 1/8 mile); (2) hydraulically upgradient with respect to groundwater flow; and (3) hydraulically upgradient of the site with respect to surface water flow/storm water runoff.

In 2012 California Regional Water Quality Control Board adopted a new set of standards for closure of sites impacted with petroleum hydrocarbons (e.g., gasoline and/or diesel). In summary, these low risk standards allow for site closure if the plume is well defined, there are no free-floating hydrocarbons in the groundwater, there are no bodies of water nearby, and vapor risk to future occupants are mitigated. While many sites have been granted closure, there is still a potential risk that the site may adversely impact adjacent sites. Accordingly, the analysis of potential release sites included “closed” sites.

Within the West Segment, the regulatory review did not identify any listed sites that would be of potential concern. Within the East Segment, the regulatory review identified the seven sites that would be of potential concern, as listed in **Table 2.2-15**.

**Table 2.2-15 Hazardous Release Sites of Potential Concern – East Segment**

Site	Name and Location	Status
1	ARCO #2067 Service Station, 310 Orange Drive, Vacaville	This site is currently undergoing groundwater monitoring. During the site visit groundwater monitoring wells were observed on Orange Drive between this site and I-80 entrance. Review of the 4th Quarter 2012 groundwater monitoring report, reveals a gentle groundwater gradient trending towards the freeway right-of-way. Two of the monitoring wells located on the west side of Orange Drive MW18, and MW-26 showed historical presence of methyl tertiary butyl ether MTBE (a harmful, carcinogenic gasoline additive) in the groundwater. This indicates that MTBE may have impacted the groundwater within the project limits where construction activities may occur.
2	Shell Service Station, 1611 Monte Vista Avenue E, Vacaville	This site is listed as “closed”; however, review of the last groundwater monitoring report (May 2013) indicates a flat gradient with a gentle slope towards the freeway right-of-

Site	Name and Location	Status
		way. The site is a parking lot west of the I-80 on- and off ramps at East Monte Vista Avenue. The report shows presence of MTBE in the groundwater. Wells that are closest to the project limits have the lowest current concentration of MTBE, indicating that potential adverse effects to areas where project construction would occur are unlikely.
3	Former Chevron Service Station, 1615 East Monte Vista, Vacaville	The previous site improvements and service station structures at this site have been removed. The site is now covered by the realigned East Monte Vista Road and I-80 on-ramp. However, because groundwater contamination is present, groundwater monitoring is ongoing. The gradient of groundwater flow is towards the freeway right-of-way. The latest quarterly groundwater monitoring report indicates presence of high levels of MTBE in the groundwater. As the right-of-way is adjacent to this site, groundwater is likely impacted at locations where project construction would occur.
4	Valero Service Station, 1501 East Monte Vista, Vacaville	This site contains elevated concentrations of MTBE, Benzene and other petroleum hydrocarbons. Because the site is located adjacent to the freeway right-of-way, there is potential that these contaminants might have migrated into areas where project construction would occur.
5	Autocraft Collision, 1275 Callen Street, Vacaville	This site contains elevated concentrations of benzene and other petroleum hydrocarbons. The downgradient extent of contamination has not been characterized; however, due to the site's proximity to the project limits, it is likely for the contaminated groundwater might have reached the areas where project construction would occur.
6	ARCO # 2184 Service Station, 3560 Nelson Road, Fairfield	This site is currently undergoing remediation. Recent groundwater data showed gradient is towards the freeway right-of-way and MTBE and benzene are present in the groundwater. As this site is adjacent to the project limits, there is potential that the contaminants might have impacted the areas where project construction would occur.
7	Stans Service Center, 3350 N Texas Road, Fairfield	The site is a non-operating Chevron service station. Review of one of the latest groundwater monitoring reports indicates petroleum hydrocarbons are present in groundwater. As this site is adjacent to the project limits, there is potential that these contaminants might have migrated into the areas where project construction would occur.

Source: Caltrans, 2014i

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-80 corridor. 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. During the design phase of the project, a preliminary site investigation would be performed to investigate potential hazardous materials concerns related to soil and groundwater within the project limits, as identified in the ISA (see **Measure HAZ-1**). Delaying subsurface investigations until the 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. The I-80 corridor has supported vehicular activity since the 1940s. 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 the modification of overpass/bridge 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 potentially pose a risk to human health.<sup>7</sup> 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.

#### *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.

#### *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 potentially be present in shallow soils along the I-80 corridor where former agricultural development existed and/or currently exists.

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<sup>7</sup> [ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ms/59/MS59\\_Plate.pdf](ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ms/59/MS59_Plate.pdf); accessed November 13, 2013

### *Railroad Crossings*

There is a railroad crossing between Red Top Road and SR 12, within the West Segment of the project limits. I-80 travels under an existing railroad bridge structure. Since the railroad tracks are above the freeway, and the Build Alternative does not involve any work within railroad corridor, no environmental effects from railroad operations is expected.

#### **West Segment –Fundable First Phase**

Within the West Segment, the regulatory review did not identify any listed sites that would be of potential concern. Contaminants of concern that could potentially be encountered in soil and/or groundwater during excavation activities within the West Segment are limited to those summarized above under “other environmental concerns”.

#### **No-Build Alternative**

The No-Build Alternative assumes that the freeway travel lanes along I-80 would remain as they currently exist. No bridge structures would be widened or replaced. Therefore, the No-Build Alternative would avoid the health risks associated with the hazardous materials within the I-80 Corridor in the project limits.

### **AVOIDANCE, MINIMIZATION, AND/ OR MITIGATION MEASURES**

#### **Build Alternative**

**Measure HAZ-1:** During the design phase of the project, a preliminary site investigation would be performed to investigate potential hazardous materials concerns related to soil and groundwater 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 potential hazardous materials issues if concerns are identified during the preliminary site investigation. The preliminary site investigation report for the project would be provided to project contractors so that the findings can be incorporated into their Health and Safety and Hazard Communication Programs. The general areas and contaminants of concern for investigating soil and groundwater 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**). If such implementation occurs, required coordination with the Alameda County Department of Environmental Health (ACDEH) Certified Unified Program Agency (CUPA) would occur. The ACDEH CUPA is the administrative agency that coordinates and enforces numerous local, state, and federal hazardous materials management and environmental protection programs in the county.

**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 potential health and safety hazards to workers and the public. In accordance with Caltrans' standard special provision related to earth work, the contractor would be notified that lead will be present in the construction area, and would be required to prepare a lead compliance plan to prevent or minimize worker exposure to lead. Caltrans soil sampling requirements for potential reuse of lead-contaminated soil are summarized further below.

**Measure HAZ-3:** An asbestos and lead-based paint survey would be conducted by a qualified professional for the bridge structures that are subject to demolition as part of the Build Alternative. All loose and peeling lead-based paint and asbestos-containing material would be removed prior to the demolition of the bridge structure by a certified contractor(s) in accordance with local, state, and federal requirements.

**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. Alternatively, yellow stripe and pavement markings may be managed in accordance with Caltrans standard special provision 14-11-07.

#### *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 the work plan that has been reviewed and approved by Caltrans. Soil samples collected would be analyzed for total lead and soluble lead to evaluate potential reuse of lead-affected soils in accordance with the Department of Toxic Substances Control's variance issued to Caltrans. Soil and groundwater analytical results would 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 \$375,000. 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.

#### **West Segment – Fundable First Phase**

The discussion above identified all avoidance, minimization, and mitigation measures applicable to the Built Alternative, including the West Segment. However, because documented hazardous material release sites that are likely to affect the soils/groundwater where West Segment project construction were not identified, subsurface sampling would be less intensive, and only related to



the determination of ADL levels and pesticides associated with agricultural land uses. Implementation of the subsurface sampling in the high-risk areas within the West Segment is anticipated to cost approximately \$150,000. The soil and groundwater sampling would likely be a one-month endeavor, assuming property access and approval of the work plan is obtained in a timely fashion.

## 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 United States Environmental Protection Agency (U.S. EPA) and California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM<sub>10</sub>) and particles of 2.5 micrometers and smaller (PM<sub>2.5</sub>), and sulfur dioxide (SO<sub>2</sub>). In addition, national and state standards exist for lead (Pb) and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H<sub>2</sub>S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

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

### Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional—or, planning and programming—level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations (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<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and in some areas (although not in California) sulfur dioxide (SO<sub>2</sub>). California has attainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO<sub>2</sub>, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years for the RTP) and 4 years (for the TIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA), make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Conformity analysis at the project-level includes verification that the project is included in the regional conformity analysis and a “hot-spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter (PM<sub>10</sub> or PM<sub>2.5</sub>). A region is “nonattainment” if one or more of the monitoring stations in the region measures 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 redesignated 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 Report prepared for the project (Caltrans, 2014a). The project is located within two different air basins within the jurisdictional boundaries of the Bay Area Air Quality Management District (BAAQMD) and Yolo-Solano Air Quality Management District (YSAQMD), respectively. BAAQMD oversees the western portions of the project limits within the communities of Fairfield, Benicia, Suisun City, and Vallejo, which are located within the San Francisco Air Basin (SF Air Basin). YSAQMD oversees the easternmost portion of the project limits within the City of Vacaville, which is located within the Sacramento

Valley Air Basin (SV Air Basin). The boundary between these air basins is about 1.5 miles north of Manuel Campos Parkway, as shown in **Appendix D**. These air basins effectively make up the air quality study area for the Build Alternative.

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 (Fahrenheit) for the region are in the upper 80's and 90's, while winter maximum temperatures are in the high 50's or low 60's. Minimum temperatures usually range from the high 50's in the summer to the upper 30's and low 40's in the winter. Rainfall in the area occurs mostly in the months of November through mid-April. 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**

The BAAQMD and YSAQMD monitor pollutants of concern, known as criteria pollutants, and air quality conditions throughout the SF Air Basin and SV Air Basin, respectively. **Table 2.2-16** includes a summary of the applicable air quality standards, the typical sources of pollutants and their associated health effects. **Tables 2.2-17** and **2.2-18** summarize each basin's attainment status' with respect to the air quality standards.

As shown in **Tables 2.2-17** and **2.2-18**, the SF Air Basin and SV Air Basin are not in attainment of State or Federal standards with respect to O<sub>3</sub> or PM<sub>2.5</sub>. In addition, neither air basin is in attainment of State standards for PM<sub>10</sub>.

Table 2.2-16 State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State <sup>8</sup> Standard	Federal <sup>8</sup> Standard	Principal Health and Atmospheric Effects	Typical Sources
Ozone (O <sub>3</sub> ) <sup>2</sup>	1 hour 8 hours	0.09 ppm 0.070 ppm	--- <sup>4</sup> 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.
Carbon Monoxide (CO)	1 hour 8 hours 8 hours (Lake Tahoe)	20 ppm 9.0 ppm <sup>1</sup> 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.
Respirable Particulate Matter (PM <sub>10</sub> ) <sup>2</sup>	24 hours Annual	50 µg/m <sup>3</sup> 20 µg/m <sup>3</sup>	150 µg/m <sup>3</sup> --- <sup>2</sup>  (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 <sub>10</sub> .	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.
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>2</sup>	24 hours Annual 24 hours (conformity process <sup>5</sup> ) Secondary Standard (annual; also for conformity process <sup>5</sup> )	--- 12 µg/m <sup>3</sup> --- ---	35 µg/m <sup>3</sup> 12.0 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>  15 µg/m <sup>3</sup>  (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 <sub>2.5</sub> size range. Many toxic & other aerosol and solid compounds are part of PM <sub>2.5</sub> .	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.

Pollutant	Averaging Time	State <sup>8</sup> Standard	Federal <sup>8</sup> Standard	Principal Health and Atmospheric Effects	Typical Sources
Nitrogen Dioxide (NO <sub>2</sub> )	1 hour  Annual	0.18 <a href="#">ppm</a>  0.030 <a href="#">ppm</a>	0.100 <a href="#">ppm</a> <sup>6</sup> (98th percentile over 3 years) 0.053 <a href="#">ppm</a>	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.
Sulfur Dioxide (SO <sub>2</sub> )	1 hour  3 hours 24 hours	0.25 <a href="#">ppm</a>  --- 0.04 <a href="#">ppm</a>	0.075 <a href="#">ppm</a> <sup>7</sup> (99th percentile over 3 years) 0.5 <a href="#">ppm</a> <sup>9</sup>	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.
Lead (Pb) <sup>3</sup>	Monthly Rolling 3-month average	1.5 <a href="#">µg/m<sup>3</sup></a> ---	--- 0.15 <a href="#">µg/m<sup>3</sup></a> <sup>11</sup>	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.
Sulfate	24 hours	25 <a href="#">µg/m<sup>3</sup></a>	---	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.
Hydrogen Sulfide (H <sub>2</sub> S)	1 hour	0.03 <a href="#">ppm</a>	---	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.
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative	---	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	See particulate matter above. May be related more to aerosols than to solid particles.

Pollutant	Averaging Time	State <sup>8</sup> Standard	Federal <sup>8</sup> Standard	Principal Health and Atmospheric Effects	Typical Sources
		humidity less than 70%		National Parks and other "Class I" areas. However, some issues and measurement methods are similar.	
Vinyl Chloride <sup>3</sup>	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes

Notes: ppm = parts per million; µg/m<sup>3</sup> = 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<sub>10</sub> NAAQS revoked October 2006; was 50 µg/m<sup>3</sup>. 24-hr. PM<sub>2.5</sub> NAAQS tightened October 2006; was 65 µg/m<sup>3</sup>. Annual PM<sub>2.5</sub> NAAQS tightened from 15 µg/m<sup>3</sup> to 12 µg/m<sup>3</sup> December 2012 and secondary annual standard set at 15 µg/m<sup>3</sup>.
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<sub>10</sub> and, in larger proportion, PM<sub>2.5</sub>. Both the ARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and PM<sub>2.5</sub> 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 S.F. Bay Area.
5. The 65 µg/m<sup>3</sup> PM<sub>2.5</sub> (24-hr) NAAQS was not revoked when the 35 µg/m<sup>3</sup> NAAQS was promulgated in 2006. The 15 µg/m<sup>3</sup> annual PM<sub>2.5</sub> standard was not revoked when the 12 µg/m<sup>3</sup> 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<sub>2</sub> 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<sub>2</sub> 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.

Greenhouse Gases and Climate Change: Greenhouse gases do not have concentration standards for that purpose. Conformity requirements do not apply to greenhouse gases.

Source: Caltrans, 2014a

**Table 2.2-17 Attainment Status – San Francisco Air Basin**

Pollutant	Federal Status	State Status
Ozone (O <sub>3</sub> ) – 1-Hour Standard	Not Applicable	Nonattainment
Ozone (O <sub>3</sub> ) – 8-Hour Standard	Nonattainment	Nonattainment
Respirable Particulate Matter (PM <sub>10</sub> )	Unclassified	Nonattainment
Fine Particulate Matter (PM <sub>2.5</sub> )	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment (maintenance)	Attainment
Nitrogen Dioxide (NO <sub>2</sub> )	Attainment	Attainment
Sulfur Dioxide (SO <sub>2</sub> )	Attainment	Attainment
Sulfates	No National Standards	Attainment
Lead	Attainment	Not Applicable
Hydrogen Sulfide	No National Standards	Unclassified
Visibility Reducing Particles	No National Standards	Unclassified

Source: Caltrans, 2014a

**Table 2.2-18 Attainment Status – Sacramento Valley Air Basin**

Pollutant	Federal Status	State Status
Ozone (O <sub>3</sub> ) – 1-Hour Standard	Not Applicable	Nonattainment
Ozone (O <sub>3</sub> ) – 8-Hour Standard	Nonattainment	Nonattainment
Respirable Particulate Matter (PM <sub>10</sub> )	Unclassified	Nonattainment
Fine Particulate Matter (PM <sub>2.5</sub> )	Partial Nonattainment	Not Applicable
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO <sub>2</sub> )	Attainment	Attainment
Sulfur Dioxide (SO <sub>2</sub> )	Attainment	Attainment
Sulfates	No National Standards	Attainment
Lead	Attainment	Not Applicable
Hydrogen Sulfide	No National Standards	Unclassified
Visibility Reducing Particles	No National Standards	Unclassified

Source: Caltrans, 2014a

Within three years of the effective date of designations, nonattainment areas for PM<sub>2.5</sub> 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<sub>2.5</sub> 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 SF Air Basin has attained the PM<sub>2.5</sub> NAAQS. This proposed determination is based on recent ambient air monitoring data showing that the SF Air Basin has monitored attainment of the PM<sub>2.5</sub> 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<sub>2.5</sub>, as well as precursor pollutants that contribute to formation of secondary particulate matter and amendments to BAAQMD's New Source Review to address PM<sub>2.5</sub>. The SF Air Basin PM<sub>2.5</sub> emission inventory was submitted to the U.S. EPA on January 14, 2013. The SV Air Basin was designated “partial non-attainment” as it was included as part of a larger PM<sub>2.5</sub> non-attainment area. The YSAQMD is currently developing an attainment plan for PM<sub>2.5</sub>.

## ENVIRONMENTAL CONSEQUENCES

### 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 2015 Regional Transportation Improvement Program (RTIP), page S3-282 (RTP Reference No. 230659 and 230660 and TIP ID SOL110001<sup>8</sup>). The MTC 2015 RTIP was determined to conform by FHWA and FTA on December 15, 2014. The design concept and scope of the proposed project is consistent with the project description in the 2013 RTP, 2015 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-80 where there would be a combination of the highest traffic volumes, greatest project traffic contribution, and highest level of congestion. High volume freeways, such as I-80, 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 2.2-19**.

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

<sup>8</sup> The project was originally listed under the two TIP numbers SOL110001 and SOL110002 (relative to the East and West Segments). TIP Amendment No. 2013-16 combined the two segments under one TIP ID SOL110001, and reprogramed the funding sources and phases.



polluting) vehicles replacing older vehicles. As a result, the project would not cause or contribute to any localized carbon monoxide violations; and therefore, meets the “hot-spot” conformity requirements of 40 CFR 93.116(a).

**Table 2.2-19 Worst-Case 1-Hour and 8-Hour Carbon Monoxide Concentrations (ppm)**

Roadway Segment	Existing		2020 No-Build		2020 Build		2040 No-Build		2040 Build	
	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr
<b>West Segment</b>										
Receiver 1 East of Suisun Valley Road	6.3	5.0	4.3	3.4	4.4	3.5	4.0	3.2	4.1	3.2
Receiver 2 Buckingham Drive/Flint Way	5.9	4.7	4.2	3.3	4.2	3.3	3.9	3.1	3.9	3.1
NAAQS	35	9	35	9	35	9	35	9	35	9
CAAQS	20	9.0	20	9.0	20	9.0	20	9.0	20	9.0
<b>East Segment</b>										
Receiver 3 Piedmont Court/East of Alamo Drive	5.8	4.6	4.1	3.2	4.1	3.2	3.8	3.0	3.9	3.1
Receiver 4 Paradise Valley Road and Manuel Campos Parkway	5.7	4.5	4.0	3.2	4.0	3.2	4.0	3.2	3.9	3.1
NAAQS	35	9	35	9	35	9	35	9	35	9
CAAQS	20	9.0	20	9.0	20	9.0	20	9.0	20	9.0

Note: ppm = parts per million  
Source: Caltrans, 2014a

### *Particulate Matter*

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<sub>2.5</sub> and PM<sub>10</sub> nonattainment and maintenance areas (71 FR 12468). The Federal PM<sub>10</sub> standards have been met in the SF Air Basin and SV Air Basin, and therefore the Build Alternative is not subject to hot spot analysis for PM<sub>10</sub> for purposes of transportation conformity. However, because the Federal PM<sub>2.5</sub> standards are exceeded in both air basins, certain criteria must be met in order for the project to be subject to hot spot analysis for

PM<sub>2.5</sub> for purposes of transportation conformity. MTC's Air Quality Conformity Task Force met on September 25, 2012 as part of interagency consultation for the Build Alternative and took action to conclude that the Build Alternative was not a project of air quality concern (POAQC).

#### *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 125,000 annual average daily traffic (AADT). Caltrans reports annual average daily traffic volumes of 121,000 to 214,000 vehicles per average day. Traffic levels in the future would increase above 125,000 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 AADD, and where 8 percent or more of such AADD is diesel truck traffic.<sup>9</sup> The design year for the Build Alternative for traffic is projected to exceed 140,000 to 150,000 AADD, which is above the 125,000 AADD in the FHWA guidance. However, the truck percentage and truck AADD is less than 8 percent and the AADD 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.

<sup>9</sup> *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in PM<sub>2.5</sub> and PM<sub>10</sub> 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. However, there are several uncertainties that do not allow quantitative estimates of health effects from MSAT emissions in the project limits. One can examine MSAT emissions in the project limits and estimate the relative impacts of MSAT emissions under different scenarios. **Table 2.2-20** represents the total MSAT emissions from traffic on I-80 for five scenarios as listed. As shown in the table emissions for all MSATs are projected to decrease considerably over existing conditions. However, due to an increase in traffic and speed, diesel particulate matter would be about six percent higher than the No-Build scenario.

#### *Additional Environmental Analysis*

The SF Air Basin and SV Air Basin are considered a nonattainment area for ground-level ozone and PM<sub>2.5</sub> under both the federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for PM<sub>10</sub> under the California Clean Air Act, but not the federal Act. 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 Build Alternative is included in Plan Bay Area 2040 and 2015 TIP, which conform to the SIP, the project would not result in a considerable net increase of any criteria pollutant.

**Table 2.2-20 Project MSAT Emissions in Grams per Day**

Pollutant	Existing	2020 No-Build	2020 Build	2040 No-Build	2040 Build
Benzene	18,471	8,035	8,059	7,288	7,762
Acrolein	735	290	291	267	285
Formaldehyde	19,108	7,370	7,392	7,226	7,693
Butadiene	3,303	1,283	1,287	1,193	1,271
Naphthalene	1,024	580	582	702	748
POM	335	129	129	156	166
Diesel PM	51,404	14,593	14,637	16,705	17,794
DEOG	57,954	23,279	23,340	24,072	25,603

Notes: POM = Polycyclic Organic Matter; Diesel PM = Diesel Particulate Matter; DEOG = Diesel Exhaust Organic Gas  
Source: Caltrans, 2014a

### *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*

#### Airborne Dust and Emissions

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<sub>10</sub> is the pollutant of greatest concern associated with dust. If uncontrolled, elevated PM<sub>10</sub> levels could occur downwind of actively disturbed areas. In addition, dust fall on adjacent properties could be a nuisance.

Emissions from construction equipment also are expected, and would include carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), directly-emitted particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and toxic air contaminants such as diesel exhaust particulate matter. As previously discussed, ozone is a regional pollutant that is derived from NO<sub>x</sub> and VOCs in the presence of sunlight and heat.

Average daily construction exhaust emissions were modeled for the East Segment using the construction year (2015), total expected duration (2 years) and the length of the segment 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 2.2-21** presents these emissions predictions for the East Segment of the Build Alternative.

However, for the West Segment, the scope of construction would be limited to installation and removal of signage, restriping, lighting installation, the extension of an auxiliary lane, and other work that would occur over a relatively short time. No major heavy equipment usage is proposed for any substantial period of time. Therefore, construction exhaust and evaporative emissions from construction activities associated with the West Segment have not been quantified.

**Table 2.2-21 Daily Maximum Construction Emissions – East Segment**

Construction Phase	Pollutant					
	ROG	NO <sub>x</sub>	Exhaust PM <sub>10</sub>	Fugitive Dust PM <sub>10</sub>	Exhaust PM <sub>2.5</sub>	Fugitive Dust PM <sub>2.5</sub>
Grubbing/Land Clearing	5.9 lbs/day	40.2 lbs/day	1.9 lbs/day	25 lbs/day	1.7 lbs/day	5.2 lbs/day
Grading/Excavation	7.0 lbs/day	51.3 lbs/day	2.4 lbs/day	25 lbs/day	2.2 lbs/day	5.2 lbs/day
Drainage/Utilities/Sub-grade	3.6 lbs/day	24.3 lbs/day	1.4 lbs/day	25 lbs/day	1.6 lbs/day	5.2 lbs/day
Paving	3.0 lbs/day	16.4 lbs/day	1.2 lbs/day	--	1.1 lbs/day	--
<i>BAAQMD Significance Thresholds (for comparison only)</i>	<i>54 lbs/day</i>	<i>54 lbs/day</i>	<i>82 lbs/day</i>	<i>BMP</i>	<i>54 lbs/day</i>	<i>BMP</i>
<i>YVAQMD Significance Thresholds (for comparison only)</i>	<i>10 tons/year</i>	<i>10 tons/year</i>	<i>80 lbs/day</i>	<i>BMP</i>	<i>--</i>	<i>BMP</i>

Note: BMP – Best Management Practices  
Source: Caltrans, 2014a

Construction activities will not last for more than 24 months 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)).

#### Mobile Source Air Toxics (MSAT)

Construction activity may generate a temporary increase in MSAT emissions. Project-level assessments that render a decision to pursue construction emission mitigation will benefit from a number of technologies and operational practices that should help lower short-term MSATs.

**Measure AIR-1** and **AIR-3** help to address these short-term MSAT emissions.

#### **West Segment – Fundable First Phase**

Environmental effects applicable to the Build Alternative are also applicable to West Segment. There are no anticipated average daily emissions specific to the West Segment that would change the regional conformity conclusions. All conformity determination applicable to the Build Alternative would apply to the West Segment.

#### **No-Build Alternative**

The No Build Alternative assumes that the existing I-80 would remain in place and no further action of improvements would occur. The currently planned and funded transportation 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<sub>10</sub>, PM<sub>2.5</sub> 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. These 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.

#### **West Segment – Fundable First Phase**

Caltrans' standard specifications and dust control measures are applicable to the entire Build Alternative alignment, including the West Segment. No avoidance, minimization, or mitigation measures would be required beyond the implementation of the Caltrans' standard specifications.

#### **CLIMATE CHANGE**

Climate change is analyzed at the end of this chapter (see **Section 2.5, Climate Change**). Neither the United States Environmental Protection Agency (U.S. EPA) nor Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website ([http://www.fhwa.dot.gov/environment/climate\\_change](http://www.fhwa.dot.gov/environment/climate_change)), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will aid decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

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

## 2.2.7 NOISE

### REGULATORY SETTING

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

#### California Environmental Quality Act

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

#### National Environmental Policy Act and 23 CFR772

For highway transportation projects with FHWA (and the Department, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur, as shown in **Table 2.2-22**. The NAC differ depending on the type of land use under analysis. Noise levels are expressed in terms of the A-weighted decibel (dBA) and the one-hour equivalent sound level (Leq[h]). For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis.

**Table 2.2-22 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 <sup>A</sup>	67 (Exterior)	Residential.
C <sup>A</sup>	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.



Activity Category	NAC, Hourly A-Weighted Noise Level, Leq(h)	Description of Activity Category
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:

A. Includes undeveloped lands permitted for this activity category.

Source: Caltrans, 2011. Traffic Noise Analysis Protocol

**Figure 2.2-6** lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with noise levels of common activities.

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.

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 the noise analysis was obtained through the Noise Study Report prepared for the project (Caltrans, 2014m). 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 significant sources of noise, the relative elevation of roadways and receptors, and any intervening structures or barriers. The noise study area was divided into six segments for noise modeling and noise abatement assessment purposes. **Appendix G** shows the sensitive land use locations and the sensitive receptor locations that were modeled in each noise study segment.

### **Noise Modeling**

Short- and long-term field measurements were taken to document the current noise environment within the noise study area (see **Appendix G**). Noise measurement locations were used as noise modeling receivers for the prediction of existing and future worst-hour traffic noise levels.

Long-term (LT) noise measurements were made at six (6) locations along the I-80 corridor to quantify the daily trend in noise levels and to establish the peak traffic noise hour. The noise measurements were made in August, October, and November 2012, over periods ranging from one to three days. Long-term noise measurement locations were selected to generally represent human activity areas such as residential rear yard areas adjoining I-80 or in areas considered to be acoustically equivalent to noise-sensitive exterior use areas.

Fifty-eight (58) short-term (ST) 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. Thirty-four (34) short-term noise measurements were made along the corridor in Fairfield, and twenty-four (24) short-term noise measurements were made along the corridor in Vacaville.

**Table 2.2-23** presents the long-term noise measurements. **Table 2.2-24 through Table 2.2-29** summarize short-term noise measurements and calculated worst-hour noise levels by each segment of the noise study area.

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	
Quiet Urban Daytime	50	Large Business Office
		Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
Quiet Rural Nighttime	30	Bedroom at Night,
		Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Noise Levels for Common Activities

Figure

2.2-6

**Table 2.2-23 Summary of Long-Term Noise Measurements**

Receptor ID	Noise Study Segment Number	Location	Date	Worst Hour	Measured Leq[h], dBA During Worst Hour
West Segment					
LT-1	2	End of Mankas Boulevard, Fairfield	10/3/2012	5:00 p.m.	64
			10/4/2012	6:00 a.m.	65
			10/18/2012	9:00 a.m.	68
			10/19/2012	6:00 a.m.	68
East Segment					
LT-2	3	Rear yard of 3418 Ellen Drive, Fairfield	10/18/2012	10:00 a.m.	58
			10/19/2012	7:00 a.m.	58
LT-3	4	Parking lot of Rancho Hotel on Rivera Road, Vacaville	10/25/2012	2:00 p.m.	76
			10/26/2012	9:00 a.m.	75
LT-4	4	~15 feet from existing sound wall, near 195 Fair Oaks Drive, Vacaville	10/25/2012	10:00 a.m.	71
			10/26/2012	6:00 a.m.	72
LT-5	5	Front of 100 Birch Street, Vacaville	11/14/2012	12:00 p.m.	62
			11/15/2012	7:00 a.m.	64
LT-6	5	Front of 128 Sunset Lane, Vacaville	9/12/2012	5:00 p.m.	69
			9/13/2012	5:00 a.m.	64

Notes: LT = Long-term  
Source: Caltrans, 2014m

### 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-80, 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 Fairfield and Vacaville, 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 Solano County.

Land uses in the five segments detailed below include Activity Categories B, C, D, and E; all segments except Segment 6 contain Activity Category B (residences). Worst hour noise levels range from 51 to 72 dBA, and all segments except Segment 6 have noise measurements that approach or exceed the NAC. Each segment is described in more detail below.

*Segment 1 – Red Top Road to Chadbourne Road (West Segment)*

Segment 1 of the noise study area is located in the City of Fairfield, from the westernmost project limit at Red Top Road to Chadbourne Road. This noise study segment contains Activity Category B land uses (residences), Activity Category C land uses (Guru Nanak Sikh Temple, Fairfield Linear Park Trail, and Scandia Family Fun Center), and Activity Category E land uses (Days Inn and Best Western Hotels). As indicated in **Table 2.2-24**, existing worst-hour noise levels at this location are 70 dBA, which exceeds the NAC threshold of 67 dBA. No existing noise barriers were identified within this segment.

**Table 2.2-24 Summary of Existing Noise Measurement in Segment 1 of Noise Study Area**

Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-1	On Fairfield Linear Park Trail near WB I-80, south of Business Center Drive, Fairfield	C(67)	11:50 a.m. - 12:10 p.m.	70

Notes: ST = Short-term; WB = Westbound  
Source: Caltrans, 2014m

*Segment 2 – Chadbourne Road to Air Base Parkway (West Segment)*

Segment 2 of the noise study area is located in the City of Fairfield, from Chadbourne Road to Air Base Parkway. This noise study segment contains Activity Category B land uses (residences), several Activity Category D and E land uses (Extended Stay America Fairfield Hotel, Courtyard by Marriott Fairfield Napa Valley Area, Kindercare Learning Center), and Activity Category C uses (Guru Nanak Sikh Temple, Harvest Valley School, recreational soccer fields, and the Fairfield Linear Park Trail). As indicated in **Table 2.2-25**, existing worst-hour noise levels at short-term measurement locations range from 57 to 71 dBA. Several 8- to 12-foot-high noise barriers shield many of these land uses. One noise measurement at the Fairfield Linear Park Trail near the westbound I-80 off-ramp at Chadbourne Road (ST-2) exceeded the NAC threshold of 67 dBA, and a second noise measurement at the front yard of 1806 Michigan Street (ST-6) approached the NAC threshold of 67 dBA.

**Table 2.2-25 Summary of Existing Noise Measurements in Segment 2 of Noise Study Area**

Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-2	On Fairfield Linear Park Trail near WB I-80 off-ramp at Chadbourne Road, Fairfield	C(67)	11:00 a.m. - 11:20 a.m.	71

Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-3	Rear yard of 2518 Raleigh Court, Fairfield	B(67)	10:40 a.m. - 11:00 a.m.	57
ST-4	Rear yard of 2406 Woolner Avenue, Fairfield	B(67)	10:00 a.m. - 10:20 a.m.	60
ST-5	Rear yard of 1262 Hartford Circle, Fairfield	B(67)	11:30 a.m. - 11:50 a.m.	59
ST-6	Front yard of 1806 Michigan Street, Fairfield	B(67)	11:20 a.m. - 11:40 a.m.	66
ST-7	Rear yard of 1828 Barbour Drive, Fairfield	B(67)	10:00 a.m. - 10:20 a.m.	65
ST-8	Rear yard of 1942 Buckingham Drive, Fairfield	B(67)	12:20 p.m. - 12:40 p.m.	64
ST-9	Front yard of 1971 Buckingham Drive, Fairfield	B(67)	10:10 a.m. - 10:30 a.m.	57
ST-10	Front yard of 1379 Flint Way, Fairfield	B(67)	10:10 a.m. - 10:20 a.m.	58
ST-11	Front yard of 1360 Avon Way, Fairfield	B(67)	12:20 p.m. - 12:40 p.m.	61
ST-12	Rear yard eq. to 2401 Mankas Boulevard (dead end), Fairfield	B(67)	10:00 a.m. - 10:30 a.m.	65

Notes: ST = Short-term; WB = Westbound

1. **BOLD** font indicates noise levels approaching or exceeding NAC.

Source: Caltrans, 2014m

### *Segment 3 – Air Base Parkway to Manuel Campos Parkway (East Segment)*

Segment 3 of the noise study area is located in the City of Fairfield, from Air Base Parkway to Manuel Campos Parkway. This noise study segment contains Activity Category B land uses (residences) and Activity Category D and E land uses (America's Best Value Inn). There is undeveloped land in this segment. As shown in **Table 2.2-26**, existing worst-hour noise levels at the short-term measurement locations range from 53 to 67 dBA. Several 8- to 16-foot-high noise barriers shield sensitive receptors within this segment. Several rear yards of the residences adjacent to the I-80 corridor (ST-20 and ST-22) approached the NAC threshold of 67 dBA.

**Table 2.2-26 Summary of Existing Noise Measurements in Segment 3 of Noise Study Area**

Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-13	Rear yard of 425 Violet Court, Fairfield	B(67)	10:50 a.m. - 11:10 a.m.	56
ST-14	Rear yard of 390 Carnation Drive, Fairfield	B(67)	10:50 a.m. - 11:10 a.m.	63
ST-15	Rear yard of 9 Dali Court (mobile homes), Fairfield	B(67)	10:40 a.m. - 11:00 a.m.	58
ST-16	Rear yard of 2 Dali Court (mobile homes), Fairfield	B(67)	10:40 a.m. - 11:00 a.m.	63
ST-17	Rear yard of 444 Bluebonnet Court, Fairfield	B(67)	11:30 a.m. - 11:50 a.m.	63
ST-18	Rear yard of 2768 Violet Avenue, Fairfield	B(67)	11:40 a.m. - 12:00 p.m.	60
ST-19	Side yard eq. of 2805 Marigold Drive, Fairfield	B(67)	12:20 p.m. - 12:40 p.m.	53
ST-20	Rear yard of 2884 Montclair Way, Fairfield	B(67)	11:10 a.m. - 11:30 a.m.	<b>66</b>
ST-21	Rear yard of 2855 Marigold Drive, Fairfield	B(67)	12:20 p.m. - 12:40 p.m.	61
ST-22	Rear yard eq. of 2100 Greenfield Drive (dead end), Fairfield	B(67)	11:10 a.m. - 11:30 a.m.	<b>67</b>
ST-23	Rear yard of 2957 Marigold Drive, Fairfield	B(67)	12:50 p.m. - 1:10 p.m.	55
ST-24	Front yard of 2021 Hillridge Drive, Fairfield	B(67)	12:00 p.m. - 12:20 p.m.	57
ST-25	Rear yard of 2021 Cliffwood Drive, Fairfield	B(67)	12:10 p.m. - 12:30 p.m.	62
ST-26	Rear yard of 3414 Glen Ellen Drive, Fairfield	B(67)	12:40 p.m. - 1:00 p.m.	59
ST-27	Rear yard of 3522 Glen Ellen Drive, Fairfield	B(67)	12:50 p.m. - 1:10 p.m.	61

Notes: ST = Short-term; WB = Westbound

1. **BOLD** font indicates noise levels approaching or exceeding NAC.

Source: Caltrans, 2014m

*Segment 4 – Manuel Campos Parkway to Alamo Drive (East Segment)*

Segment 4 of the noise study area passes through the cities of Fairfield and Vacaville, from Manuel Campos Parkway to Alamo Drive. This noise study segment contains Activity Category B land uses (residences), Activity Category C land uses (Lagoon Valley Park, Peña Adobe Park, and Paradise Valley Golf Course), and Activity Category D and E land uses (Ranchotel Horse Center, New Life Church, Crossroads Christian Church, and the Alamo Inn). There is also a considerable amount of undeveloped land use in this noise segment. As shown in **Table 2.2-27**, existing worst-hour noise levels at short-term measurement locations (excluding model calibration points) range from 51 to 72 dBA. There is one existing 8-foot-high barrier (Barrier 9), located along the Merchant Street on-ramp to westbound I-80. However, there are several locations within segment 4 of the noise study area the approach or exceed the NAC (ST-34, ST-35, and ST-37).

**Table 2.2-27 Summary of Existing Noise Measurements in Segment 4 of Noise Study Area**

Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-28	Rear yard of 3817 Poppy Hills Court, Fairfield	B(67)	1:30 p.m. - 1:50 p.m.	51
ST-29	Rear yard of 4001 The Masters Drive, Fairfield	B(67)	1:30 p.m. - 1:50 p.m.	54
ST-30	1 <sup>st</sup> -story patio eq. at Rolling Oaks Apts., Fairfield	B(67)	1:20 p.m. - 1:40 p.m.	60
ST-31	Basketball courts at Rolling Oaks Apts., Lyon Road, Fairfield	C(67)	1:20 p.m. - 1:40 p.m.	58
ST-32	Rear yard of 4137 The Masters Drive, Fairfield	B(67)	2:10 p.m. - 2:30 p.m.	58
ST-33	Eastern end of Rolling Oaks Apts., Fairfield	B(67)	1:40 p.m.	61
ST-34	New Life Church parking lot, Fairfield	D(52)	10:40 a.m. - 11:00 a.m.	<b>72</b>
ST-35	Peña Adobe Park, Vacaville	C(67)	10:40 a.m. - 11:00 a.m.	<b>69</b>
ST-36	Pool area of Vacaville Apt. Complex, Vacaville	B(67)	11:10 a.m. - 11:30 a.m.	58
ST-37	Adjacent to 270 Butcher Road, Vacaville	B(67)	11:30 a.m. - 11:50 a.m.	<b>72</b>
ST-38	Pre-school play area at Crossroads Church, Vacaville	C(67)	11:50 a.m. - 12:10 p.m.	62



Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-39	Near Fair oaks Drive Condo, Vacaville	Calibration Point	11:20 a.m. - 11:40 a.m.	65
ST-40	Parking lot of Alamo Inn, Vacaville	Calibration Point	11:50 a.m. - 12:10 p.m.	76

Notes: ST = Short-term; WB = Westbound

**BOLD** font indicates noise levels approaching or exceeding NAC.

Source: Caltrans, 2014m

#### *Segment 5 – Alamo Drive to Allison Drive (East Segment)*

Segment 5 of the noise study area is located in the City of Vacaville, from Alamo Drive to Allison Drive. This noise study segment contains Activity Category B land uses (residences) and Activity Category C land uses (Willows Park). There is also some undeveloped land in this segment. As shown in **Table 2.2-28**, existing worst-hour noise levels at the short-term measurement locations range from 59 to 72 dBA. Several 8- to 14-foot-high noise barriers shield some of the sensitive receptors within this segment. However, some residential areas (ST-43, ST-45, ST-47, ST-47, and ST-49) approach or exceed the NAC.

**Table 2.2-28 Summary of Existing Noise Measurements in Segment 5 of Noise Study Area**

Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-41	Willows Park, Ogden Way, Vacaville	C(67)	10:10 a.m. - 10:30 a.m.	62
ST-42	Rear yard of 620 Piedmont Court, Vacaville	B(67)	11:10 a.m. - 11:30 a.m.	61
ST-43	Front yard of 112 Oak Street, Vacaville	B(67)	10:00 a.m. - 10:20 a.m.	66
ST-44	Front yard of 116 Birch Street, Vacaville	B(67)	10:30 a.m. - 10:50 a.m.	63
ST-45	Adjacent to 191, 201 Bella Vista Road, Vacaville	D(52)	11:30 a.m. - 11:50 a.m.	72
ST-46	Front yard of 90 Birch Street, Vacaville	B(67)	11:00 a.m. - 11:20 a.m.	63
ST-47	Rear yard eq. of 460 Pecan Street, across from the Park & Ride, Vacaville	B(67)	11:30 a.m. - 11:50 a.m.	<b>68</b>

Receptor ID	Location	Noise Abatement Criteria (NAC) Threshold	Start Time – End Time	Worst Hour Leq[h], dBA
ST-48	Southeast corner of Hampton Inn, near pool area, Vacaville	E(72)	10:00 a.m. - 10:20 a.m.	68
ST-49	Comstock Way, Chaparral Loop, Vacaville	B(67)	10:30 a.m. - 10:50 a.m.	<b>67</b>
ST-50	End of Valley Drive, near Chaparral Loop, Vacaville	B(67)	11:00 a.m. - 11:20 a.m.	59
ST-51	Front yard of 49 Sunset Lane (mobile homes), Vacaville	B(67)	10:00 a.m. - 10:20 a.m.	59

Notes: ST = Short-term; WB = Westbound

**BOLD** font indicates noise levels approaching or exceeding NAC.

Source: Caltrans, 2014m

#### *Segment 6 – Allison Drive to Leisure Town Road (East Segment)*

Segment 6 of the noise study area is located in the City of Vacaville, from Allison Drive to Leisure Town Road. No Activity Category B land uses were identified adjacent to the freeway corridor within this noise study segment. This noise study segment contains Activity Category C land uses (Green Tree Golf Club) and Activity Category E land uses (several hotels and motels). As shown in **Table 2.2-29**, existing worst-hour noise levels at short-term measurement locations range from 53 to 63 dBA. No existing noise barriers were identified in segment 6 of the noise study area. No areas within segment 6 of the noise study area approach or exceed the NAC.

**Table 2.2-29 Summary of Existing Noise Measurements in Segment 6 of Noise Study Area**

Receptor ID	Location	Activity Category (NAC)	Start Time – End Time	Worst Hour Leq[h], dBA
ST-52	Pool area of America's Value Inn, Vacaville	E(72)	11:30 a.m. - 11:50 a.m.	63
ST-53	Courtyard Marriott, 120 Nut Tree Parkway, Vacaville	E(72)	10:40 a.m. - 11:00 a.m.	55
ST-54	Tennis courts of Marriott Residence Inn, Vacaville	E(72)	12:30 p.m. - 12:50 p.m.	57
ST-55	Pool area of Motel 6, Orange Drive & Lawrence Drive, Vacaville	E(72)	12:50 p.m. - 1:10 p.m.	53
ST-56	Golf Course near 671 Orange Drive, Vacaville	C(67)	12:30 p.m. - 12:50 p.m.	60

Receptor ID	Location	Activity Category (NAC)	Start Time – End Time	Worst Hour Leq[h], dBA
ST-57	Parking lot of Extended Stay America, Vacaville	E(72)	12:30 p.m. - 12:50 p.m.	59
ST-58	Kaiser Permanente, southeast corner of nearest building, Vacaville	C(67)	12:30 p.m. - 12:50 p.m.	57

Notes: ST = Short-term; WB = Westbound

**BOLD** font indicates noise levels approaching or exceeding NAC.

Source: Caltrans, 2014m

## 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, Type II, or Type III 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-80, 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 G. Tables 2.2-30 through Table 2.2-35** present the existing and future modeled noise levels for these land uses (receptors). Land uses 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. Traffic noise impacts are identified when noise levels are predicted to approach or exceed the NAC.

Noise levels within the noise study area would slightly increase when compared with existing conditions. Predicted noise level increases of 1 to 2 dBA are expected under the 2040 Build conditions. These increases are not considered substantial (defined as 12 dBA or more increase).

With the exception of Segment 6, 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 (see **Mitigation Measure NOI -A**).

*Segment 1 – Red Top Road to Chadbourne Road (West Segment)*

Under the 2040 No-Build and 2040 Build conditions, noise levels within Segment 1 of the noise study area would generally remain the same when compared with existing conditions. Slight, one-decibel increases/decreases are not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at the Fairfield Linear Park Trail (ST-1), Scandia Family Fun Center (R-1c), and one residence located north of I-80 near the Fairfield Linear Park Trail (R-1d). Noise abatement in the form of new sound walls (SW1 and SW2) was considered for impacted receptors.

**Table 2.2-30 Modeled Noise Levels – Segment 1 of Noise Study Area**

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-1	70	70	70	0	0	C(67)	A/E
R-1a	66	67	66	1	0	E(72)	None
R-1b	56	56	56	0	0	E(72)	None
R-1c	76	76	76	0	0	C(67)	A/E
R-1d	70	71	70	1	0	B(67)	A/E
R-2a	68	68	68	0	0	F	None
R-2b	64	64	64	0	0	F	None
R-2c	62	63	63	1	1	B(67)	None
R-2d	62	62	62	0	0	F	None
R-2e	67	68	68	1	1	E(72)	None

Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
2. Modeled receptor locations (R-#)

Source: Caltrans, 2014m

*Segment 2 – Chadbourne Road to Air Base Parkway (West Segment)*

Under the 2040 No-Build and 2040 Build conditions, noise levels within Segment 2 of the noise study area would generally remain the same when compared with existing conditions. Slight, one-decibel increases/decreases are not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at the Fairfield Linear Park Trail (ST-2, R-4e, R-6a, R-6b, R-6c), residences along Loland Lane (R-4c and R-4d), first row residences located south of Travis Boulevard (ST-6, R-6d, R-6e, R-6f, R-6h, R-6j, and

R-6k), residences located south of Air Base Parkway (ST-7, R-7d, R-7e, R-7g, R-7h, R-7j, R-7l, R-12a-e, R-8a, R-8c, R-8e, R-10c, R-11a-d, and R-11f), and at Harvest Valley School (R-11g). Many of these land uses are shielded by existing 6- to 12-foot-high walls (Barriers 1, 2, 4, and 5). Noise abatement in the form of new sound walls (SW3, SW4, SW5, and SW6) and height increases for the existing noise barriers was considered for impacted receptors.

**Table 2.2-31 Modeled Noise Levels – Segment 2 of Noise Study Area**

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-2	71	71	71	0	0	C(67)	A/E
ST-3	57	58	58	1	1	B(67)	None
R-3a	59	60	60	1	1	B(67)	None
R-3b	62	62	62	0	0	B(67)	None
ST-4	60	61	61	1	1	B(67)	None
R-4a	60	60	60	0	0	B(67)	None
R-4b	65	65	65	0	0	C(67)	None
R-4c	68	69	69	1	1	B(67)	A/E
R-4d	69	69	69	0	0	B(67)	A/E
R-4e	78	79	79	1	1	C(67)	A/E
ST-5	59	60	60	1	1	B(67)	None
R-5a	64	65	65	1	1	B(67)	None
R-5b	60	61	61	1	1	B(67)	None
R-5c	61	61	61	0	0	B(67)	None
R-5d	60	61	61	1	1	B(67)	None
R-5e	66	66	66	0	0	E(72)	None
R-5f	62	63	63	1	1	B(67)	None
ST-6	66	66	66	0	0	B(67)	A/E
R-6a	70	71	71	1	1	C(67)	A/E
R-6b	69	70	70	1	1	C(67)	A/E
R-6c	69	69	69	0	0	C(67)	A/E
R-6d	66	66	66	0	0	B(67)	A/E
R-6e	68	69	68	1	0	B(67)	A/E
R-6f	71	72	72	1	1	B(67)	A/E
R-6g	62	63	63	1	1	B(67)	None
R-6h	72	72	72	0	0	B(67)	A/E

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
R-6i	63	64	64	1	1	B(67)	None
R-6j	72	72	72	0	0	B(67)	A/E
R-6k	66	67	66	1	0	B(67)	A/E
R-6l	64	65	65	1	1	B(67)	None
ST-7	65	66	66	1	1	B(67)	A/E
R-7a	63	64	64	1	1	B(67)	None
R-7b	60	61	61	1	1	B(67)	None
R-7c	59	60	60	1	1	B(67)	None
R-7d	66	67	67	1	1	B(67)	A/E
R-7e	67	67	67	0	0	B(67)	A/E
R-7f	58	58	58	0	0	B(67)	None
R-7g	67	67	67	0	0	B(67)	A/E
R-7h	67	68	68	1	1	B(67)	A/E
R-7i	59	59	59	0	0	B(67)	None
R-7j	68	68	68	0	0	B(67)	A/E
R-7k	59	59	59	0	0	B(67)	None
R-7l	68	69	69	1	1	B(67)	A/E
R-7m	61	62	62	1	1	B(67)	None
ST-8	64	65	65	1	1	B(67)	None
R-8a	67	68	68	1	1	B(67)	A/E
R-8b	60	60	60	0	0	B(67)	None
R-8c	66	66	66	0	0	B(67)	A/E
R-8d	58	59	59	1	1	B(67)	None
R-8e	65	66	66	1	1	B(67)	A/E
ST-9	57	58	58	1	1	B(67)	None
R-9a	62	63	63	1	1	B(67)	None
ST-10	58	59	59	1	1	B(67)	None
R-10a	62	63	63	1	1	B(67)	None
R-10b	59	60	60	1	1	B(67)	None
R-10c	67	67	67	0	0	B(67)	A/E
ST-11	61	62	62	1	1	B(67)	None
R-11a	70	71	71	1	1	B(67)	A/E

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
R-11b	65	66	66	1	1	B(67)	A/E
R-11c	70	71	71	1	1	B(67)	A/E
R-11d	69	70	70	1	1	B(67)	A/E
R-11e	62	63	63	1	1	B(67)	None
R-11f	68	68	68	0	0	B(67)	A/E
R-11g	70	71	71	1	1	C(67)	A/E
R-11h	64	65	64	1	0	F	None
R-11i	62	63	63	1	1	F	None
ST-12	65	65	65	0	0	B(67)	None
R-12a	69	70	70	1	1	B(67)	A/E
R-12b	65	66	66	1	1	B(67)	A/E
R-12c	73	73	73	0	0	B(67)	A/E
R-12d	71	71	71	0	0	B(67)	A/E
R-12e	67	68	68	1	1	B(67)	A/E

## Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
2. Modeled receptor locations (R-#)

Source: Caltrans, 2014m

*Segment 3 – Air Base Parkway to Manuel Campos Parkway (East Segment)*

Under the 2040 No-Build and 2040 Build conditions, noise levels within Segment 3 of the noise study area would generally remain the same when compared with existing conditions. Slight, one- to 2-decibel increases/decreases are not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at the residences located along Montclair Way (ST-20 and ST-22). Impacted residences are shielded by an existing 8- to 9-foot-high wall (Barrier 7). Noise abatement in the form of height increases for the existing noise barrier was considered for impacted receptors.

**Table 2.2-32 Modeled Noise Levels – Segment 3 of Noise Study Area**

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-13	56	56	57	0	1	B(67)	None
ST-14	63	63	64	0	1	B(67)	None
ST-15	58	59	59	1	1	B(67)	None
ST-16	63	63	64	0	1	B(67)	None
ST-17	63	63	64	0	1	B(67)	None
ST-18	60	61	62	0	2	B(67)	None
ST-19	53	54	55	0	2	B(67)	None
ST-20	67	68	68	1	1	B(67)	A/E
ST-21	61	61	62	0	1	B(67)	None
ST-22	67	67	68	0	1	B(67)	A/E
ST-23	55	55	56	0	1	B(67)	None
R-23a	56	56	57	0	1	E(72)	None
ST-24	57	58	58	1	1	B(67)	None
ST-25	62	63	63	1	1	B(67)	None
ST-26	59	60	61	1	2	B(67)	None
R-26a	59	59	60	0	1	B(67)	None
ST-27	60	60	61	0	1	B(67)	None

Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
2. Modeled receptor locations (R-#)

Source: Caltrans, 2014m

*Segment 4 – Manuel Campos Parkway to Alamo Drive (East Segment)*

Under the 2040 No-Build and 2040 Build conditions, noise levels within Segment 4 of the noise study area would generally remain the same when compared with existing conditions. Slight, one-decibel increases/decreases are not considered substantial.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at the Paradise Valley Golf Course (R-32a) and at rural residences along Blue Mountain Drive (R-33a), Cherry Glen Road (R-34b), Butcher Road (ST-37 and R-37b), and further west along Butcher Road Trail (R-37a). Noise levels are also predicted to approach or exceed the NAC at the Peña Adobe Park (ST-35). The modeled receptor along Butcher R-32a is currently shielded by a large berm. Noise abatement in the form of new sound walls (SW7, SW8, SW9, and SW10) was considered for impacted receptors.



New Life Church (ST-34) is a Category D land use located in Segment 4 of the noise study area. Exterior 2040 Build noise levels are predicted to be 72 dBA. However, there are no exterior land uses at this location. 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 the NAC of 52 dBA. No noise abatement was considered for this receptor.

**Table 2.2-33 Modeled Noise Levels – Segment 4 of Noise Study Area**

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-28	51	51	52	0	1	B(67)	None
ST-29	54	54	54	0	0	B(67)	None
ST-30	60	60	61	0	1	B(67)	None
ST-31	58	58	59	0	1	C(67)	None
ST-32	58	59	59	1	1	B(67)	None
R-32a	66	66	67	0	1	C(67)	A/E
ST-33	61	61	62	0	1	B(67)	None
R-33a	72	72	72	0	0	B(67)	A/E
ST-34	72	72	72	0	0	D(52)	None
R-34a	63	63	64	0	1	B(67)	None
R-34b	65	65	66	0	1	B(67)	A/E
ST-35	69	70	70	1	1	C(67)	A/E
R-35a	66	66	66	0	0	E(72)	None
ST-36	58	58	58	0	0	B(67)	None
ST-37	72	73	73	1	1	B(67)	A/E
R-37a	78	78	78	0	0	C(67)	A/E
R-37b	69	70	70	1	1	B(67)	A/E
ST-38	62	62	63	0	1	C(67)	None
ST-39	65	65	66	0	1	Cal Point	None
R-39a	64	65	65	1	1	B(67)	None
R-39b	68	69	69	1	1	D(52)	None
ST-40	75	76	76	1	1	Cal Point	None

Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
2. Modeled receptor locations (R-#)

Source: Caltrans, 2014m

*Segment 5 – Alamo Drive to Allison Drive (East Segment)*

Under the 2040 No-Build and 2040 Build conditions, noise levels within Segment 5 of the noise study area would generally remain the same when compared with existing conditions. The receptors would experience noise level increases of 1 to 2 dBA. These increases are not considered substantial, as they are still below the 12 dBA threshold.

Under the 2040 Build conditions, noise levels are predicted to approach or exceed the NAC at the residences along Oak Street (ST-43), along the on-ramp from Davis Street to westbound I-80 (ST-47), and at the residences located in the Sunset Circle Mobile Homes complex (R-51a, R-51b, and R-51c).

The residences on Oak Street (ST-43) are shielded by an existing 14-foot high wall (Barrier 11). Residences adjacent to the Davis Street on ramp are not shielded from the highway and adjacent Park and Ride, which acts as a secondary noise source. Noise abatement in the form of a new sound wall (SW12) was considered for impacted receptors. Wall height increases were assessed for existing Barrier 11 to abate noise impacts at residences along Oak Street; however, increasing the height of Barrier 11 would not be considered feasible because only a maximum of 2 dB of additional attenuation can be achieved with a 16-foot barrier.

The Chaparral Loop (ST-49) is currently being developed with residential uses as part of the Ivywood Project. Construction of noise walls for this development was taking place during the noise monitoring period. Development of the Ivywood Project would be required to meet local noise regulations and, as such, is not assessed further in this document.

There is a church under construction at 201 Bella Vista Road (ST-45). 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 the NAC of 52 dBA. No noise abatement was considered for this receptor.

**Table 2.2-34 Modeled Noise Levels – Segment 5 of Noise Study Area**

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
R-40a	69	69	70	0	1	E(72)	None
ST-41	62	63	63	1	1	C(67)	None
ST-42	61	62	62	1	1	B(67)	None
ST-43	66	67	67	1	1	B(67)	A/E
ST-44	63	64	65	1	2	B(67)	None
R-44a	63	64	64	1	1	B(67)	None
ST-45	72	73	73	1	1	D(52)	None

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No- Build	2040 Build	2040 No- Build	2040 Build		
ST-46	63	64	64	1	1	B(67)	None
R-46a	63	64	65	1	2	B(67)	None
ST-47	68	69	69	1	1	B(67)	A/E
ST-48	68	69	69	1	1	E(72)	None
ST-49	67	68	68	1	1	B(67)	A/E
ST-50	59	60	60	1	1	B(67)	None
ST-51	59	60	60	1	1	B(67)	None
R-51a	65	66	67	1	2	B(67)	A/E
R-51b	74	75	76	1	2	B(67)	A/E
R-51c	65	65	66	0	1	B(67)	A/E

Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
2. Modeled receptor locations (R-#)

Source: Caltrans, 2014m

#### *Segment 6 – Allison Drive to Leisure Town Road (East Segment)*

Under the 2040 No-Build and 2040 Build conditions, noise levels within Segment 6 of the noise study area would generally remain the same when compared with existing conditions. Slight, one- to 2-decibel increases/decreases are not considered substantial.

Under the 2040 Build conditions, noise levels are not predicted to approach or exceed the NAC. Noise abatement was not considered within Segment 6 of the noise study area.

**Table 2.2-35 Modeled Noise Levels – Segment 6 of Noise Study Area**

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No- Build	2040 Build	2040 No- Build	2040 Build		
ST-52	63	65	65	2	2	E(72)	None
R-52a	62	63	63	1	1	E(72)	None
ST-53	55	56	56	1	1	E(72)	None
ST-54	57	59	59	2	2	E(72)	None
ST-55	53	54	54	1	1	E(72)	None
ST-56	60	62	62	2	2	C(67)	None
ST-57	59	60	61	1	2	E(72)	None

Receptor ID	Worst-Hour Noise Levels, Leq[h] dBA			Noise Increase Over Existing		Activity Category (NAC)	Impact <sup>1</sup>
	Existing	2040 No-Build	2040 Build	2040 No-Build	2040 Build		
ST-58	57	59	59	2	2	C(67)	None

Notes:

1. Impact Type: S = Substantial Increase (12 dBA or more), A/E = Approach or Exceed NAC.
2. Modeled receptor locations (R-#)

Source: Caltrans, 2014m

### Temporary Construction Noise

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.

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 Activity Category B land uses (residences) located adjacent to I-80 are shielded by existing noise barriers typically ranging from 8 to 16 feet in height. These existing noise barriers provide a minimum 5 to 10 dBA reduction in construction noise levels for the land uses on the opposite side of the barrier.

**Table 2.2-36** 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 2.2-36 Construction Equipment Noise Levels at 100 feet**

Construction Phase	Maximum Noise Level (Lmax, dBA)	Average Hourly Noise Levels (Leq[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, 2014m

### **West Segment – Fundable First Phase**

Segments 1 and 2 of the noise study area are located within the West Segment. Refer to the discussions above for a summary of the anticipated noise increases with the West Segment.

#### **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-80, 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/mitigation 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, 2014e).

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 benefitted receptor. A benefitted 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 21 potential noise barriers were evaluated for feasibility where the NAC would be approached or exceeded (see **Appendix G**). Ten of the 21 barriers were found to be both acoustically feasible and achieve the Caltrans noise reduction design goal (minimum 7 dBA reduction for at least one receptor). The total reasonable allowance for each feasible barrier that met the Caltrans noise reduction design goal ranged from \$55,000 to \$1,980,000 depending on the number of benefitted receptors.

**Table 2.2-37** provides a summary of the noise barriers that were determined to be acoustically feasible and the corresponding reasonable allowance. Proposed noise barriers are depicted in **Appendix G**.

**Mitigation Measure NOI -A:** Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of the following noise barriers:

- Barrier SW11, along the north side of Davis Street/Hickory Lane on-ramp to westbound I-80, with a respective length and height of 280 feet and 10 feet. Calculations based on preliminary design data show that the barrier will reduce noise levels by 7 dBA for 5 residences at a cost of \$136,100.
- Barrier SW12a, along the eastbound I-80 edge of shoulder, in front of the Sunset Circle Mobile Homes Complex, with a respective length and height of 1,960 feet and 14 feet. Calculations based on preliminary design data show that the barrier will reduce noise levels by 5 to 10 dBA for 28 residences at a cost of \$1,194,900.

If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision on noise abatement will be made upon completion of the project design and the public involvement processes.

**Table 2.2-37 Summary of Noise Barrier Analysis**

Sound Wall ID	Barrier Height (feet)	Noise Reduction (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance	Estimated Construction Cost	Preliminarily Recommended
<b>Segment 1 – Red Top Road to Chadbourne Road (West Segment)</b>						
SW1	8*	8	1	\$55,000	\$380,900	No
	10*	9	1	\$55,000	\$438,200	No
	12*	10	1	\$55,000	\$495,500	No
	14*	10	1	\$55,000	\$552,800	No
	16*	11	1	\$55,000	\$606,200	No
SW2	12*	5 to 7	2	\$110,000	\$1,447,600	No
	14*	6 to 8	2	\$110,000	\$1,615,100	No
	16*	7 to 9	2	\$110,000	\$1,771,200	No
<b>Segment 2 – Chadbourne Road to Air Base Parkway (West Segment)</b>						
SW3	8	6 to 9	2	\$110,000	\$2,245,200	No
	10	8 to 10	2	\$110,000	\$2,583,300	No
	12	5 to 13	6	\$330,000	\$2,921,400	No
	14	5 to 14	9	\$495,000	\$3,259,500	No
	16*	5 to 14	9	\$495,000	\$3,574,600	No

Sound Wall ID	Barrier Height (feet)	Noise Reduction (dBA)	Number of Benefited Receptors	Total Reasonable Monetary Allowance	Estimated Construction Cost	Preliminarily Recommended
SW5	16*	7	7	\$385,000	\$468,700	No
<b>Segment 4 – Manuel Campos Parkway to Alamo Drive (East Segment)</b>						
SW8	14*	8	2	\$110,000	\$1,024,300	No
	16*	8	2	\$110,000	\$1,123,300	No
SW9	12*	7	2	\$110,000	\$1,349,300	No
	14*	8	2	\$110,000	\$1,505,500	No
	16*	8	2	\$110,000	\$1,651,000	No
SW10	8*	6 to 7	7	\$385,000	\$2,820,000	No
	10*	7 to 8	7	\$385,000	\$3,244,600	No
	12*	5 to 11	9	\$495,000	\$3,669,300	No
	14*	5 to 13	9	\$495,000	\$4,093,900	No
	16*	5 to 14	9	\$495,000	\$4,489,700	No
<b>Segment 5 – Alamo Drive to Allison Drive (East Segment)</b>						
SW11	10*	7	5	\$275,000	\$136,100	Yes
	12*	8	5	\$275,000	\$153,900	Yes
	14*	8	5	\$275,000	\$171,700	Yes
	16*	8	5	\$275,000	\$188,200	Yes
SW12, Option a	12*	6 to 9	19	\$1,045,000	\$1,070,900	No
	14*	5 to 10	28	\$1,540,000	\$1,194,900	Yes
	16*	5 to 11	36	\$1,980,000	\$1,310,300	Yes
SW12, Option b	12*	7 to 9	28	\$1,540,000	\$1,638,500	No
	14*	8 to 10	28	\$1,540,000	\$1,800,300	No
	16*	5 to 11	36	\$1,980,000	\$1,952,300	Yes

Note: \*Barrier is calculated to break line-of-sight between truck stacks and receptors.  
Source: Caltrans, 2014m

### Barrier SW11

Barrier SW11 would be located along the north side of Davis Street/Hickory Lane on-ramp to westbound I-80, between the on-ramp and the rear yards of the residences located on the southeast corner of Boyd Street and Pecan Street, in Vacaville.<sup>10</sup> This barrier would be approximately 280 feet in length.

<sup>10</sup> Barrier SW11 would not be a continuation of the proposed Replacement Barrier 11, located along the edge of shoulder of west-bound I-80. A continuous wall is not proposed because the residences along Boyd Street are situated behind existing structures, and would not benefit from an extended sound wall in this location.



This wall would feasibly abate traffic noise at the five residences closest to I-80, and would meet the 7 dB noise reduction goal at a minimum height of 10 feet. Barrier SW11 would also break the line-of-sight between truck stacks and receptors at a height of 10 feet. The construction cost of a 10 to 16 foot-high Barrier SW11 would range from \$136,100 to \$188,200, which is less than the reasonable cost allowance of \$275,000. Barrier SW11, at 10 feet, is therefore recommended for incorporation into the Build Alternative.

#### *Barrier SW12*

Barrier SW12 would be located along the eastbound I-80 edge of shoulder, and would shield the residences in the Sunset Circle Mobile Homes Complex located approximately 200 feet south of the freeway. Two options were analyzed for Barrier SW12; one starting just east of Ulatis Creek (SW12a) and one starting just west of Ulatis Creek (SW12b). Barrier SW12b would require a portion of the wall to be built on the I-80 bridge structure that crosses the creek. Both Barrier SW12 options would feasibly abate traffic noise at these residences and would meet the 7 dB noise reduction goal at a minimum height of 12 feet. Both options of Barrier SW12 break the line-of-sight between truck stacks and receptors at a height of 12 feet. The reasonableness allowance calculated for barrier heights of 12 to 16 feet for SW12a ranged from \$1,045,000 to \$1,980,000. The reasonableness allowance calculated for barrier heights of 12 to 16 feet for SW12b ranged from \$1,540,000 to \$1,980,000.

Barrier SW12 Option A (14 - 16 feet high wall) and Barrier SW12 Option B (16 feet high wall) would be within the calculated reasonable cost allowance. While both are feasible, Barrier SW12a has a substantially lower estimated construction cost compared to Barrier SW12b, while providing the same noise abatement benefits. The longer wall (Barrier SW12b) adds significant cost to cross the Ulatis Creek Bridge and construct the associated retaining walls, yet provides no additional benefits to the associated receptors based on comparing the 16 foot wall height to that of option 12a. Barrier SW12a, at 14 feet, is therefore recommended for incorporation into the Build Alternative.

### **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 outside of the typical daytime hours of 7:00 a.m. to 7:00 p.m., will require contractor(s) to 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.

### **West Segment – Fundable First Phase**

Segments 1 and 2 of the noise study area are located within the West Segment. Refer to the **Table 2.2-37** for a summary of the acoustically feasible noise abatement options applicable to the West Segment (Barriers SW1, SW2, SW3, and SW5).

The estimated construction costs for all the potential barriers within the West Segment of the Build Alternative were higher than the monetary allowances. Therefore, none of the evaluated barriers within the West Segment were considered to be reasonable from a cost perspective, and are not anticipated to be incorporated into the Build Alternative.

### **Summary**

**Mitigation Measure NOI -A:** Based on the studies completed to date, Caltrans intends to incorporate noise abatement in the form of the following noise barriers:

- Barrier SW11, along the north side of Davis Street/Hickory Lane on-ramp to westbound I-80, with a respective length and height of 280 feet and 10 feet. Calculations based on preliminary design data show that the barrier will reduce noise levels by 7 dBA for 5 residences at a cost of \$136,100.
- Barrier SW12a, along the eastbound I-80 edge of shoulder, in front of the Sunset Circle Mobile Homes Complex, with a respective length and height of 1,960 feet and 14 feet. Calculations based on preliminary design data show that the barrier will reduce noise levels by 5 to 10 dBA for 28 residences at a cost of \$1,194,900.

If during final design conditions have substantially changed, noise abatement may not be necessary. The final decision on noise abatement will be made upon completion of the project design and the public involvement processes.

### CEQA Noise Analysis

Traffic noise impacts may be considered significant under CEQA if the project is predicted to result in a substantial increase in traffic noise. A significant noise increase is defined as an increase in 12 dBA or more from existing conditions to design-year conditions.<sup>11</sup> Results from the noise modeling assessment indicate that noise levels within the noise study area would slightly increase when compared with existing conditions. Predicted noise level increases of 1 to 2 dBA are expected under the 2040 Build conditions. These increases are not considered substantial (defined as 12 dBA or more increase). With the exception of Segment 6, 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 (see **Mitigation Measure NOI -A**).

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<sup>11</sup> The 2011 update to Caltrans' *Traffic Noise Analysis Protocol* notes that the 12 dB definition should not necessarily be used for all projects, although it continues to be appropriate for some projects. While the Noise Study Report for this project (2014m) used the 12 dB definition, it should be noted that the noise increases resulting from the Build Alternative (described in **Tables 2.2-30** through **2.2-35** in *Environmental Consequences*) are between 1 and 2 dB, well below any reasonable definition of substantial noise increase.

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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 **Section 2.3.5, Threatened and Endangered Species**. Wetlands and other waters are also discussed below in **Section 2.3.2, Wetlands and Other Waters**.

#### AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the project (Caltrans, 2014k).

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 potential effects that may occur outside of the direct physical footprint of the Build Alternative. **Appendix H** illustrates the limits of the BSA for the Build Alternative.

The BSA does not extend far beyond the project limits, thus the majority of the land within the BSA is disturbed or developed. The BSA totals 778.13 acres, of which the majority is disturbed or developed. In general, the BSA runs within approximately 20 miles of Caltrans state right-of-way associated with the I-80 corridor, from just west of Red Top Road to east of the intersection of I-80 and I-505 (post mile 10.2 to 30.4). Formal studies of biological resources within the BSA were conducted on the following listed survey dates:

- Botanical surveys conducted between September 2011, March 2012, May 2012, March 2013, May 2013, and August 2013, 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 botanical surveys.
- Multiple field investigations were conducted from April to June and August to September in 2011 to delineate potential waters of the U.S., including wetlands and water features.
- Large branchiopod surveys were conducted from March 2012 to April 2013.

- Bat assessments were conducted in August 2011 at each bridge and crossing within the BSA.
- A habitat assessment for anadromous fish was conducted in 2012.
- A protocol-level site assessment for the California tiger salamander (*Ambystoma californiense*) was conducted in August 2013.
- Protocol-level California red-legged frog (*Rana draytonii*) surveys were conducted in August 2013.
- Reconnaissance level surveys for the Swainson's hawk (*Buteo swainsoni*) were conducted in April 2012.
- Multiple tree surveys were conducted in September 2011 and between October and December 2011.

Subsequent to the completion of biological field surveys conducted in 2011 and 2012, the project limits were extended 1 mile in each direction to accommodate changes to entrance and exit signage, and to facilitate utility connections. Each survey was reviewed upon changes to the project limits, and additional surveys were performed in 2013, if necessary. All acreages (e.g., impact areas and land cover types) discussed in this section reflect the current project limits.

There are 14 habitat types in the BSA. Of the various habitats present within the BSA, oak woodlands, riparian woodlands, mixed oak woodlands, and wetlands are considered sensitive habitat types. Impacts to four types of aquatic and wetland habitats are discussed in **Section 2.3.2, Wetlands and Other Waters**, which discusses jurisdictional wetlands and other waters within the BSA.

**Table 2.3-1** lists the remaining ten land use communities present within the BSA. **Appendix H** illustrates the distribution of the natural communities within the BSA. Principal characteristics and general locations of these communities as they exist within the BSA are described below. The vegetation types identified within the BSA support a variety of wildlife species, including mammals, birds, amphibians, reptiles, and fishes. Marsh habitats can provide habitat for fish nurseries, amphibians, aquatic reptiles, wading birds, waterfowl, and songbirds. 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 Land Cover Types within the BSA**

Land Cover Type	Total Area within BSA (acres)
<b>West Segment</b>	
Non-Native Annual Grassland	39.72
Landscaped	25.18
Ruderal	22.47
Barren	14.79
Mixed Oak Woodland	0.89
Riparian Woodland	0.26
Eucalyptus Grove	4.44
Row Crops	0.58
Coyote Brush Scrub	0.22
Developed	238.45
<b>West Segment Total</b>	<b>347.00</b>
<b>East Segment</b>	
Non-Native Annual Grassland	68.33
Landscaped	39.05
Ruderal	39.64
Barren	2.32
Mixed Oak Woodland	14.90
Riparian Woodland	3.31
Eucalyptus Grove	5.02
Row Crops	3.13
Coyote Brush Scrub	2.84
Developed	239.75
<b>East Segment Total</b>	<b>418.29</b>
<b>Build Alternative</b>	
Non-Native Annual Grassland	108.05
Landscaped	64.23
Ruderal	62.11
Barren	17.11
Mixed Oak Woodland	15.79
Riparian Woodland	3.57
Eucalyptus Grove	9.46
Row Crops	3.71
Coyote Brush Scrub	3.06
Developed	478.20
<b>Total Build Alternative</b>	<b>765.29</b>

Source: Caltrans, 2014k

## Non-Native Annual Grassland

### *Vegetation*

Non-native grassland occurs in small patches throughout the BSA and is the dominant vegetation type within the BSA abundant habitat types. Non-native grassland is generally dominated by exotic annual grasses and forbs including wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Festuca perennis*), yellow star-thistle (*Centaurea solstitialis*), hare barley (*Hordeum murinum* ssp. *leporinum*), medusa-head grass (*Elymus caput-medusae*), mustards (*Brassica* spp.), and filarees (*Erodium* spp.). Occasional native species are also present, but less dominant than non-native species. These include the blue wildrye (*Elymus glaucus*) and California poppy (*Eschscholzia californica*).

### *Wildlife in Grassland Habitat*

Grasslands lack the structural diversity necessary to support a high diversity of wildlife species, but are used as foraging, burrowing, and nesting locations by moderate numbers of wildlife species. Annual grassland habitat in the BSA is used by reptiles and amphibians such as the western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), and western toad (*Anaxyrus boreas*) that feed on invertebrates found within and beneath debris in the vegetation. Insect and seed eating birds, including the western scrub-jay (*Aphelocoma californica*), barn swallow (*Hirundo rustica*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), golden-crowned sparrow (*Zonotrichia atricapilla*), and white-crowned sparrow (*Zonotrichia leucophrys*), also use this habitat for foraging, and the scattered trees provide nesting habitat. A number of mammal species, including the deer mouse (*Peromyscus maniculatus*), Botta's pocket gopher (*Thomomys bottae*), and black-tailed hare (*Lepus californicus*), forage and nest within these grasslands. These mammals also attract predatory wildlife including the gopher snake (*Pituophis catenifer*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and gray fox (*Urocyon cinereoargenteus*).

## Landscaped

### *Vegetation*

Landscaped areas occur throughout the BSA in close association with existing development. These areas have been impacted by grading, mowing, filling, and urban uses. Landscaped areas include irrigated lawns as well as ornamental trees and shrubs. In some cases, landscaping includes planted native trees such as the California sycamore (*Platanus racemosa*), Fremont's cottonwood (*Populus fremontii*), bishop pine (*Pinus muricata*), and Monterey cypress (*Hesperocyparis macrocarpa*).



### *Wildlife in Landscaped Habitat*

The landscaped areas within the BSA are frequently disturbed, and are used only by the most disturbance-tolerant wildlife species. The species that are found here are often introduced, non-natives such as rock pigeons (*Columba livia*), European starlings (*Sturnus vulgaris*), and house sparrows (*Passer domesticus*). Other species occurring within landscaped habitat include mourning doves, Brewer's blackbirds (*Euphagus cyanocephalus*), killdeer (*Charadrius vociferus*), and northern mockingbirds.

## **Ruderal**

### *Vegetation*

Ruderal habitat is generally dominated by non-native species that are able to rapidly colonize and establish on recently disturbed soil. Ruderal habitat occurs in numerous small patches along the roadside in the BSA. Typical dominant vegetation in these areas includes winter vetch (*Vicia villosa*), Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum maritimum*), filarees, prickly sow-thistle (*Sonchus asper*), ripgut brome, wild radish (*Raphanus sativus*), mustards (*Brassica* spp.), bur-clover (*Medicago polymorpha*), and horseweed (*Conyza canadensis*).

### *Wildlife in Ruderal Habitat*

Wildlife species found in ruderal areas are typically those species found in developed habitats and that use adjacent ruderal areas for foraging and moving. Common wildlife species found in ruderal habitats include western fence lizards, killdeer, house finches (*Haemorhous mexicanus*), western meadowlarks (*Sturnella neglecta*), red-winged blackbirds (*Agelaius phoeniceus*), American goldfinches (*Carduelis tristis*), mourning doves, house mice (*Mus musculus*), black-tailed hares, and California ground squirrels (*Spermophilus beecheyi*).

## **Barren**

### *Vegetation*

In the BSA, barren habitat typically occurs along roadsides and in other areas that experience frequent, heavy disturbance. Although these areas are not covered in hardscape (i.e. asphalt or concrete), the soil is either heavily compacted or covered in gravel which prohibits the growth of most plant species. Total plant cover in these areas is less than five percent.

### *Wildlife in Barren Habitat*

Barren habitat provides few resources to wildlife species. Although some species associated with adjacent habitats likely forage on the soil of the barren habitat to some extent, use of this habitat by wildlife is expected to be limited.

## Mixed Oak Woodland

### *Vegetation*

Mixed oak woodland often occurs along riparian corridors within the BSA, but can also occur in upland settings away from stream and creek channels. This habitat is generally co-dominated by valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and interior live oak (*Quercus wislizenii* var. *wislizenii*). Other common native species include elderberry (*Sambucus nigra*), California buckeye, and poison oak (*Toxicodendron diversilobum*). The understory of the mixed oak woodland habitat is generally composed of non-native annual grassland.

### *Wildlife in Mixed Oak Woodland Habitat*

Mixed oak woodland habitat can support diverse animal communities in California. Both valley and coast live oaks in this habitat provide shelter for wildlife in the form of cavities, bark crevices, and complex branching growth, as well as abundant food resources, including nuts and invertebrates. Leaf litter and fallen logs in the mixed oak woodland may provide cover and foraging habitat for California slender salamanders (*Batrachoseps attenuatus*), western fence lizards, and other common reptiles. Common bird species in the mixed oak woodland includes the Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), western scrub-jay, violet-green swallow (*Tachycineta thalassina*), chestnut-backed chickadee (*Poecile rufescens*), bushtit (*Psaltiriparus minimus*), Bewick's wren (*Thryomanes bewickii*), dark-eyed junco (*Junco hyemalis*), house finch, and lesser goldfinch (*Spinus psaltria*). Medium-sized urban-associated mammals such as raccoons (*Procyon lotor*) and striped skunks (*Mephitis mephitis*) are also expected to frequent this habitat type. Several species of bats, including the California myotis (*Myotis californicus*) and western red bat (*Lasiurus blossevillei*), may roost in small numbers in the larger trees within the BSA.

## Riparian Woodland

### *Vegetation*

Riparian woodland occurs along stream and creek channels within the BSA. The riparian woodlands support a relatively diverse assemblage of native trees and shrubs including valley oak, coast live oak, willows (*Salix* spp.), California bay (*Umbellularia californica*), Fremont's cottonwood, Oregon ash (*Fraxinus latifolia*), California buckeye, and elderberry. The understory is composed of a mix of native and non-native grasses, forbs, and woody vines. Common native species include mugwort (*Artemisia douglasiana*), California wild rose (*Rosa californica*), poison oak, and California wild grape (*Vitis californica*). Common non-native species include Himalayan blackberry (*Rubus armeniacus*), as well as a variety of exotic grasses and forbs similar to those observed in non-native grassland.

### *Wildlife in Riparian Woodland Habitat*

Riparian habitats in California generally support exceptionally rich animal communities and contribute a disproportionately high amount to landscape-level species diversity. The oaks, willows, and cottonwoods in the riparian woodlands attract a number of avian species to this habitat. Some of these species are resident year-round, breeding in the riparian habitat in spring and summer and using it for cover and foraging during the non-breeding season. Common bird species nesting and foraging in this habitat include the chestnut-backed chickadee, bushtit, oak titmouse (*Baeolophus inornatus*), downy woodpecker (*Picoides pubescens*), Bewick's wren, spotted towhee (*Pipilo maculatus*), and song sparrow (*Melospiza melodia*). Raptors, such as red-shouldered hawks (*Buteo lineatus*) and Cooper's hawks (*Accipiter cooperii*), may nest within the riparian woodland in the BSA and forage in adjacent habitats year round.

A number of species of reptiles and amphibians occur in the leaf litter, downed tree branches, and fallen logs of this habitat. These include the arboreal salamander (*Aneides lugubris*), western toad, and Sierran chorus frog (*Pseudacris sierra*), western fence lizard, western skink, and southern alligator lizard (*Elgaria multicarinata*). Small mammals such as ornate shrews (*Sorex ornatus*), California voles (*Microtus californicus*), and western grey squirrels (*Sciurus griseus*) and medium-sized mammals such as raccoons, striped skunks, and non-native opossums (*Didelphis virginianus*) are common, urban-adapted species present in the riparian woodland habitat.

### **Eucalyptus Grove**

#### *Vegetation*

Eucalyptus grove habitat occurs in many small patches in the BSA. Eucalyptus trees are non-native and have been planted for a variety of purposes, most commonly as windbreaks. The eucalyptus groves in the BSA are dominated by one or more eucalyptus tree species including blue gum (*Eucalyptus globulus*) and red gum (*Eucalyptus camaldulensis*). The understory is sparsely vegetated and dominated by leaf and bark litter in dense groves, and non-native grassland species where there are larger canopy gaps.

#### *Wildlife in Eucalyptus Grove Habitat*

The eucalyptus grove habitats in the BSA support many common species of amphibians, reptiles, birds, and mammals. Although most of these species are expected to be less common, a few, such as the Anna's hummingbird and the yellow-rumped warbler (*Setophaga coronata*), may be seasonally common in this habitat. In addition, these trees may be used as nesting sites by raptors such as the white-tailed kite (*Elanus leucurus*) and red-shouldered hawk. Bird and mammal species associated with low, dense vegetation are expected to be rare in, or absent from, the eucalyptus grove habitat.

## **Row Crops**

### *Vegetation*

The BSA encroaches upon the edges of agricultural fields located on the westbound side of I-80, near the Cherry Glen Road intersection. Areas mapped as row crops are routinely plowed/disked and support agricultural crops on a seasonal basis. When fallow, these areas support a plant community similar to that described for ruderal habitats above.

### *Wildlife in Row Crops*

The row crop habitat in the BSA provides wildlife habitat similar to that found in the non-native grassland discussed above. The major difference is that the periodic disking<sup>1</sup> associated with the agricultural areas in the BSA disrupts burrows and other refugia for reptiles, rodents, and other small animals. Efficient burrowers such as California ground squirrels are capable of recolonizing these habitats after the disturbance has passed. These colonizations are usually limited to the peripheries of the fields.

## **Coyote Brush Scrub**

### *Vegetation*

Coyote brush scrub habitat typically occurs within non-native grassland and is generally transitional between woodland and grassland habitat types in the BSA. Coyote brush can grow approximately 10 feet tall and has evergreen leaves. This habitat is dominated by coyote brush (*Baccharis pilularis*) with a non-native grasslands understory and scattered poison oak shrubs.

### *Wildlife in Coyote Brush Scrub Habitat*

Coyote brush scrub habitats are typically dry and provide relatively low and homogeneous vegetative structure resulting in low wildlife species diversity. In the BSA, coyote scrub habitat is restricted and surrounded by grassland and developed habitats resulting in the occasional use of this habitat type by wildlife species that occur in the adjacent habitats. Amphibians are usually absent or scarce in coyote brush scrub habitat due to the very dry conditions. Mammals that use the northern coyote brush scrub habitats for foraging and cover include the coyote (*Canis latrans*), bobcat (*Lynx rufus*), and brush rabbit (*Sylvilagus bachmani*), among others. Bird species that nest in coyote brush scrub habitats include the western scrub-jay, California thrasher (*Toxostoma redivivum*), California towhee (*Melospiza crissalis*), spotted towhee, California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), and Anna's hummingbird. Reptiles that occur in these habitats include the gopher snake, southern alligator lizard, and western fence lizard.

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<sup>1</sup> Agricultural technique to laterally displace and invert soil through the use of concave steel disk blades.

## Developed

### *Vegetation*

Developed areas are the predominant land use type within the BSA and include all paved surfaces including roadways, parking lots, and structures.

### *Wildlife in Developed Areas*

Paved roadways in developed areas do not provide high-quality wildlife habitat. However, snakes and lizards may bask on road surfaces, and a wide variety of wildlife cross or move along the road en route to other habitats. Bridges can function as sheltering habitat for an assortment of wildlife species. Crevices found within bridges provide protection from inclement weather as well as from potential predators, and can encourage their use as nesting habitat. Eight of the seventeen bridges/culverts within the BSA were determined to provide suitable day roosting and/or night roosting habitat for bats, including the Yuma myotis (*Myotis yumanensis*) and nesting birds such as cliff swallows (*Petrochelidon pyrrhonota*) and black phoebes (*Sayornis nigricans*).

## Wildlife Corridors

The existing traffic lanes of the I-80 corridor currently present a substantial passage impediment to smaller, less mobile animals and partial passage impediment to larger, more, mobile animals within the BSA. Less mobile animals include reptiles such as the western pond turtle, amphibians such as the California red-legged frog, and rodents. Larger and more mobile animals include birds such as the burrowing owl and Swainson's hawk and mammals such as the American badger. However, there are several creek crossings and underpass structures, in both the West and East Segments, which provide potential pathways for animal passage across I-80. The current condition of existing wildlife corridors (including fish passage for federally listed species) within the BSA is discussed in greater detail under **Section 2.3.4, Animal Species**, and **Section 2.3.5, Threatened and Endangered Species**, as it pertains to specific sensitive and/or special-status animal species.

## 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 2.3-2**, which identifies the temporary and permanent impacts of the Build Alternative to each natural community. Project effects that are considered temporary include the use of areas of habitat as staging areas and temporary construction access areas.

The West Segment boundaries overlap the boundaries of two other projects for which Caltrans also led the environmental compliance efforts; the I-80/I-680/SR-12 Interchange Project Phase 1 initiated in the spring of 2014 and the Truck Scales project completed in

2013. To avoid redundant environmental compliance efforts, wherever the project anticipated an overlap with impact areas identified in the I-80/I-680/SR-12 Interchange project Phase 1 or Truck Scales projects, the following methods were applied:

- Permanent Impacts. I-80 Express Lanes Project impact areas that overlap with the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales permanent impact areas are not counted as I-80 Express Lanes Project impacts.
- Temporary Impacts. I-80 Express Lanes Project impacts that would spatially overlap with the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales temporary impact areas are counted as I-80 Express Lanes project impacts.

Thus, it is noted that **Table 2.3-2** and **Table 2.3-3** (see **Section 2.3.2, Wetlands and Other Waters**) summarize the project's temporary and permanent impacts on habitat/land cover types within the BSA, including those impacts already mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales projects.

**Table 2.3-2** includes isolated calculations for the West Segment and East Segment of the Build Alternative. In total, the Build Alternative would result in permanent impacts to approximately 1.35 acres of mixed oak woodlands, all of which would be affected within the East Segment. Permanent impacts to approximately 0.03 acre of riparian woodland would also occur; 0.01 acre in the West Segment and 0.02 acre in the East Segment.

Compensatory mitigation will be required for impacts of mixed oak woodlands as mitigation for state and federally listed species (see **Section 2.3.5**) and for riparian habitat.

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**.

#### **West Segment –Fundable First Phase**

Construction of the West Segment of the Build Alternative would result in approximately 0.01 acre of direct impacts to riparian woodlands and no direct impacts to mixed oak woodlands within the BSA.

The effects to the remaining habitat types within the BSA of the construction of the West Segment of the Build Alternative are listed in **Table 2.3-2**, and are discussed in greater detail in the subsequent sections of this analysis.

**Table 2.3-2 Impacts to Land Cover Types within the BSA**

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated (acres)	Permanent Impacts – Not Previously Mitigated (acres)
<b>West Segment</b>					
Non-Native Annual Grassland	2.82	0.07	2.89	1.57	0.05
Landscaped	3.39	0.22	3.61	3.39	0.22
Ruderal	2.56	0.12	2.68	2.49	0.10
Barren	2.30	0.07	2.37	1.75	0.02
Mixed Oak Woodland	0.00	0.00	0.00	0.00	0.00
Riparian Woodland	0.00	0.01	0.01	0.00	0.01
Eucalyptus Grove	0.26	0.00	0.26	0.25	0.00
Row Crops	0.00	0.00	0	0.00	0.00
Coyote Brush Scrub	0.03	0.01	0.04	0.03	0.01
Developed	10.90	0.80	11.7	6.21	0.65
<b>West Segment Total</b>	<b>22.58</b>	<b>1.31</b>	<b>23.89</b>	<b>15.69</b>	<b>1.06</b>
<b>East Segment</b>					
Non-Native Annual Grassland	8.46	2.6	11.06	_ <sup>2</sup>	_ <sup>2</sup>
Landscaped	4.41	9.88	14.29	_ <sup>2</sup>	_ <sup>2</sup>
Ruderal	7.42	4.68	12.1	_ <sup>2</sup>	_ <sup>2</sup>
Barren	1.14	0	1.14	_ <sup>2</sup>	_ <sup>2</sup>
Mixed Oak Woodland	0.00	1.35	1.35	_ <sup>2</sup>	_ <sup>2</sup>
Riparian Woodland	0.00	0.02	0.02	_ <sup>2</sup>	_ <sup>2</sup>
Eucalyptus Grove	0.83	0.14	0.97	_ <sup>2</sup>	_ <sup>2</sup>
Row Crops	0.00	0.00	0.00	_ <sup>2</sup>	_ <sup>2</sup>
Coyote Brush Scrub	0.03	0.00	0.03	_ <sup>2</sup>	_ <sup>2</sup>
Developed	4.42	9.16	13.58	_ <sup>2</sup>	_ <sup>2</sup>
<b>East Segment Total</b>	<b>27.66</b>	<b>27.99</b>	<b>55.65</b>	<b>_<sup>2</sup></b>	<b>_<sup>2</sup></b>
<b>Build Alternative</b>					
Non-Native Annual Grassland	11.28	2.67	13.95	10.03	2.65
Landscaped	7.80	10.10	17.9	7.80	10.10
Ruderal	9.98	4.80	14.78	9.92	4.78

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated <sup>1</sup> (acres)	Permanent Impacts – Not Previously Mitigated <sup>1</sup> (acres)
Barren	3.44	0.07	3.51	2.90	0.03
Mixed Oak Woodland	0.00	1.35	1.35	0.00	1.35
Riparian Woodland	0.00	0.03	0.03	0.00	0.03
Eucalyptus Grove	1.09	0.14	1.23	1.09	0.14
Row Crops	0.00	0.00	0	0.00	0.00
Coyote Brush Scrub	0.06	0.01	0.07	0.06	0.01
Developed	15.32	9.96	25.28	10.63	9.81
<b>Total Build Alternative</b>	<b>48.97</b>	<b>29.30</b>	<b>79.54</b>	<b>42.43</b>	<b>28.90</b>

Note<sup>1</sup>: Project impact area less overlapping permanent impact areas mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales projects.

Note<sup>2</sup>: Temporary and permanent impacts not previously mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales project do not overlap with the East Segment.

Source: Caltrans, 2014k

### No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lanes would be repurposed or 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. Adverse effects to riparian woodlands and mixed oak woodlands in areas outside of the BSA would be determined under separate environmental review and environmental permitting from regulatory agencies.

### 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 aquatic and wetland 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**.

**Mitigation Measure BIO-A: Compensatory Mitigation for Oak Woodlands – Replacement.** Compensation for impacts to 1.35 acres of oak woodland habitat will be mitigated at a replacement ratio of 2:1 within the BSA and, if needed, outside the BSA. An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and



density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. If the replacement of oak woodland habitat cannot be implemented within the BSA, or there is not a sufficient area to mitigate oak woodland tree and shrub impacts, as determined by Caltrans, acreage for oak woodland plantings will be acquired within the vicinity of the project.

**Mitigation Measure BIO-B: Compensatory Mitigation for Oak Woodlands – Habitat Mitigation and Monitoring Plan.** Prior to issuance of a grading permit, Caltrans will prepare an Oak Woodland Habitat Mitigation & Monitoring Plan (HMMP) for oak woodland habitat creation. An open space or conservation easement, or other similar instrument, will be recorded on property associated with the mitigation lands to protect the created habitats' plant and wildlife resources in perpetuity. The Oak Woodland HMMP will be prepared by a qualified restoration ecologist and will provide, at a minimum, the following items:

- Habitat impacts summary and proposed habitat mitigation actions
- Goals of the restoration to achieve no net loss
- The location of the mitigation sites and existing site conditions
- Mitigation design including:
  - Proposed site construction schedule
  - Description of existing and proposed soils, hydrology, geomorphology and geotechnical stability
  - Site preparation and grading plan
  - Invasive species eradication plan, if applicable
  - Soil amendments and other site preparation
  - Planting plan (plant procurement/propagation/installation)
  - Maintenance plan
  - Monitoring measures, performance and success criteria
  - Monitoring methods, duration, and schedule
  - Contingency measures and remedial actions
  - Reporting measures

This mitigation will be deemed complete and Caltrans released from further responsibilities when the final success criteria have been met as determined by applicable regulatory/resource agencies.

Avoidance measures would also avoid or minimize impacts to oak woodlands within the BSA (**Measure BIO-1**). **Mitigation Measures BIO-A** and **BIO-B** would reduce effects to Oak Woodlands.

## 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 that may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. See **Section 2.2.2, Water Quality and Storm Water Runoff**, for additional details.

## AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans 2014k). Field investigations were conducted in 2011 and 2013 to preliminarily delineate jurisdictional wetlands and other waters of the U.S., which are regulated by the USACE, and other federal waters of the State regulated by the RWQCB and CDFW. The delineations were conducted in accordance with USACE guidance. **Table 2.3-3** summarizes the potential jurisdictional waters within the BSA by feature type.

The jurisdictions of individual features as discussed in this section have not yet been officially verified by the USACE. The Preliminary Determination of Jurisdictional Waters was sent by Caltrans to the USACE on October 29, 2014 and is included as **Appendix L**. A wetland

verification site visit will be attended by USACE and Caltrans during the next project phase (PS&E) for official verification. If the delineated wetlands are determined to be USACE-jurisdictional, impacts to these wetlands due to project-related activities are likely to require a Section 404 permit issued by the USACE (a Regional or Nationwide General Permit if possible; an Individual Permit only if a General is not possible). However, wetlands determined to be isolated wetlands, and not USACE-jurisdictional, remain potentially State jurisdictional since isolated waters are considered waters of the State.

The vast majority of wetlands and aquatic habitats providing important ecological functions and values within the BSA are considered jurisdictional waters of the U.S. by the USACE, including all perennial drainages. However, some seasonal drainages and wetlands in the BSA may not be considered waters of the U.S. by the USACE because they have no hydrological connection, although this determination ultimately will be made by the USACE during the PS&E phase of the project. **Table 2.3-4** summarizes impacts to wetlands and waters by feature type as they relate to permitting needs, which are described in more detail in *Permitting*.

**Table 2.3-3 Wetlands and Water Features Affected by the Build Alternative**

Aquatic Habitat	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated (acres)	Permanent Impacts – Not Previously Mitigated (acres)
<b>West Segment</b>						
Perennial Wetland	0.51	0.00	0.00	0	0.00	0.00
Seasonal Wetland	1.12	0.00	0.01	0.01	0.00	0.00
Perennial Drainage	0.54	0.00	0.00	0	0.00	0.00
Seasonal Drainage	2.29	0.32	0.00	0.32	0.31	0.00
<b>West Segment Total</b>	<b>4.46</b>	<b>0.32</b>	<b>0.01</b>	<b>0.33</b>	<b>0.31</b>	<b>0.00</b>
<b>East Segment</b>						
Perennial Wetland	1.24	0	0.06	0.06	<sup>2</sup>	<sup>2</sup>
Seasonal Wetland	0.58	0	0.01	0.01	<sup>2</sup>	<sup>2</sup>
Perennial Drainage	3.44	0.38	0.03	0.41	<sup>2</sup>	<sup>2</sup>
Seasonal Drainage	3.12	0.54	0.06	0.6	<sup>2</sup>	<sup>2</sup>
<b>East Segment Total</b>	<b>8.38</b>	<b>0.92</b>	<b>0.16</b>	<b>1.08</b>	<sup>2</sup>	<sup>2</sup>
<b>Build Alternative</b>						
Perennial Wetland	1.75	0.00	0.06	0.06	0.00	0.06
Seasonal Wetland	1.70	0.00	0.02	0.02	0.00	0.02

Aquatic Habitat	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated <sup>1</sup> (acres)	Permanent Impacts – Not Previously Mitigated <sup>1</sup> (acres)
Perennial Drainage	3.98	0.38	0.03	0.41	0.38	0.03
Seasonal Drainage	5.41	0.86	0.06	0.92	0.85	0.06
<b>Total Build Alternative</b>	<b>12.84</b>	<b>1.24</b>	<b>0.17</b>	<b>1.41</b>	<b>1.23</b>	<b>0.17</b>

Note<sup>1</sup>: Project impact area less overlapping permanent impact areas mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales projects.

Note<sup>2</sup>: Temporary and permanent impacts not previously mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales project do not overlap with the East Segment.

Source: Caltrans 2014k

Within the BSA, there are 12.84 acres of aquatic habitats, which includes 1.75 acres of perennial wetlands, 1.70 acres of seasonal wetlands, 3.98 acres of perennial drainages, and 5.41 acres of seasonal drainages. Perennial wetlands occur within the low-flow channel of six drainages as well as two marshes that are outside of these drainages. In addition, 10 perennial drainages occur within the BSA. Seasonal wetlands and seasonal drainages are scattered throughout the BSA. The different types of wetlands and drainages and their locations are described further below.

**Table 2.3-4 Impacts to Wetlands and Water Features by Permit Requirement**

Aquatic Habitat	Temporary Impacts (acres)			Permanent Impacts (acres)		
	Non-jurisdictional	State & Federal <sup>1</sup>	1602 <sup>2</sup>	Non-jurisdictional	State & Federal <sup>1</sup>	1602 <sup>2</sup>
Perennial Wetland	0.00	0.00	0.00	0.00	0.00	0.06
Seasonal Wetland	0.00	0.00	0.00	0.00	0.02	0.00
Perennial Drainage	0.00	0.00	0.38	0.00	0.00	0.03
Seasonal Drainage	0.12	0.74	0.00	0.00	0.06	0.00
<b>Total</b>	<b>0.12</b>	<b>0.74</b>	<b>0.38</b>	<b>0.00</b>	<b>0.08</b>	<b>0.09</b>

Note<sup>1</sup>: Features that are expected to be considered jurisdictional by both the State and the USACE but would not need a 1602 permit. These may require a Section 404 permit from USACE and Section 401 Water Quality Certification from the State. Refer to *Permitting* section for further description of these requirements.

Note<sup>2</sup>: Features that are expected to be considered jurisdictional and require a Section 1602 permit.

Source: Caltrans, 2014k

### Perennial Wetland

Perennial wetland habitat includes areas mapped as perennial wetland, perennial drainage, or perennial marsh. Perennial marsh occurs within the following drainages in the BSA:

- Green Valley Creek

- Dan Wilson Creek
- an unnamed drainage ditch between Holiday Lane and I-80, just west of the intersection with Alvarado Court
- an unnamed drainage ditch between Hillborn Road and I-80
- an unnamed drainage ditch north of the I-80W off-ramp to Hickory Lane
- drainage ditches in the cloverleaf east of the intersection of I-80 and North Texas Street

These areas support perennial or near perennial surface water and are dominated by emergent perennial hydrophytes including cattails (*Typha* spp.), and hardstem bulrush (*Schoenoplectus acutus*). Other common species include giant horsetail (*Equisetum telmateia* ssp. *braunii*), water plantain (*Alisma plantago-aquatica*), and water pepper (*Persicaria hydropiperoides*). In addition, the following two perennial marsh wetlands occur in the BSA:

- between I-80 and Nelson Road, west of the intersection with Lagoon Valley Road
- in the cloverleaf west of the intersection of I-80 and Leisure Town Road

#### *Wildlife in Perennial Wetlands*

Perennial wetlands provide habitat for numerous bird species, including ducks, herons, egrets, and other waterbirds. American coots (*Fulica americana*), pied-billed grebes (*Podilymbus podiceps*), and several species of ducks breed in freshwater wetlands in and around emergent vegetation. Perching bird species that breed in freshwater marshes include the marsh wren (*Cistothorus palustris*), song sparrow, common yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*). Amphibians such as the native Sierran chorus frog and western toad, as well as the non-native American bullfrog (*Lithobates catesbeianus*), are also present in these habitats.

#### **Seasonal Wetland**

##### *Vegetation*

Seasonal wetlands are scattered throughout the BSA. These features are often located in close proximity to existing development and in some cases may be supported by runoff from developed areas. Due to their proximity to development, these wetlands include a mix of both native and non-native plants. Dominant native plants include common spikerush (*Eleocharis macrostachya*), iris leaf rush (*Juncus xiphioides*), balticus rush (*Juncus balticus*), and tall flatsedge (*Cyperus eragrostis*). Dominant, non-native plants include dallisgrass (*Paspalum dilatatum*), Italian ryegrass (*Festuca perennis*), rabbits-foot grass (*Polypogon monspeliensis*), and Bermuda grass (*Cynodon dactylon*). Other commonly observed species include curly dock (*Rumex crispus*), bristly ox-tongue (*Helminthotheca echioides*), birds-foot trefoil (*Lotus corniculatus*), teasel (*Dipsacus fullonum*), and alkali mallow (*Malvella leprosa*).

### *Wildlife in Seasonal Wetlands*

Wildlife species found in seasonal wetlands include the same bird and amphibian species detailed in the ***Wildlife in Perennial Wetlands*** discussion above.

### **Perennial Drainage**

#### *Vegetation*

Perennial drainage habitat in the BSA is generally unvegetated and supports perennial flows in a normal rainfall year. The following areas provide perennial drainage habitat:

- Alamo Creek
- Dan Wilson Creek
- Horse Creek
- Laguna Creek
- Ledge wood Creek
- Pine Tree Creek
- Suisun Creek
- Ulati s Creek
- Unnamed perennial drainage 1
- Unnamed perennial drainage 2

#### *Wildlife in Perennial Drainage*

Amphibians such as the western toad, Sierran chorus frog, and bullfrog are present in the perennial drainages in the BSA. The native western pond turtle (*Actinemys marmorata*) may also be present in perennial drainages. Waterbirds, such as the mallard (*Anas platyrhynchos*), green heron (*Butorides virescens*), great egret (*Ardea alba*), and belted kingfisher (*Megaceryle alcyon*), forage in these waters, and bats, including the Yuma myotis and big brown bat (*Eptesicus fuscus*), forage aerially on insects over these channels. A number of fish also use the creek and stream channels in the watershed, including several species of native fishes such as hardhead (*Mylopharodon conocephalus*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), California roach (*Lavinia symmetricus*), three spine stickleback (*Gasterosteus aculeatus*), and sculpin (*Cottus* spp.), as well as introduced species such as the mosquitofish (*Gambusia affinis*).

## Seasonal Drainage

### *Vegetation*

Seasonal drainage habitat is scattered throughout the BSA and includes both natural and constructed features that carry water on an ephemeral or seasonal basis. Seasonal drainages help to reduce flooding by conveying stormwater during and after storm events. Most natural seasonal drainages in the BSA ultimately drain to Suisun Bay via either Cordelia Slough or Peytonia Slough. Constructed seasonal drainages include features that were artificially constructed in uplands to convey stormwater runoff and do not replace natural features. Both concrete lined and earthen bottom ditches are located alongside roadways, railroads, and agricultural fields throughout the BSA.

### *Wildlife in Seasonal Drainage Habitat*

Wildlife found in seasonal wetlands includes the same bird and amphibian species detailed in the ***Wildlife in Perennial Wetlands*** discussion above. However, the native western pond turtle may also be present in some seasonal drainages when water is present.

## 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 1.4.3, Alternatives Considered but Eliminated from Further Discussion**.

### **Build Alternative**

#### *Direct Impacts*

The Build Alternative effects to the aquatic and wetland habitat, within the BSA are shown in **Table 2.3-3**, which includes isolated calculations for the West and East Segments. Although the impact area is relatively small, the permanent loss of aquatic habitat could affect existing functions and values along both channels if such values were not replaced. Direct permanent impacts on wetlands would occur because of road widening. 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. Temporary impacts on aquatic habitat may occur from grading or access activities and from dewatering as part of placement of coffer dams in the creeks. This work would be temporary in nature and fill would be removed within one season and pre-construction conditions restored. Aquatic habitat is expected to re-establish rapidly after these activities. Permanent impacts would include direct placement of fill within wetlands and loss of wetland vegetation due to shading effects. Impacts to wetlands and other habitat types are shown in **Appendix H**.



Aquatic and wetland communities are natural communities of special concern that perform many important environmental functions, including recycling nutrients, purifying water, attenuating floods, recharging ground water, and providing habitats for flora, fauna, and aquatic species. Detailed descriptions of this habitat and mapping are included in greater detail within the NES (Caltrans, 2014k).

#### *Indirect Impacts*

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 and Best Management Practice (BMPs) that will control pollutant discharges during construction activities are described in **Section 2.2.2, Water Quality and Storm Water Runoff**. Indirect impacts on wetlands also include shading effects from the new wider bridges at Ulatis Creek and Horse Creek within the East Segment. The resulting impact on vegetation growth is expected to be permanent.

The Build Alternative would add over 1 acre of new impervious area, through road and structure 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, and create increased erosion resulting from changes to waterway hydrographs (flow versus time) pre- and post-construction. This phenomenon is termed hydromodification.

Project-specific, permanent effects on aquatic and wetland habitat would be substantial if not mitigated. Coordination with USACE regarding these effects is discussed above in *Affected Environment*.

#### **West Segment – Fundable First Phase**

Construction of the West Segment of the Build Alternative would result in approximately 0.01 acre of permanent impacts to wetland habitat and 0.32 acre of temporary impacts to aquatic habitat 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 West Segment.

### *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 will be completed and 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.

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.

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 East Segment would result in work within the channel of Ulati Creek and Horse Creek. Therefore, a Section 1602 permit would be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative.

Executive Order 11988 directs all federal agencies to avoid the long- and short-term adverse impacts associated with the modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative and to restore and preserve the natural and beneficial values served by floodplains. The project would not result in the substantial or adverse modification of any floodplain. Similarly, the project does not directly or indirectly support further development within a floodplain.

### **No-Build Alternative**

The No-Build Alternative would make no physical or operational improvements to I-80 corridor 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.

### **Least Environmentally Damaging Practicable Alternative**

A detailed discussion of the considerations made in the determination of the LEDPA is included in this section under *Only Practicable Finding*. The Build Alternative encompasses the best possible design, based on predicted 2040 traffic conditions and physical features of the area. The Build Alternative is the LEDPA, and includes measures to reduce harm to wetlands, as described below under *Only Practicable Finding*.

## 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 the temporary and permanent 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 HYDR-1 and WQ-1)** 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. Additionally, avoidance measures would also avoid or minimize impacts to riparian woodlands within the BSA (**Measure BIO-1**) and Caltrans standard BMPs will be incorporated into the project to protect water quality during construction (**Measure BIO-2**). Implementation of these measures (**Measures HYDR-1, WQ-1, BIO-1, and BIO-2**) would provide the avoidance and minimization measures required to minimize the indirect impacts to wetlands and other water features located within the BSA.

**Mitigation Measure BIO-C: Compensatory Mitigation for Aquatic and Wetland Restoration.** Compensation for permanent impacts on up to 0.17 acre of aquatic and wetland habitat will be mitigated at a replacement ratio of 1:1 (created wetlands: impacted wetlands) based on square footage offsite. These effects may be mitigated at a USACE-approved wetland mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turn-key mitigation property located in close proximity to the project, such as Grizzly Bay Preserve. Temporary impacts on 1.23 acres of aquatic habitat (i.e. impacted areas not previously mitigated) will be mitigated on-site by restoring impacted areas to pre-project conditions.

**Mitigation Measure BIO-D: Compensatory Mitigation for Riparian Woodland Replacement.** Compensation for permanent impacts to up to 0.03 acre of riparian habitat will be mitigated at a replacement ratio of 3:1 (habitat replaced: habitat lost) based on acreage offsite. These effects may be mitigated at a CDFW-approved riparian mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turnkey mitigation property located in close proximity to the project, such as Grizzly Bay Preserve.

**Mitigation Measures BIO-C and BIO-D**, in combination with the avoidance and minimization measures listed above (**Measures HYDR-1, WQ-1, BIO-1, and BIO-2**), 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. With the implementation of

these avoidance, minimization, and mitigation measures, the project would not have a substantial effect on riparian woodland or aquatic habitat because no net loss of habitat would occur and other project effects would be relatively small and of a temporary nature.

### ONLY PRACTICABLE FINDING

Executive Order for the Protection of Wetlands (EO 11990) regulates the activities of federal agencies with regard to wetlands. This executive order 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.

Within the existing project corridor, no other build alternatives were deemed viable because of the physical constraints and developed land uses surrounding the roadways. 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 (see **Section 1.4.5, Alternatives Considered but Eliminated from Further Discussion**). As such, there are no alternatives that would avoid impacting wetland resources.

With implementation of the Build Alternative there would be permanent and temporary effects to wetland and water features within the Caltrans right-of-way. However, the appropriate permitting would be obtained and adhered to. A Section 404 permit would be implemented for the Build Alternative. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative. Therefore, a Section 1602 Lake or Streambed Alteration Agreement with CDFW is not necessary for the West Segment.

In addition to the adherence of the permitting requirements stated above, Mitigation **Measures HYDR-1 and WQ-1, BIO-1, BIO-2, BIO-C, and BIO-D** would also ensure that the least possible impact would occur to jurisdictional wetlands and other waters upon project implementation. Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

### 2.3.3 PLANT SPECIES

#### REGULATORY SETTING

The U.S. Fish and Wildlife Service (USFWS) and CDFW have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a

general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see **Section 2.3.5, Threatened and Endangered Species** 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, 2014k).

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: Cordelia, Fairfield South, Fairfield North, Elmira and Allendale, California. The California Natural Diversity Database (CNDDB) was queried for all occurrence records within 10 miles of the BSA. As previously discussed, botanical surveys conducted between 2011 and 2013 to locate, map, and record any special-status plant populations within the BSA. Repeat surveys were conducted throughout the growing season in order to capture the blooming and/or fruiting periods of all target special-status plant species.

The database searches and initial habitat mapping identified 66 special-status plant species that could potentially occur within the BSA [see Appendix D of the NES (Caltrans2014k)]. Only one special-status plant was identified during the protocol-level surveys, Ferris' goldfields (*Lasthenia ferrisiae*), which is listed as a California Rare Plant. This species was

found in a newly re-constructed I-80 on-ramp within the West Segment. The area appeared to have recently undergone construction activities (i.e., the area had been hydroseeded and straw wattles were present at the time of the survey).

Ferris' goldfields is an annual herb in the sunflower family that blooms from February through May. It occurs in central and northern California in alkaline, clayey vernal pools, and clay-based alkaline sinks at elevations of 66 to 2297 feet. Ferris' goldfields is known to be tolerant of soil disturbance and intolerant of competition with non-natives. Construction activities in the area where this plant was found likely temporarily improved habitat quality for this species by reducing competition with non-native grasses and by providing supplemental irrigation. The combination of soil disturbance and irrigation likely stimulated the germination of dormant seeds. However, this population of Ferris' goldfields within the BSA will likely not persist over time, as non-native species become increasingly dominant and the area no longer receives supplemental watering.

## ENVIRONMENTAL CONSEQUENCES

### Build Alternative

Project activities, such as grading, structure and infrastructure placement, and equipment staging, could directly affect individual Ferris' goldfields. Individual plants and populations may be lost as a result of mechanical or physical removal of vegetation in the BSA, and damage to plants may occur as a result of crushing by equipment; trampling; and compaction of soil, which could result in damage to plant roots. These activities could result in death, altered growth, or reduced seed set through physically breaking, crushing, wilting, or uprooting plants. However, due to the proximity of the population to development and the resulting altered hydrology, this population is unlikely to persist, even in the absence of additional construction disturbance. This species was not observed during a reconnaissance site visit on May 9, 2014. Further, this species is widely distributed across California (including Solano County). Thus, project activities would potentially affect only a very small proportion of the regional populations of this species, and possibly would not affect this species at all. Therefore, this project would not result in substantial adverse effects on Ferris' goldfields.

### West Segment –Fundable First Phase

Adverse effects to Ferris' goldfields described above for the Build Alternative are applicable to the West Segment. As previously discussed, the distribution of suitable habitat types within the BSA varies depending on the characteristics and needs of the plant species. Project activities within the West Segment would potentially affect only a very small proportion of the regional populations of this species, and possibly would not affect this species at all. Therefore, the construction of the West Segment would not result in substantial adverse effects on Ferris' goldfields..

### No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to the northbound I-80 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

Project activities are not expected to have a substantial adverse effect on Ferris' goldfields populations or their habitats, thus no avoidance measures or compensatory mitigation is warranted for this species.

## 2.3.4 ANIMAL SPECIES

### REGULATORY SETTING

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in **Section 2.3.5, Threatened and Endangered Species**. 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 NES prepared for the project (Caltrans, 2014k).

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, the CNDDDB for the five USGS quadrangles surrounding the BSA, reports previously prepared for the project, other relevant information from the CDFW, technical publications, field reconnaissance surveys, and habitat assessments completed for the project. The results of these efforts are further discussed under the appropriate topics within this section, and are documented in the NES.

A literature and database search, and the biologist's familiarity with the region, identified 55 wildlife species that could potentially occur within the BSA. **Appendix I** lists each of these species and describes whether or not the species could occur in the BSA. A wildlife habitat assessment was conducted within the BSA in 2011, 2012, and 2013 and 37 of these species were dropped from consideration based on a lack of suitable habitat, or because the BSA is outside the known range of the species. 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:**

- Valley elderberry longhorn beetle
- Central Valley steelhead
- Central California Coast steelhead
- California red-legged frog
- Swainson's hawk

The short-eared owl (*Asio flammeus*) is only a California species of special concern when nesting, and it is not expected to breed in the BSA or be adversely affected by project activities. Thus, it is not discussed further. The remaining 12 special-status species are discussed below.

### **Central Valley Fall-Run Chinook Salmon**

The Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*) is an anadromous California species of special concern that represents a population of Chinook salmon that migrate from the ocean to spawning streams in late fall and begin spawning in beds of coarse river gravels between October and December. Chinook salmon spawn and rear in the mainstem Sacramento River and suitable perennial tributaries. The species has been documented within several drainages that run through the BSA. More recently, Chinook salmon have been observed in the project region in:



- Green Valley Creek upstream to the base of Green Valley Falls
- Suisun Valley Creek upstream to the Napa/Solano County line
- Ledge wood Creek upstream of I-80
- Laurel Creek from upstream to Travis Boulevard
- Immediately north of I-80
- Ulati s Creek at Nut Tree Road

### **American Badger**

The American badger (*Taxidea taxus*), a California species of special concern, is a highly specialized fossorial (adapted for burrowing or digging) mammal that occurs in a range of habitats, such as annual grasslands, oak woodland savannas, and semi-arid shrub/scrubland, that contain friable soils and relatively open ground. Badgers are primarily nocturnal, though they are often active during the day. They dig burrows both in pursuit of prey (e.g., gophers, kangaroo rats, and chipmunks) and to create dens for cover and raising of young. Badgers breed during late summer, and females give birth to a litter of young the following spring. Solitary animals, the home range of individuals varies by sex, season, and resource availability.

Suitable habitat is present in the BSA and surrounding vicinity, as evidenced by the observation of a roadkill individual within the BSA during surveys of the site. Because badgers are territorial and solitary, and have large home ranges, badgers are expected to occur in the BSA only in very low numbers. They are most likely to occur in the central portion of the BSA where large expanses of grassland occur adjacent to the I-80 corridor.

### **Western Pond Turtle**

The western pond turtle, (*Actinemys marmorata*) is a California species of special concern. Western pond turtles can be found in intermittent and perennial slow-moving waters, including stock ponds, streams, rivers, marshes, and lakes. Pond turtles require areas with ample basking sites and underwater refugia, and eggs are laid in grasslands or other open uplands. Nesting sites seem to require open habitat with full sun exposure and are typically located along stream or pond margins, but if no suitable habitat is available adults may travel overland up to 0.25 mile or more from water to nest. The nesting season typically occurs from April through July with the peak occurring in late May to early July. Suitable habitat is present in the BSA and the species was observed during surveys of the site. Although no focused surveys were performed for this species, individuals were observed in Laguna Creek within the BSA during field surveys. In addition, the CNDDB includes a record of this species in a channel near the outlet of Lagoon Valley Reservoir approximately 0.2 mile east of the BSA. All the perennial drainages and wetlands within the BSA provide suitable aquatic

foraging and dispersal habitat for the pond turtle year round, while the seasonal drainages and wetlands provide suitable foraging and dispersal habitat when water is present. Further, uplands adjacent to wetlands and drainages within the BSA provide potential nesting habitat for the species.

### Bat Species

Three 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 red bat (*Lasiurus blossevillii*), a California species of special concern.

Pallid bats are most commonly found in oak savannah and in open dry habitats with rocky areas, trees, buildings, or bridges for roosting. Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in the crevices, hollows, and exfoliating bark of trees. Colonies can range from a few individuals to over a hundred, and usually this species occurs in groups larger than 20 individuals. Males and females typically occupy the same late-fall and winter roosts found in canyon bottoms and riparian areas. After mating with males during the late-fall and winter season, females leave to form a separate maternity colony, often on ridge tops or other warmer situations. Pups are typically born from late April to July, and weaning occurs in August, although dates vary across latitudes and between years. Although crevices are important for day roosts, night roosts often include open buildings, porches, garages, highway bridges, and mines. Pallid bats may travel up to several miles for water or foraging sites if roosting sites are limited. They may also occur in open coniferous forests. Pallid bat roosts are very susceptible to human disturbance. Eight bridges/culvert crossings within the BSA provide suitable roosting habitat. Although no pallid bats were detected during focused surveys of these structures, the surveys were conducted outside the maternity season.

The Townsend's big-eared bat is a colonial species, and females aggregate in the spring at maternity colonies to begin their breeding season, which may extend through the end of August. Females give birth to one young, and females and young show a high fidelity to both their group and their specific roost site. Although the Townsend's big-eared bat is usually a cave dwelling species, many colonies are found in anthropogenic structures, such as the attics of buildings or old abandoned mines. Known roost sites in California include limestone caves, lava tubes, mine tunnels, buildings, and other structures. This species also roosts in deep crevices of redwood trees. Radio tracking studies suggest that movement from a colonial roost during the maternity season is confined to the area within 9 miles of the roost. This species is easily disturbed while roosting in buildings, and females are known to abandon their young when disturbed. Suitable roosting habitat is not present in the BSA; however, the species may forage over the BSA and was detected during focused bat surveys of the area.

The western red bat does not breed in the project area but roosts in the foliage of trees in Solano County during winter or migration. Western red bats are strongly associated with intact cottonwood/sycamore valley riparian habitats in low elevations and the loss of such habitat throughout its range threatens the persistence of the species. Both day and night roosts are usually located in the foliage of trees; red bats in the Central Valley show a preference for large trees and extensive, intact riparian habitat. Day roosts are often located along the edges of riparian areas, near streams, grasslands, and even urban areas. During the breeding season, red bats establish individual tree roosts and occasionally small maternity colonies in riparian habitats, in locations usually hidden from every direction except below. Little is known about the habitat use of western red bats during the nonbreeding season. The red bat uses echolocation to capture insects in mid-flight and require habitat mosaics or edges that provide close access to foraging sites as well as cover for roosting. This species was detected at three locations within the BSA.

Focused surveys within the BSA identified six bridges/culvert crossings (including sites in both the East and West Segments) that provide suitable night roosting habitat for bats, and two bridges (both in the East Segment) that provide potential day roosts (see **Table 2.3-5**).

No pallid bats were detected during these surveys, suggesting that the species does not regularly use the BSA. However, the surveys were conducted between 31 August and 1 October, which is outside the pallid bat maternity season. As pallid bats can occupy different roost sites during the maternity season than during the fall, it is possible that pallid bats could day and/or night roost in several bridges/crossings identified in **Table 2.3-5**. Although suitable roosting habitat for the Townsend's big-eared bat is not present in the BSA due to the lack of caves, mines, or abandoned buildings, suitable foraging habitat is present and the species was detected foraging in the BSA during focused bat surveys. Western red bats were detected in the BSA during the focused bat surveys in low numbers, and may roost in foliage in trees, particularly those within the riparian habitat throughout the BSA.

Specifically, in the West Segment, focused surveys for bats and bat roosting habitat within the BSA identified four bridges/culvert crossings that provide suitable night roosting habitat for bats, including the pallid bat. However, no potential day roosting habitat for bats was identified within the West Segment (see **Table 2.3-5**). Although suitable roosting habitat for the Townsend's big-eared bat is not present within the West Segment, suitable foraging habitat is present. Western red bats occur in the West Segment, in low numbers as migrants and winter residents and may roost in foliage in trees, particularly those within riparian habitat.

**Table 2.3-5 Bridge/Crossing Structures within the BSA that Provide Bat Roosting Habitat**

Bridge/Crossing	Segment	Day Roosting Habitat Present?	Night Roosting Habitat Present?	Bats Detected
Green Valley Creek Bridge	West	No	Yes	Yuma myotis California myotis
Dan Wilson Creek Bridge	West	No	Yes	Yuma myotis California myotis
Suisun Creek Bridge	West	No	Yes	Yuma myotis California myotis Western red bat
Ledgewood Creek Bridge	West	No	Yes	None
Soda Springs Culvert	East	Yes	Yes	Yuma myotis California myotis Western red bat Townsend's big-eared bat
Laurel Creek Culvert	East	No	Yes	Yuma myotis California myotis Western red bat Townsend's big-eared bat
Laguna Creek Bridge	East	Yes	Yes	Yuma myotis
Alamo Creek Bridge	East	No	Yes	Yuma myotis California myotis

Source: Caltrans 2014k

**Burrowing Owl**

The burrowing owl (*Athene cunicularia*) is a California species of special concern. This species favors flat, open grassland or gentle slopes and sparse shrubland ecosystems for breeding, though they will also readily colonize agricultural fields and other developed areas. Mammal burrows, or other structures that mimic burrows, provide secure nesting locations and nonbreeding refuges and are a fundamental ecological requirement of burrowing owls. In California, owls are most often found in close association with California ground squirrel burrows. Ideal habitat for burrowing owls is comprised of annual and perennial grasslands with low vegetation height, sparse or nonexistent tree or shrub cover, and an abundance of mammal burrows. The nesting season as recognized by the CDFW (1995) runs from February 1 through August 31. After nesting is completed, adult owls may remain in their

nesting burrows or in nearby burrows, or may migrate; young birds disperse across the landscape.

No burrowing owls, or secondary evidence of owl presence, were observed within the BSA during reconnaissance surveys, although the biologists did not conduct focused surveys for this species. However, burrowing owl habitat is present within the BSA, and five occurrences of the species have been recorded in the project vicinity; the nearest known extant population located approximately 1.2 miles to the east. Suitable habitat (i.e., ground squirrels and other small mammal burrows) was observed in the grasslands and ruderal areas in the BSA. Burrowing owls may nest and/or forage within these areas.

### **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 native birds in the project area are protected under the MBTA and California Fish and Game Code. In addition to common bird species, several special-status bird species have at least some potential to nest or forage within the BSA, including:

- Swainson's hawk (*Buteo swainsoni*), State threatened species
- Northern harrier (*Circus cyaneus*), California species of special concern
- Grasshopper sparrow (*Ammodramus savannarum*), California species of special concern.
- Tri-colored blackbird (*Agelaius tricolor*), California species of special concern at its nesting colonies.
- Loggerhead shrike (*Lanius ludovicianus*), California species of special concern when nesting.
- White-tailed kite (*Elanus leucurus*), State fully protected species.

The Swainson's hawk is discussed in **Section 2.3.5, Threatened and Endangered Species**. The northern harrier nests in marshes and moist fields, and forages over open areas. Grasslands and agricultural fields in and adjacent to the BSA provide suitable nesting and foraging habitat. Northern harriers have been observed in the vicinity of the BSA although none were observed within the BSA during surveys conducted by the biologists. The grasslands and marsh habitat within the BSA provide suitable foraging habitat for this species; however, harriers typically nest and forage in the interiors of large expanses of open habitat, not very close to high volume roadways. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

Tri-colored blackbird nesting colonies are usually located near fresh water in dense emergent vegetation. The species is highly colonial when nesting, forming dense breeding colonies that, in some areas, may consist of up to tens of thousands of pairs. Suitable nesting and

foraging habitat is present in the BSA. Potential foraging habitat (e.g., perennial marsh, seasonal marsh, and grasslands) for the tricolored blackbird is present within and immediately adjacent to the BSA. However, the tricolored blackbird has not been recorded breeding in the BSA, the nearest record of its occurrence is located approximately 11 miles to the east near Jepson Prairie Preserve, and the species is not expected to breed within the BSA due to the high levels of disturbance associated with the freeway. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

The grasshopper sparrow breeds in open, short grasslands with scattered clumps of shrubby vegetation, constructing domed ground nests with grasses in patches of dense vegetation. They nest and forage in extensive open grasslands, meadows, fallow fields, and pastures. Grasslands within the BSA provide suitable nesting and foraging habitat for the grasshopper sparrow. Although some grasslands within the BSA represent potentially suitable breeding and foraging habitat for the grasshopper sparrow, much of the grassland habitat occurs as small, isolated patches that are unlikely to be occupied by this species, which prefers large, unfragmented areas of grassland. Further, this species is not expected to nest close to I-80, both due to the disturbance and noise associated with the highway and because this species typically nests in the interiors of large grassland areas, rather than at the edges formed by the highway. The species has been observed in the vicinity of the BSA, although none were observed within the BSA during surveys conducted by the biologists.

The loggerhead shrike can be found in grasslands, scrub habitats, riparian areas, other open woodlands, ruderal habitats, and developed areas including golf courses and agricultural fields. Ideal breeding habitat for loggerhead shrikes is open, with short grassy vegetation punctuated by many perches, shrubs, or trees for nesting, and sharp branches or barbed wire fences for impaling prey. They nest in tall shrubs and dense trees and forage in grasslands, marshes, and ruderal habitats. The breeding season may begin as early as late February and lasts through July. Suitable breeding and foraging habitat is present in the BSA and the species was observed during surveys of the BSA. However, because of the BSA's proximity to I-80, particularly given that high quality nesting and foraging habitat (e.g., open agricultural fields and pastures) more removed from the high levels of disturbance caused by the I-80 are abundant in the project region, the number of pairs of loggerhead shrikes that may nest in the BSA is expected to be very low.

The white-tailed kite (*Elanus leucurus*), a State fully protected species, is a year-round resident in the project vicinity, establishing breeding territories in grasslands, agricultural fields, cismontane woodlands, and other open habitats that encompass open areas with healthy prey populations, and snags, shrubs, trees, or other nesting substrates. The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles. The presence of prey may be the most important factor in determining habitat quality for white-tailed kites. This species nests in tall shrubs and trees and forages in grasslands, marshes, and ruderal habitats. Suitable nesting and foraging habitat is present and the species was observed during surveys of the BSA. However, because of the BSA's proximity to high levels of disturbance caused by I-80, and the abundance of high quality nesting and foraging habitat

(e.g., open agricultural fields and pastures) more removed from freeway corridor, the number of pairs of white-tailed kites that may nest in the BSA is expected to be very low.

## ENVIRONMENTAL CONSEQUENCES

### **Build Alternative**

#### *Central Valley Fall-Run Chinook Salmon*

The project would result in the permanent loss of 0.03 acre of perennial drainage due to placement of new piers at the Ulati and Horse Creek bridge crossings and increased shading of aquatic habitat due to the new wider bridges. The project would also result in the temporary disturbance of 0.37 acre of perennial drainage due to temporary dewatering for construction (if required) and construction access at the Ulati and Horse Creek bridge sites. The majority of reaches with the most suitable gradient for salmonid habitat in Upper Ulati Creek, including the reach within the BSA, are located in a region that exceeds the temperature threshold for salmonids (i.e., too hot to provide suitable rearing habitat in summer). In addition, two potential fish passage barriers (i.e., water control structures that create 6-foot vertical drops in the concrete-lined portions of the flood control channel) have been identified in Ulati Creek downstream of the BSA, reducing the potential for salmonids to reach the project area. Similarly, Horse Creek within the BSA appears to go dry often during the summer months and is unlikely to support salmonid rearing habitat in the summer. Because of the low quality of salmonid habitat within the reaches of Ulati Creek and Horse Creek within the BSA, Chinook salmon are not expected to be present in any numbers.

Salmonids may experience reduced foraging success due to project-related turbidity downstream. Although the project proposes modification of the bridges at Ulati and Horse Creeks to facilitate widening of the freeway, the modifications would not result in the addition of new barriers or exacerbation of any existing impediments to salmonid movement.

#### *American Badger*

Implementation of the Build Alternative would not result in the loss of a substantial amount of habitat for the American badger; only 2.67 acres of non-native annual grassland would be permanently impacted. Grasslands are abundant in the project region, and the loss of 2.67 acres would not result in a substantial decrease in the amount of this habitat type available regionally to the species. Further, the project would not impede movement of badgers through the area or substantially increase the risk of road mortality. However, badgers may occur in the BSA in low numbers and may be directly impacted by project activities through injury and mortality. If badgers have to be evicted from their dens, there is some potential that they may be exposed to greater predation risk or greater road mortality while they are seeking out new denning sites, especially if suitable habitat in adjacent areas is already occupied by badgers. However, the number of badgers within the BSA is expected to be extremely low.

### *Western Pond Turtle*

Implementation of the Build Alternative might result in the injury or mortality of small numbers of turtles as a result of individual turtles or their eggs being crushed by personnel or equipment or as a result of desiccation or burying during project work near perennial drainages and wetlands within the BSA. The Build Alternative would result in the permanent loss of 0.17 acre of aquatic/wetland habitat due to the placement of piers at the Ulati and Horse Creek bridge sites, and the fill of wetlands due to the widening of the freeway in the East Segment. Due to the regional abundance of similar aquatic/wetland habitats in the project vicinity, the loss of 0.17 acres of aquatic habitat is not expected to result in a substantial adverse effect on the western pond turtle.

### *Bat Species*

The Build Alternative may result in a temporary impact on foraging pallid bats, western red bats, and Townsend's big-eared bats through the alteration of foraging patterns (e.g., avoidance of work sites because of increased noise and activity levels during project construction). However, due to the abundance of suitable foraging habitat in the project vicinity and the mobility of these bats, as well as the relatively low proportion of potential foraging habitat that would be disturbed as a result of the project, impacts to these three bat species would not be substantial.

### Pallid Bat

Implementation of the Build Alternative would not result in the modification of any structures identified as providing suitable day and/or night roosting habitat for bats. Thus, the project is not expected to result in the permanent loss of roosting habitat or the pallid bat. However, project disturbance associated with construction activities near bridges that provide suitable pallid bat day roosting habitat (i.e., Laguna Creek Bridge and Soda Springs Culvert) could result in bats flushing from their roost under a bridge during the day. These bats could potentially suffer increased predation rates, and construction during the maternity season (April 1 to July 31) could result in abandonment of young by their mothers, resulting in mortality of the young.

### Western red bat

Construction of the Build Alternative could result in the loss of roosting sites for western red bats due to tree removal. Further, if trees that contain individual western red bats are removed, modified, or exposed to increased disturbance, individual bats could be subjected to physiological stress as a result of being disturbed during torpor, or subjected to increased predation due to exposure during daylight hours. However, red bats are likely to flush from trees when approached by heavy equipment, before trees themselves are impacted, so that injury or mortality is unlikely. Further, western red bats are not colonial. Thus, the permanent loss of a roost site (e.g., tree) would not result in a substantial impact on local or regional populations as only individuals, not entire colonies, would be affected. Further,



suitable roost sites for this species are sufficiently abundant and widespread that the loss of small numbers of trees from the project would not substantially reduce roost site availability, either locally or regionally.

#### Townsend's big-eared bat

Townsend's big-eared bats are not expected to roost in the BSA. Thus, the project would not adversely affect roosting habitat for this species.

#### *Burrowing Owl*

The Build Alternative is not expected to result in impacts on high-quality burrowing owl breeding habitat due to the proximity to I-80 and the lack of evidence of owl use in the project limits. However, the project would result in impacts on low-quality nesting, foraging, and/or roosting habitat for burrowing owls. Approximately 2.67 acres of nonnative annual grassland and 4.80 acres of ruderal habitat would be permanently lost as a result of roadway improvements. In addition, 11.28 acres of non-native annual and 9.98 acres of ruderal habitats would be temporarily disturbed as a result of project staging and temporary construction access. However, such areas will be restored to pre-construction conditions following project completion. In the unlikely event that owls are found to be nesting within the BSA, construction related disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment.

#### *Migratory Birds*

Although project activities would occur along the margins of suitable habitat for the Swainson's hawk, northern harrier, grasshopper sparrow, tri-colored blackbird, loggerhead shrike, and white-tailed kite, the potential for such activities to disturb a nest to the point of abandonment would be very low because none of these species are expected to nest near the high volume roadway where project activities would be concentrated. Further, although vegetation removal for the Build Alternative could reduce nesting habitat for a number of bird species protected under the Migratory Bird Species Act, disturbance of foraging habitat would unlikely have a substantial effect on local and regional populations of these species because of the low number of breeding birds relative to the extent of suitable foraging habitat and abundance of prey. Therefore, the project is not expected to substantially reduce these species' populations or nesting habitats and any project impacts would be minimal.

### **West Segment – Fundable First Phase**

Adverse effects to animal species described above for the Build Alternative are applicable to West and East Segments. The effects summarized in the above discussion provide specific sensitive habitat locations for each animal species. As previously discussed, the distribution of suitable habitat types within the BSA varies depending on the characteristics and needs of the animal species. The West Segment portion of the Build Alternative, from west of Red Top Road to Air Base Parkway, would convert approximately eight miles of existing HOV lanes into express lanes. Work would comprise mostly of foundation installation for poles and

gantries where new signs would be installed and foundation pad and trenching for electrical conduits. Certain impacts are more prevalent in the East Segment of the Build Alternative because of the more expansive work proposed as part of the freeway widening, specifically the structural improvements proposed at Ulatis Creek and Horse Creek. The construction activities needed for the conversion of the HOV lanes to express lanes within the West Segment is substantially less intensive. As such, the West Segment of the Build Alternative is expected to have lower direct and indirect effects to animal species when compared to the East Segment (see **Table 2.3-2**).

The Build Alternative would have no impact on stream crossings within the West Segment; no adverse effects to Chinook salmon are anticipated. Within the West Segment, only 0.07 acre of non-native annual grassland would be permanently impacted. Thus, construction of the West Segment would not have a substantial adverse effect on the American Badger habitat. Construction of the West Segment would not require work near any structures identified as providing suitable day roosting habitat for bats (i.e., Laguna Creek Bridge and Soda Springs Culvert). Construction of the West Segment would therefore not have the potential for day roost disturbance.

### **No-Build Alternative**

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no 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**

#### *Central Valley Fall-Run Chinook Salmon*

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 HYDR-1 and WQ-2** and **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below), 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 **Measure BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8** as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below include provisions on worker environmental training, construction to avoid take, disturbances or injury of the Chinook salmon, habitat protection, and biological monitoring.

#### *American Badger*

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures** below would reduce the potential for adverse effects to the American badger during project construction. These measures include pre-construction surveys (**Measure BIO-9**) and development of appropriate measures, in consultation with the CDFW, if an active den is found (**Measure BIO-10** and **BIO-11**).

#### *Western Pond Turtle*

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures** below would reduce the potential for adverse effects to the western pond turtle during project construction. These measures include water quality protection during construction (**Measure BIO-2**), pre-construction surveys (**Measure BIO-12**), required buffer zones if a nest is detected (**Measure BIO-13**), and daily surveys during construction when warranted (**Measure BIO-14**).

#### *Bat Species*

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for effects to roosting bats during project construction. These measures include work restrictions and buffer zones for day roosting habitat (**Measure BIO-15**), bat eviction procedures and timelines (**Measure BIO-16**), and biologist assessments (**Measure BIO-17**).

#### *Burrowing Owl*

##### **Mitigation Measure BIO-E: Compensatory Mitigation for the Burrowing Owl.**

Compensatory mitigation will be provided in the form of habitat preservation and/or management if burrowing owls are located in the BSA during pre-construction surveys. The loss of foraging and nesting habitat in the project construction area will be offset by acquiring and permanently protecting suitable foraging and breeding habitat.

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for effects to burrowing owls during project construction. These measures include preconstruction surveys (**Measure BIO-18**), biologist consultations and recommendations (**Measure BIO-19**), and coordination with regulatory agencies for any owl evictions (**Measure BIO-20**).

Implementation of the avoidance and minimization measures and mitigation measure listed above would ensure that active burrowing owl nests are not disturbed, that individuals are safely relocated before their burrows are impacted, and that permanent loss of occupied burrowing owl breeding habitat is adequately compensated.

#### *Migratory Birds*

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to migratory bird species. These measures include a work window for vegetation removal and preconstruction surveys (**Measure BIO-21**), deterrence of nesting birds and nest-start removal (**Measure BIO-22**), and non-disturbance buffers for nesting birds (**Measure Bio-23**).

#### **West Segment – Fundable First Phase**

No avoidance, minimization, or mitigation measures specific to the West Segment would be required beyond the ones described above under the Build Alternative. The West Segment portion of the Build Alternative, from west of Red Top Road to Air Base Parkway, would convert approximately eight miles of existing HOV lanes into express lanes. Work would comprise mostly of foundation installation for poles and gantries where new signs would be installed and foundation pad and trenching for electrical conduits. Certain impacts are more prevalent in the East Segment of the Build Alternative because of the more expansive work proposed as part of the freeway widening, specifically the structural improvements proposed at Ulatis Creek and Horse Creek. The construction activities needed for the conversion of the HOV lanes to express lanes within the West Segment is substantially less intensive. As such, the West Segment of the Build Alternative is expected to have lower direct and indirect effects to animal species when compare to the East Segment (see **Table 2.3-2**). 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 Ulatis Creek are thereby only applicable to East Segment 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 with the potential to occur within the BSA is provided in **Appendix H**.

#### **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 USFWS and the 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 CDFW is the agency responsible for implementing CESA. Section 2081 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

### **Valley elderberry longhorn beetle**

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is a Federally threatened species. The beetle’s habitat consists primarily of riparian forests whose dominant plant species include cottonwood, sycamore, valley oak, and willow, with an understory of elderberry shrubs. Blue elderberry shrubs in the Central Valley with basal stem diameters larger than 1 inch are considered by the USFWS as potential valley elderberry longhorn beetle habitat. The valley elderberry longhorn beetle life cycle is intimately connected to its habitat, elderberry shrubs. Following mating, the female lays her eggs in crevices in the elderberry bark. Upon hatching (after about 10 days), the larvae bore into the

pith of the shrub and feed inside stems larger than 1 inch in diameter for 1 to 2 years until they mature. They emerge during the spring as adults through exit holes chewed through the bark. The adult beetles feed on the elderberry foliage until they mate, completing the cycle. The BSA is not within designated critical habitat for the valley elderberry longhorn beetle. However, suitable habitat (i.e., elderberry shrubs) is present in the BSA and the beetle species has been documented approximately 0.03 mile west of the BSA. Thirty-eight elderberry shrubs with a minimum diameter of 1 inch at ground level were mapped within the BSA (Caltrans 2014k). No valley elderberry longhorn beetles were observed during survey, but potential beetle bore holes were observed, confirming the species' presence. The valley elderberry longhorn beetle is shown as threatened in the *Invertebrates* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

### Central Valley steelhead

The Central Valley steelhead (*Oncorhynchus mykiss*) is a Federally threatened species. The steelhead is an anadromous form of rainbow trout that migrates upstream from the ocean to spawn in late fall or early winter, when flows are sufficient to allow it to reach suitable habitat in far upstream areas. Steelhead typically spawn in gravel substrates located in clear, cool, perennial sections of relatively undisturbed streams, with dense canopy cover that provides shade, woody debris, and organic matter. Steelhead usually cannot survive long in pools or streams with water temperatures above 70 °F; however, they can use warmer habitats if adequate food is available. The NMFS has categorized steelhead into distinct population segments (DPS).

The Central Valley DPS, includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in the Sacramento and San Joaquin rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries, as well as two artificial propagation programs: the Coleman National Fish Hatchery, and Feather River Hatchery steelhead hatchery programs. This species spawns in cool, moderately fast flowing water with gravel bottom. No critical habitat is present within the BSA. However, the Central Valley steelhead range overlaps the northeastern-most portion of the BSA (i.e., Ulati and Alamo Creeks), and a winter steelhead distribution map produced by the CDFW indicates that anadromous steelhead were observed in 2004 in Alamo Creek and Ulati Creek. Central valley steelhead is shown as threatened in the *Fish* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

### Central California Coast steelhead

The Central California Coast steelhead, (*Oncorhynchus mykiss*), is a Federally threatened species. As discussed above for the Central Valley species, the Central California Coast steelhead is an anadromous form of rainbow trout categorized into a DPS. The Central

California Coast DPS consists of all runs from the Russian River in Sonoma County south to Aptos Creek in Santa Cruz County, including all steelhead spawning in streams that flow into the San Francisco Bay. This species requires cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats. No critical habitat for salmonids is present within the BSA. The Central California Coast steelhead range overlaps all but the northeastern-most portion of the BSA, and a winter steelhead distribution map produced by the CDFW indicates that anadromous steelhead were observed in 2004 in Jameson Canyon Creek, Green Valley Creek, and Suisun Valley Creek. In 2005, there were reports of steelhead being observed in Green Valley Creek and Suisun Valley Creek, with observations being made at several locations upstream of I-80 on Green Valley Creek. Central California coast steelhead is shown as threatened in the *Fish* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

### **California red-legged frog**

The California red-legged frog, (*Rana draytonii*) is a Federally threatened species. The species inhabits perennial freshwater pools, streams, and ponds. The key to this species' occurrence in these habitats is the presence of perennial, or near perennial, water and a general lack of introduced aquatic predators.<sup>2</sup> Adults need dense shrubby or emergent riparian vegetation closely associated with deep (more than 2.3 feet) still or slow-moving water. Preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters, as well as shallow benches to act as nurseries for juveniles. Non-breeding frogs may be found adjacent to streams and ponds in grasslands and woodlands as refugia. The species does not have a distinct breeding migration as some remain at breeding sites all year while others disperse. Movements may occur along riparian corridors, but some individuals move directly from one site to another through normally inhospitable habitats. The distance moved is highly site-dependent, as influenced by the local landscape. The USFWS considers 1 mile a typical dispersal distance for the species in its critical habitat designation.

The project BSA does not fall within designated critical habitat; however, the southwestern most end of the BSA is located immediately adjacent to critical habitat units Sol-1 and Sol-3 (see Appendix A of the NES). Suitable habitat is present, and one individual was observed during protocol-level red-legged frog surveys of the BSA on the westbound (northwest) side of I-80, in a ponded area of Jameson Canyon Creek (a culvert inlet flowing under I-80). In addition, there are 13 CNDDDB records of California red-legged frogs in Solano County, including a known California red-legged frog breeding pond located approximately 0.2 mile west northwest of the junction of SR 12 and I-80. This record is the northern-most record in Solano County.

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<sup>2</sup> A perennial water body is one that keeps full or flowing water throughout the year.

As the dispersal distance of the California red-legged frog is approximately 1 mile, portions of the BSA located more than 1 mile north of the northern-most breeding pond or waterways hydrologically connected to this breeding pond are considered to be outside the range of the California red-legged frog. Thus, the species is presumed absent from the northeastern portion of the West Segment and the entire East Segment. This presumption is supported by the negative results of protocol-level red-legged frog surveys within those areas. Within the southwestern portion of the West Segment, where the species is presumed present, natural habitats in the median of I-80 are not considered habitat for the California red-legged frog. Heavily traveled roads are considered barriers to this species, with the exception that frogs may be able to pass under such roadways where underpasses or culverts are present. As such, the habitat within the BSA that is considered potential California red-legged frog habitat consists of natural land cover types (i.e., other than “developed”) that are located on the outer edges of the existing highway, and creeks/culverts that flow under I-80. California red-legged frog is shown as threatened in the *Amphibians* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

### **Swainson’s hawk**

The Swainson’s hawk is a California state threatened species. Swainson’s hawks in California are strongly associated with riparian habitats, though they are also found in oak woodlands and other open habitats. Prime breeding habitat for the Swainson’s hawk encompasses riparian draws or clumps of trees surrounded by open grassland or oak savannah for foraging. In the project region, Swainson’s hawks forage in dryland pasture and irrigated pasture, as well as row crops and grain crops, particularly during and after harvest, when prey are numerous and conspicuous. They are also attracted to flood irrigation areas, primarily in alfalfa fields, when prey take refuge on field margins. Swainson’s hawks build sturdy stick nests in low willows, box elders, oaks, or other trees, breeding from early March through July. Individuals frequently use the same nest or nest tree in successive breeding seasons or move. Suitable nesting and foraging habitat is present in the BSA and the species was recorded nesting within the BSA, north of Cherry Glen Road, in 2005 and in eucalyptus trees bordering Pine Tree Creek in 1996 through 2006.

No Swainson’s hawk nests were observed within the BSA during focused surveys conducted in 2012. However, suitable nest trees are present within the riparian woodlands and eucalyptus groves in both the East and West Segments. Swainson’s hawk were observed flying over the BSA during field surveys in September 2011 and April 2012, just east of the I-505/I-80 interchange. Further, there are two CNDDDB records of nesting Swainson’s hawks within the East Segment of the BSA: one pair nested in a eucalyptus tree north of Cherry Glenn Road (nest occupied 2004-2005); and a second pair nested in a eucalyptus tree bordering Pine Tree Creek near the Nut Tree Airport (nest occupied 1996-2006). However,



the highest densities of breeding Swainson's hawks in Solano County occur within irrigated agricultural areas in the north-central and northeastern portions of the County, and over 95 percent of all Swainson's hawk records in the County occur to the north and east of the BSA.

The CDFW defines an active Swainson's hawk nest as one that was used during one or more of the last five years. Based on this criterion, there are currently no known active nests within the BSA. The nearest active nest is the nest located east of Pleasants Valley Road. The BSA also includes 3.71 acres of row crops and 108.05 acres of nonnative annual grasslands that may serve as foraging habitat for the Swainson's hawk. However, Swainson's hawks have not been observed foraging within the BSA, and it is unlikely that Swainson's hawks forage frequently or in large numbers in the roadside areas within the BSA, given the abundance of suitable foraging habitat further away from I-80.

## ENVIRONMENTAL CONSEQUENCES

### Build Alternative

Valley elderberry longhorn beetles, California Valley and Central California Coast steelheads, California red-legged frogs, and Swainson's hawks may be adversely affected by the construction of the Build Alternative. Specific impacts for each of these species are detailed below. Construction activities would have temporary and permanent effects on various habitat types that provide upland, foraging, and dispersal habitats for these protected species. Proposed compensatory mitigation for impacts to each protected species is provided in the *Avoidance, Minimization, and Mitigation Measures* section presented further below. Final approved avoidance, minimization, and mitigation measures have been determined in consultation with the appropriate permitting agencies.

#### *Valley elderberry longhorn beetle*

The Build Alternative would not have any direct impacts on the valley elderberry longhorn beetle or its habitat through project design treatments and implementation of construction measures to avoid habitat. Indirect impacts to the species and/or habitat could occur if construction activities are conducted within 100 feet of the elderberry shrubs through dust generation, vehicle and equipment refueling, and herbicide use. Two of the 38 elderberry shrubs mapped within the BSA were determined to be located within 100 feet of project temporary impact areas. Implementation of the avoidance measures presented in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize impacts on individuals and their habitat due to indirect impacts from dust, soil compaction, and accidental spills. No compensatory mitigation is required. The project **may affect, but is not likely to adversely affect**, the valley elderberry longhorn beetle and will have no effect on critical habitat for this species.

#### *Central Valley steelhead and Central California Coast steelhead*

Direct and indirect impacts to the Central Valley steelhead and Central California Coast steelhead and their habitat would result due to loss or disturbance of, habitat as detailed

above for the Central Valley Fall-Run Chinook salmon in **Section 2.3.4, Animal Species**. The project **may affect, but is not likely to adversely affect**, the Central Valley steelhead and Central California Coast steelhead and will have no effect on critical habitat for these species. Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below would avoid takes of, and impacts to, salmonids. No compensatory mitigation is required.

#### *California red-legged frog*

The Build Alternative could affect individual red-legged frogs as a result of the following:

- Direct injury or mortality during construction as a result of trampling by construction personnel or equipment;
- Direct injury or mortality from the collapse of underground burrows (which may be used as refugia in upland areas by red-legged frogs), resulting from soil compaction;
- Substrate vibrations may cause individuals to move out of refugia, exposing them to a greater risk of depredation or desiccation, may interfere with predator detection, and may result in a decrease in time spent foraging;
- Individuals that are found during pre-activity surveys and relocated to suitable habitat outside of the BSA may be subjected to physiological stress and greater risk of predation, or may undergo increased competition with other amphibians already present in the area to which they are relocated; and
- Reduction of suitable dispersal and foraging habitat resulting from the permanent loss of non-native annual grasslands and other upland habitats.

The project would not result in any impacts on suitable breeding habitat for the California red-legged frog, including perennial wetlands, perennial drainages, or seasonal wetlands within the species' range. The Build Alternative would impact up to 1.67 acres of potential red-legged frog foraging and dispersal habitat, all located within the West Segment. It is assumed that red-legged frogs could occur virtually anywhere in the portion of the BSA within the species' range, all impacted natural habitats (i.e., areas that were not already paved or otherwise developed) within this range, and that were not located within the highway median were considered impacted red-legged frog habitat. The project **may affect, and is likely to adversely affect**, the California red-legged frog.

#### Permanent Impacts

Approximately 0.04 acre of potential red-legged frog dispersal habitat would be permanently lost due to the construction of pavement and other hardscape in areas that currently provide natural habitat that may be used by red-legged frogs. This permanently impacted habitat consists of coyote brush scrub, non-native annual grassland, and ruderal habitats along the edge of the freeway.

### Temporary Impacts

Approximately 1.62 acres of potential red-legged frog habitat, including aquatic habitat for foraging and upland/riparian habitat for cover and dispersal, would be used for temporary construction access and staging while the project is being constructed or would be impacted by grading (cut/fill) activities as part of the project. Areas used for construction access and staging would not be paved or otherwise permanently altered. These areas are expected to provide habitat of similar quality to existing conditions shortly (i.e., in less than one year) after the completion of construction. Areas that would be temporarily impacted by grading would be revegetated following the completion of construction; such areas are expected to provide habitat of similar quality to the existing habitat that would be impacted, from the perspective of California red-legged frogs, within approximately one year after the completion of construction.

Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize impacts on individuals and their habitat during construction. Compensatory mitigation is proposed to mitigate for any permanent loss of the California red-legged frog dispersal or foraging habitat.

#### *Swainson's hawk*

The Build Alternative is not expected to result in impacts on high quality Swainson's hawk foraging habitat (e.g., open agricultural fields and pastures) due to the proximity of I-80. The BSA represents a very small fraction of the total foraging habitat available to this species in the region. No row crops and only 2.67 acres of non-native grasslands (i.e., potentially suitable foraging habitat) would be permanently impacted by the project. This represents less than 0.01 percent of the foraging habitat available within 10 miles of the nearest active nest. Therefore, the Build Alternative **is not expected** to reduce this species' populations or reproduction potential in any way, and any project impacts would be minimal. Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below would avoid take of, and impacts to, Swainson's hawks, including eggs and young. Therefore, no compensatory mitigation is required.

### **West Segment –Fundable First Phase**

Adverse effects to the protected species described above for the Build Alternative are applicable to West and East Segments. As previously discussed, the distribution of suitable habitat types within the BSA varies dependent on the characteristics and needs of the animal species. California red-legged frog habitat is only present within the West Segment of the Build Alternative. As such, the West Segment 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 East Segment.

### No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lanes 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 transportation 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.

### 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 was initiated with the submission of a Biological Assessment (BA) prepared for the project for the valley elderberry longhorn, Central Valley steelhead, Central California Coast steelhead, and California red-legged frog. A Biological Opinion (BO) was obtained from the USFWS on August 17, 2015.

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 one species listed under CESA: Swainson's hawk. However, with implementation of **Measure BIO-30**, an Incidental Take Permit (ITP) from the CDFW is not expected to be needed.

Caltrans also initiates consultation with the National Marine Fisheries Service (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 Central Valley steelhead and Central California Coast steelhead, federally listed anadromous fish, informal consultation with the NMFS was initiated in March 2015 with the submission of a BA prepared for the project. The NMFS agreed that because the project did not propose pile driving, there would be no likely impacts to the Central Valley steelhead and Central California Coast steelhead. Accordingly, NMFS agreed that under the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in

Caltrans' Districts 1, 2, and 4 issued to Caltrans by NOAA, the project is covered under Category 3. As such, no further opinion was needed.

## AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

### Build Alternative

#### *Biological Opinion*

The Biological Opinion describes measures that must be taken to avoid, minimize, or mitigate effects to federally listed species. **Measure BIO-32, 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

#### *Valley elderberry longhorn beetle*

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to the valley elderberry longhorn beetle during project construction. These measures include worker environmental training (**Measure BIO-3**), barrier fencing to protect habitat at specified buffer zones (**Measures BIO- 24 and BIO-25**), erosion control and re-vegetation of buffer zones (**Measure BIO-26**), use prohibition of harmful chemicals within specified distance of habitat (**Measure BIO-27**), and a dust control program (**Measure BIO-28**).

#### *Central valley steelhead and Central California coast steelhead*

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 HYDR-1 and WQ-2 and Section 2.3.7 Avoidance and Minimization Measures and Project Mitigation Measures**, below), 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 **Measure BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8** as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below include provisions on worker environmental training, construction to avoid takes, disturbances or injury of the Central valley steelhead and the Central California coast steelhead, habitat protection, and biological monitoring. The

project will also implement all applicable Additional BMPs (ABMPs) as specified in the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans' Districts 1, 2, and 4 (NOAA 2013).

*California red-legged frog*

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures**, will reduce the potential for effects to California red-legged frogs during project construction. These measures include biological monitoring worker environmental awareness training, pre-construction surveys, relocation plan, construction material and storage inspections, and exotic species control by a qualified biologist (**Measure BIO-28**).

Water quality during construction and project operation would be protected by BMPs and other measures that would be developed approved prior to construction (see **Section 2.2.2, Water Quality, Measures HYDR-1, WQ-1, BIO-1, and BIO-2**). Implementation of these measures 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-F: Compensatory Mitigation for the California Red-Legged Frog.** Caltrans will mitigate for any permanent loss of California red-legged frog dispersal or foraging habitat at a 3:1 ratio (mitigation : impact) and any temporary loss of dispersal and foraging habitat at a 1:1 ratio on an acreage basis, estimated at approximately 1.05 acres of habitat to be preserved. Compensatory mitigation may be carried out through purchasing credits at a habitat mitigation bank and/or one or both of the following methods, in order of preference:

- Establishment of a conservation easement for habitat used for California red-legged frog dispersal.
- Purchase of USFWS-approved banking credits for upland dispersal habitat.
- Provide funds to conservation group for aid and support of California red-legged frog conservation.

*Swainson's hawk*

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 the Swainson's hawk during project construction. These measures include timing of construction activities outside nesting periods, pre-construction surveys, disturbance free buffer zones, and biological monitoring (**Measure BIO-30**).

**West Segment - Fundable First Phase**

Avoidance, minimization, and mitigation measures described above for the Build Alternative are applicable to the East and West Segments. Certain impacts are more prevalent in the West Segment of the Build Alternative because of the distribution of suitable habitat for protected species. Where applicable, the avoidance and minimization measures specify the locations in which the measures should be applied (i.e., measures that dictate compensatory mitigation related to California red-legged frogs are thereby only applicable to West Segment of the project).

### 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 NES prepared for the project (Caltrans, 2014k). Several invasive plant species were observed within or adjacent to the BSA (**Table 2.3-6**). These species included understory invaders such ripgut brome and milk thistle, and shrub invaders such as Himalayan blackberry.

**Table 2.3-6 List of Invasive Plant Species Observed in the BSA and the California Invasive Plant Council Ratings.**

Common Name	Scientific Name	Rating*	Common Name	Scientific Name
Tree-of-heaven	<i>Ailanthus altissima</i>	Moderate	Tree-of-heaven	<i>Ailanthus altissima</i>
Giant reed	<i>Arundo donax</i>	High	Giant reed	<i>Arundo donax</i>
Black mustard	<i>Brassica nigra</i>	Moderate	Black mustard	<i>Brassica nigra</i>
Field mustard	<i>Brassica rapa</i>	Limited	Field mustard	<i>Brassica rapa</i>
Ripgut brome	<i>Bromus diandrus</i>	Moderate	Ripgut brome	<i>Bromus diandrus</i>
Soft chess	<i>Bromus hordeaceus</i>	Limited	Soft chess	<i>Bromus hordeaceus</i>
Red brome	<i>Bromus madritensis</i>	High	Red brome	<i>Bromus madritensis</i>

Common Name	Scientific Name	Rating*	Common Name	Scientific Name
Italian thistle	<i>Carduus pycnocephalus</i>	Moderate	Italian thistle	<i>Carduus pycnocephalus</i>
Highway iceplant	<i>Carpobrotus edulis</i>	High	Highway iceplant	<i>Carpobrotus edulis</i>
Yellow star-thistle	<i>Centaurea solstitialis</i>	High	Yellow star-thistle	<i>Centaurea solstitialis</i>
Squarrose knapweed	<i>Centaurea virgata</i> var. <i>squarrosa</i>	Moderate	Squarrose knapweed	<i>Centaurea virgata</i> var. <i>squarrosa</i>
Poison hemlock	<i>Conium maculatum</i>	Moderate	poison hemlock	<i>Conium maculatum</i>
Bull thistle	<i>Cirsium vulgare</i>	Moderate	Bull thistle	<i>Cirsium vulgare</i>
Pampasgrass	<i>Cortaderia jubata</i>	High	Pampasgrass	<i>Cortaderia jubata</i>
Silverleaf	<i>Cotoneaster pannosus</i>	Moderate	Silverleaf	<i>Cotoneaster pannosus</i>
Artichoke thistle	<i>Cynara cardunculus</i>	Moderate	Artichoke thistle	<i>Cynara cardunculus</i>
Bermuda grass	<i>Cynodon dactylon</i>	Moderate	Bermuda grass	<i>Cynodon dactylon</i>
Annual dogtail	<i>Cynosurus echinatus</i>	Moderate	Annual dogtail	<i>Cynosurus echinatus</i>

Source: Caltrans 2014k

## ENVIRONMENTAL CONSEQUENCES

### Build Alternative

The project is not expected to result in a substantial increase in invasive species within the BSA due to the limited disturbance that would occur outside of the highly disturbed areas of the I-80 corridor. However, some grading and temporary staging areas would be located within natural habitats adjacent to the freeway. Therefore, care must be taken to limit the effects of site disturbance. All areas temporarily disturbed by vegetation removal, grading, construction access, and bridge and road modifications would be seeded with a native seed mixture that would help prevent erosion and also would increase the amount of native species within the herbaceous layer of the existing habitats. Invasive species, particularly fast-growing herbaceous invaders, are often disturbance-adapted, and soil disturbance (an effect expected for this construction project) will often be followed by an invasion of the disturbed area by these species. However, areas that will be affected by project activities will be seeded and planted with native species. Therefore, project-related effects are not expected to cause an increase in invasive species populations within the BSA.



### West Segment

The minimal effects related to invasive species for the Build Alternative are applicable to the West Segment.

### No-Build Alternative

The No-Build Alternative will make no physical or operational improvements to I-80 or the connecting roadways within the BSA. Implementation of the currently planned and funded projects outside the BSA but within Solano 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.

### AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Project activities are not expected to cause an increase in invasive species populations within the study area, thus no avoidance measures or compensatory mitigation is warranted for this 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 be implemented during construction. These measures apply to all of the proposed improvements under the Build Alternative, including the East and West Segments. 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:** Orange construction barrier fencing will be installed to identify ESAs, including oak and riparian 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.

**Measure BIO-2:** The following Caltrans standard BMP's shall be implemented during construction to avoid or minimize impacts on aquatic habitats:

- All work within the banks of an active channel will be restricted to the dry season (June 1–October 15).
- Orange construction barrier fencing will be installed to identify environmentally sensitive areas (ESAs), including aquatic and wetland habitat, 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 removed only after completion of construction.
- Caltrans will implement BMPs as recommended or required by the State Water Quality Control Board to protect water quality. These measures will include, but are not limited to the following:
  - No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material will be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the U.S./State or aquatic habitat.
  - No equipment will be operated in the live stream channel.
  - Equipment staging and parking areas will occur within established access areas in upland habitat above the top of bank.
  - Machinery or vehicle refueling, washing, and maintenance will occur at least 60 feet from the top-of-bank. Equipment will be regularly maintained to prevent fluid leaks. Any leaks will be captured in containers until the equipment is moved to a repair location.

- A spill prevention and response plan will be prepared prior to construction and will be implemented immediately for cleanup of fluid or hazardous materials spills.
- Standard erosion control and slope stabilization measures will be required for work performed in any area where erosion could lead to sedimentation of a water body.
- Caltrans will provide a dewatering and diversion plan for agency approval as needed.

**Measure BIO-3.** A Worker Environmental Awareness Training (WEAT) program will be given by a qualified biologist before the onset of to explain to construction personnel how best to avoid the accidental take of steelhead and Chinook salmon and the valley elderberry longhorn beetle. The biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.

**Measure BIO-4.** All work within a low-flow channel associated with the construction of the Ulatis and Horse creek bridge modifications will occur during the dry season (June 1 to October 15). During this time, drainage flows in Ulatis and Horse creeks are expected to be at annual lows, and it is possible that the drainages may be completely dry; during this time, steelhead and Chinook are expected to be absent from the reaches of Ulatis and Horse creeks within the BSA.

**Measure BIO-5.** When work in a flowing stream is unavoidable and before work commences, any stream flow will be diverted around the work area by a barrier/cofferdam, temporary culvert, or a new channel capable of permitting upstream and downstream fish movement. The material used to construct the cofferdams will be clean material, contained, for example in sacks, and placed over plastic or filter fabric (or like material) so it can be completely removed from the streambed and preserve existing riverbed substrate. Construction of the barrier/cofferdam or the new channel will normally begin in the downstream area and continue in an upstream direction and the flow will be diverted only when construction of the diversion is completed.

**Measure BIO-6.** During construction activities that involve physical modification of any bridge over aquatic habitat, netting or other structures will be installed under the existing bridge to prevent debris from entering the channel, as such debris could degrade water quality downstream and potentially injure steelhead or Chinook salmon (e.g., when work on the bridge deck is occurring during the wet season).

**Measure BIO-7.** If flow is present in the drainage when in-water construction is scheduled to occur, a qualified biologist will be present to monitor all activities involving the placement of fill in the drainage, including any cofferdam construction. The biologist will inspect the area where the cofferdam will be constructed prior to construction and will ensure that any fish have vacated the cofferdam area before in-water work begins. A water diversion plan will be developed and submitted to resource agencies prior to construction start. Once all fish have moved out of the work area, the cofferdam will be completed so that fish cannot re-enter this area.

**Measure BIO-8.** If at any time an individual steelhead or Chinook salmon appears to be at risk of injury or mortality due to project-related activities, all work will stop until Caltrans has consulted with NMFS to determine a means of avoiding impacts on the individual(s).

**Measure BIO-9.** In order to avoid and minimize project impacts on badgers, a qualified mammalogist will conduct pre-construction surveys for badger dens non-native annual grassland throughout the BSA, within two weeks prior to groundbreaking. Because badger dens, if present, are most likely to occur in open grassland and ruderal habitats, this survey could be conducted in conjunction with the preconstruction survey for burrowing owls.

**Measure BIO-10.** If an active badger maternity den is located, the mammalogist will determine the size of a construction-free buffer that will be maintained around the den to avoid impacts on the den during the pupping season (i.e., February 15 through July 1, or as otherwise determined through surveys and monitoring of the den), in consultation with the CDFW.

**Measure BIO-11.** If an active den is found outside of the pupping season, the badger will be evicted by excavation of the den using hand tools, in consultation with the CDFW and under the supervision of a qualified biologist. These precautionary measures will ensure that no active pupping dens are impacted by the project.

**Measure BIO-12.** A qualified biologist will conduct a pre-construction survey for western pond turtles and their nests. If a western pond turtle is found in an area where it could be injured or killed by project activities, the qualified biologist will relocate the turtle to an appropriate site outside the project area.

**Measure BIO-13.** If an active western pond turtle nest is detected within the activity area, a 25-foot buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31). The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist.

**Measure BIO-14.** Following the initial survey, a qualified biologist will conduct a survey of the aquatic habitat within the activity area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity will immediately cease, and a qualified biologist will be contacted. Work within the area will not resume until the turtle has been relocated or has moved out of the area where it could be impacted.

**Measure BIO-15.** Work within 100 feet of bridges/crossings identified in Table 9 of Caltrans 2014i as providing suitable bat day roosting habitat (i.e., Laguna Creek Bridge and Soda Springs Culvert) will be avoided during the maternity season (April 1 through July 31) to the extent feasible. Outside of the maternity season, when construction activities will occur within 100 feet of the roost, the bats may be habituated enough to noise and vibration that they may tolerate the work activities and not abandon the roost. Those bats that cannot tolerate this disturbance are expected to leave the roost, dispersing to other roost habitat in the vicinity (e.g., other bridges). However, based on the bats' obvious habituation to noise and vibrations associated with existing traffic, impacts on the colony will be lower if the bats are allowed to decide whether to abandon based on their own level of tolerance than if the bats are evicted prior to work, which is assured of causing the abandonment of the entire colony. As a result, no eviction of bats is proposed for work conducted outside of the maternity season. Performing work outside of the maternity season will ensure that no non-flying young are abandoned or harmed during work activities. Further, in case the bats do disperse from the bridge when work commences, all work activities involving jackhammering within 100 feet of the roost will commence in the evening, after sunset, in order to minimize the risk of predation of bats leaving the roost. If work within 100 feet of potential day roosts sites during the maternity season cannot be avoided, the following measures will be implemented.

**Measure BIO-16.** If jackhammering or other ground-disturbing activities will occur on the freeway immediately above a potential day roost, bats will be safely evicted from the potential roost site under the direction of a qualified bat biologist. Eviction activities will be performed prior to the breeding season (i.e. April 1) in the year in which project activities are scheduled to occur. Eviction of bats will occur at night to decrease the likelihood of predation (compared to eviction during the day). Evictions will occur between September 1 and March 32, outside the maternity season, but will not occur during long periods of inclement or cold weather (as determined by the bat biologist) when prey are not available or bats are in torpor. Following eviction, bat exclusion devices will be installed to prevent bats from taking up occupancy of the structure prior to the onset of the proposed activity.

**Measure BIO-17.** If jackhammering or other ground-disturbing activities will not occur on the freeway immediately above the roost but will occur within 100 feet of the roost, a qualified bat biologist will determine whether the bats will be evicted, using the methods outlined in **BIO-15** and **BIO-16**, on a case-by-case basis depending on the level of disturbance that is proposed.

**Measure BIO-18.** Pre-construction surveys for burrowing owls will be conducted in potential habitat in conformance with the CDFW's 2012 protocol (CDFW 2012).

**Measure BIO-19.** If burrowing owls are present during the nonbreeding season, (generally 1 September 1 to January 31), the approved biologist will establish a protective buffer zone in coordination with resource agencies. During the breeding season (generally 1 February 1 to August 31), a 250-foot buffer, within which no new project-related activities will be permissible, will be maintained between project activities and occupied nests. Owls present

between February 1 and August 31 will be assumed to be nesting unless monitoring evidence indicates that the owls are no longer nesting, or the young owls are foraging independently, or only a single owl (rather than a breeding pair) is present after 1 July and there is no evidence that young owls are present, in which case the buffer may be reduced or the owls may be relocated prior to August 31, in consultation with the CDFW.

**Measure BIO-20.** If construction will directly impact occupied burrows, eviction of owls will occur in coordination with the regulatory agencies.

**Measure BIO-21.** If vegetation is to be removed by the project, potential nesting substrate (e.g., bushes, trees, snags, grass, and suitable artificial surfaces) that will be disturbed should be removed during the nonbreeding season (i.e., they should be removed between September 1 and February 14), if feasible, to help preclude nesting. If it is not feasible to schedule vegetation removal during the nonbreeding season, then pre-construction surveys for nesting birds will be conducted by a qualified biologist to ensure that no nests will be disturbed during project implementation. This survey will be conducted no more than seven days prior to the initiation of construction activities. During this survey, the ornithologist will inspect all trees, shrubs, and other potential nesting habitats in and immediately adjacent to the BSA for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the biologist, in consultation with the CDFW, will determine the extent of a buffer zone to be established around the nest, typically 300 feet for raptors and 50 feet for other birds, to ensure that no nests of species protected by the MBTA or the California Fish and Game Code will be disturbed during project implementation.

**Measure BIO-22.** Alternatively, nest starts may be removed on a regular basis (e.g., every second or third day), starting in late January or early February, or measures such as exclusion netting may be placed over the existing bridges to prevent active nests (i.e., nests with eggs or young) from becoming established. Netting needs to be installed by an experienced deterrence contractor and be well maintained to prevent entanglement or entrapment of birds.

**Measure BIO-23.** Because the entire BSA is already subject to disturbance by vehicles, activities that will be prohibited from occurring within the buffer zone around a nest will be determined on a case-by-case basis. In general, activities prohibited within such a buffer while a nest is active will be limited to new construction-related activities (i.e., activities that were not ongoing when the nest was constructed) involving significantly greater noise, human presence, or vibrations than were present prior to nest initiation.

**Measure BIO-24.** Before any ground-disturbing activity, orange construction barrier fencing will be installed to identify ESAs, including elderberry shrubs, present within the BSA but that are to be avoided (i.e., no ground disturbance activities will occur within 20 feet of the two shrubs present within 100 feet of project impact areas) by project activities. The fencing will be installed at least 20 feet from the driplines of all elderberry shrubs on which direct impacts will be completely avoided. 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.

**Measure BIO-25.** 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.

**Measure BIO-26.** Any damage to the buffer area during construction will be restored following construction. Restoration will include erosion control and re-vegetation with native plants as appropriate.

**Measure BIO-27.** No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.

**Measure BIO-28.** Caltrans will include provisions in the construction bid documents that the contractor will implement a dust control program to limit fugitive dust emissions. The dust control program may include, but not be limited, to the following elements, as appropriate:

- Water active construction sites at least twice daily.
- Pursuant to California Vehicle Code, Section 23114 (State of California 2004), all trucks hauling soil and other loose material to and from the construction site will be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of load and the trailer).
- Exposed stockpiles of soil and other backfill material will be enclosed or covered, and watered twice daily or have soil binders added.
- Any topsoil that is removed for the construction operation will be stored on-site in piles not to exceed 4 feet in height. These topsoil piles will be clearly marked and flagged. Topsoil piles that will not be immediately returned to use will be revegetated with a non-persistent erosion control mixture.

**Measure BIO-29.** Caltrans will submit to the USFWS the name(s) and credentials of biologists who would conduct activities related to the California red-legged frog specified in the following measures:

- A WEAT program will be given by an approved biologist before the onset of construction within potential California red-legged frog habitat to explain to construction personnel how best to avoid the accidental take of red-legged frogs. The

biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.

- Prior to the initiation of the pre-construction survey, a relocation plan for any California red-legged frogs found on the project site will be submitted to the USFWS for approval.
- The approved biologist will perform pre-construction surveys.
- A USFWS-approved biologist will be present at all times during initial disturbance of potential red-legged frog habitat to monitor for red-legged frogs.
- All construction pipes, culverts, or similar structures that are stored at the site within suitable red-legged frog habitat for one or more overnight periods will be either securely capped prior to storage or thoroughly inspected by the approved biologist or on-site monitor before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a California red-legged frog is discovered inside a pipe, the approved biologist will move the animal to an approved location, as described above.
- During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
- A qualified biologist will permanently remove any individuals of exotic species.

**Measure BIO-30.** If construction-related work is conducted outside the nesting period (February 1 through August 31), potential impacts on active nests of Swainson's hawks will be avoided. If it is not feasible to schedule construction during the nonbreeding season, the following measures will be implemented.

- A pre-construction survey for nesting Swainson's hawks within 0.25 miles of the BSA will be conducted within 15 days prior to the initiation of construction activities; this survey will be conducted by a qualified biologist. If an active Swainson's hawk nest is detected, the following measure will be implemented.
  - To reduce the potential for Swainson's hawks to abandon their nest or territory due to construction disturbance during their reproductive period, if nesting Swainson's hawks are present, a buffer free from new disturbance will be established within a 600-foot radius of the nest. No new project-related activities (i.e., activities that were not already ongoing when the nest was established, or that are of a substantially greater intensity than when the nest was established)



will be undertaken within the buffer. In some cases (e.g., if the construction is not visible from the nest site), it is possible that a lesser buffer would be adequate to avoid disturbance of the nesting Swainson's hawks, but such a variance would require approval of the CDFW. In such a case, the biologist and agency personnel will agree on a reduced buffer, and the biologist will monitor the behavior of the nesting birds during the two days immediately prior to the onset of construction activities within 0.25 miles of the nest to establish a behavioral baseline. The biologist will also monitor the behavior of the nesting birds during the first full day of construction activity within 0.25 miles of the nest. The biologist will look for signs of stress such as repeated alarm calls, agitated behavior, or departure of the birds from the nest. If the birds do not show signs of habituation to the new disturbance by resuming their normal nesting activities, work within the vicinity of the nest will stop and the CDFW will be consulted to refine the buffer determination. If the birds continue their normal activities, the biologist will inspect the nest site every one to two days (the frequency determined in consultation with the CDFW) for as long as the nest is active and work is ongoing within the reduced buffer to confirm that the birds are tolerant of the construction activities. Any required buffer will remain in place until young are no longer dependent on the nest, or until the nesting attempt fails (for reasons other than project activities) and it is determined that the birds will not attempt to re-nest. A qualified biologist will determine through direct observation when the nest is no longer in use (e.g., if the young have fledged or the nesting fails for non-project-related reasons). Constant monitoring of the nest is not necessary, but before construction activities occur within the agreed-upon buffer, the biologist must have confirmed that the nest is no longer active.

**Measure BIO-31.** 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-32:** 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.

## MITIGATION MEASURES

Compensatory mitigation as described below will minimize adverse effects to natural communities, wetlands and other waters, animal species, and threatened and endangered species to a negligible level. A portion of the overall mitigation acreage requirements 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 Oak Woodlands Replacement.**

Compensation for impacts to 1.35 acres of oak woodland habitat will be mitigated at a replacement ratio of 2:1 within the BSA and, if needed, outside the BSA. An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. If the replacement of oak woodland habitat cannot be implemented within the BSA, or there is not a sufficient area to mitigate oak woodland tree and shrub impacts, as determined by Caltrans, acreage for oak woodland plantings will be acquired within the vicinity of the project.

### **Mitigation Measure BIO-B: Compensatory Mitigation for Oak Woodlands Habitat**

**Mitigation and Monitoring Plan.** Prior to issuance of a grading permit, Caltrans will prepare an Oak Woodland Habitat Mitigation & Monitoring Plan (HMMP) for oak woodland habitat creation. An open space or conservation easement, or other similar instrument, will be recorded on property associated with the mitigation lands to protect the created habitats' plant and wildlife resources in perpetuity. The Oak Woodland HMMP will be prepared by a qualified restoration ecologist and will provide, at a minimum, the following items:

- Habitat impacts summary and proposed habitat mitigation actions
- Goals of the restoration to achieve no net loss
- The location of the mitigation sites and existing site conditions
- Mitigation design including:
  - Proposed site construction schedule

- Description of existing and proposed soils, hydrology, geomorphology and geotechnical stability
- Site preparation and grading plan
- Invasive species eradication plan, if applicable
- Soil amendments and other site preparation
- Planting plan (plant procurement/propagation/installation)
- Maintenance plan
- Monitoring measures, performance and success criteria
- Monitoring methods, duration, and schedule
- Contingency measures and remedial actions
- Reporting measures

**Mitigation Measure BIO-C: Compensatory Mitigation for Aquatic and Wetland Restoration.** Compensation for permanent impacts up to 0.17 acre of aquatic and wetland habitat will be mitigated at a replacement ratio of 1:1 (created wetlands: impacted wetlands) based on square footage offsite . These effects may be mitigated at a USACE-approved wetland mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turn-key mitigation property located in close proximity to the project, such as Grizzly Bay Preserve. Temporary impacts on 1.23 acre of aquatic habitat (i.e. impacted areas not previously mitigated) will be mitigated on-site by restoring impacted areas to pre-project conditions.

**Mitigation Measure BIO-D: Compensatory Mitigation for Riparian Woodland Replacement.** Compensation for permanent impacts to up to 0.03 acre of riparian habitat will be mitigated at a replacement ratio of 3:1 (habitat replaced: habitat lost) based on acreage offsite . These effects may be mitigated at a CDFW-approved riparian mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turnkey mitigation property located in close proximity to the project, such as Grizzly Bay Preserve.

**Mitigation Measure BIO-E: Compensatory Mitigation for the Burrowing Owl.** Compensatory mitigation will be provided in the form of habitat preservation and/or management if burrowing owls are located in the BSA during pre-construction surveys. The loss of foraging and nesting habitat in the project construction area will be offset by acquiring and permanently protecting suitable foraging and breeding habitat.

**Mitigation Measure BIO-F: Compensatory Mitigation for the California Red-Legged Frog.** Caltrans will mitigate for any permanent loss of California red-legged frog dispersal or foraging habitat at a 3:1 ratio (mitigation : impact) and any temporary loss of dispersal and foraging habitat at a 1:1 ratio on an acreage basis, estimated at approximately 1.05 acre of

habitat to be preserved. Compensatory mitigation may be carried out through purchasing credits at a habitat mitigation bank and/or one or both of the following methods, in order of preference:

- Establishment of a conservation easement for habitat used for California red-legged frog dispersal.
- Purchase of USFWS-approved banking credits for upland dispersal habitat.
- Provide funds to conservation group for aid and support of California red-legged frog conservation.

Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

## 2.4 CUMULATIVE IMPACTS

### 2.4.1 REGULATORY SETTING

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this proposed project. A cumulative effect assessment looks at the collective impacts posed by land use plans and individual 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.

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 Council on Environmental Quality (CEQ) Regulations.

### 2.4.2 CUMULATIVE IMPACTS

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 I-80 freeway within the project limits would occur as a result of project implementation. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lane 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 Vacaville General Plan and City of Fairfield General Plan and associated EIRs. Where indicated, the cumulative analysis is enhanced through the consideration of specific individual projects identified from a list compiled from both the Cities of Vacaville and Fairfield.

As discussed in **Section 2.1.1, Land Use**, the predominant type of planned land use development in the area is residential. Other development projects planned in the area include commercial and industrial land uses (see **Table 2.4-1**). **Figures 2.4-1a and 2.4-1b** depict the locations of the other planned projects listed in **Table 2.4-1**. The following planned and approved transportation improvements along local routes may be implemented by local agencies:

- **The I-80/I-680/SR 12 Interchange Project , Initial Construction Package.** Realignment of westbound I-80 from east of the I-80/I-680 Interchange to SR 12 West connector, relocation of the Green Valley Road IC to the east and reconfiguration of the SR 12 West ramps and Green Valley Road on-ramp, occurring from 0.7 mile west on SR 12 West to SR 12 West/I-80 and on westbound I-80 from SR 12 West/I-80 to I-80/I-680.
- **Freeway Performance Initiative – I-80 Ramp Metering.** Installation of ramp metering equipment, traffic operating systems, metal beam guardrail, sign structures, and widen ramp along I-80 in Solano County within the cities of Vallejo, Fairfield, and Vacaville from the Contra Costa County line to I-505.
- **Alamo Creek Bridge Widening Project.** Bridge widening and construction drainage on I-80 in Solano County, in and near Vacaville.
- **Local Roadway Widening.** Local roadway widening at Peabody Road, Leisure Town Road, and Foxboro Parkway.
- **Roadway Extensions.** Roadway extensions at Railroad Avenue and Manuel Campos Parkway.
- **Capitol Corridor Station.** A new rail transit station at the Capitol Corridor Station.

Cumulative traffic forecasts were based on applications of the Solano-Napa Travel Demand Forecasting Model, with some calibration adjustments. The model provides future-year forecasts of traffic volumes for the AM and PM peak hours, based on changes to the land use and changes to the transportation network. 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.

## 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 & recreation, forestry resources, mineral resources, traffic and transportation/pedestrian improvements, and energy conservation were evaluated but found to have no adverse effect. Refer to **Section 2.1, Human Environment** and **Table 2-1** for a more detailed description of these resource areas.

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.

## ISSUES WITH THE POTENTIAL TO CONTRIBUTE TO THE CUMULATIVE EFFECT

### Community Impacts

The cumulative setting for community impacts includes the 36 block groups immediately surrounding the project limits. Urbanization in the cities of Fairfield and Vacaville influenced development and growth in the area. These areas continue to be diverse communities, representing many races and ethnicities. As discussed in **Section 2.1.5, Community Impacts**, the minority population within the study area represents 54 percent of the community and approximately 6.3 percent of the study area living below the poverty level. These populations are considered environmental justice communities.

Because approximately half of the communities surrounding the project limits are environmental justice communities, the adverse effects from the approved and foreseeable development combined in these areas could have a disproportionate and cumulative effect on low income or minority populations.

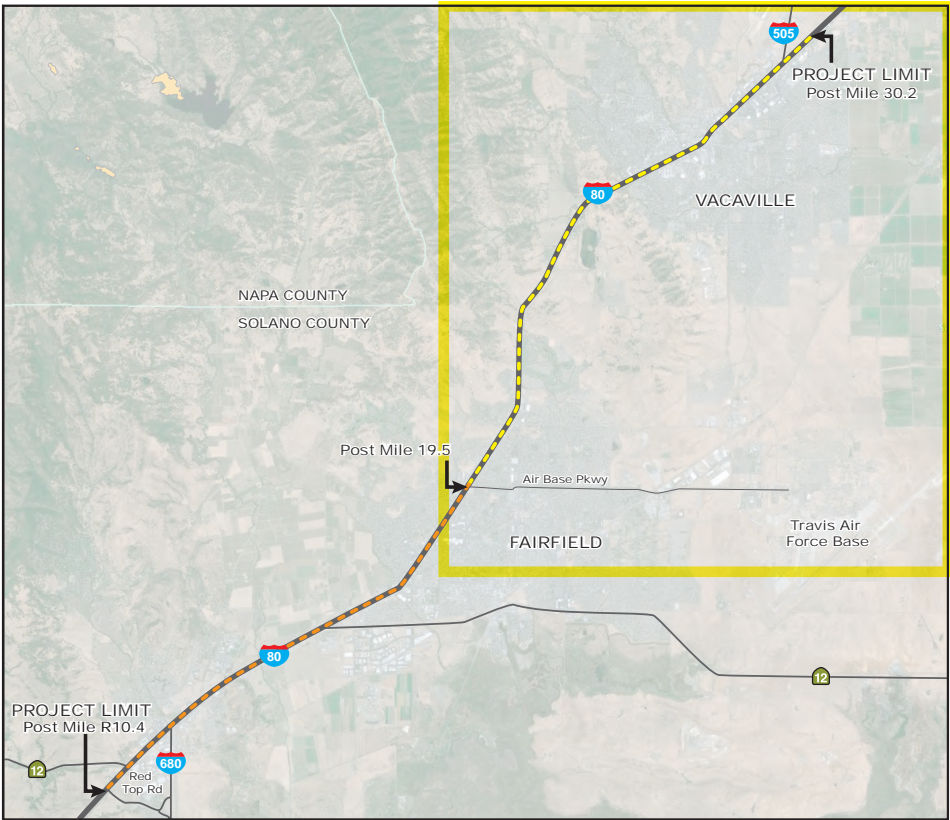
Implementation of the Build Alternative would affect private and public properties listed in **Section 2.1.5, Community Impacts** (see **Table 2.1-12** and **Table 2.1-13**). None of the proposed property acquisitions, construction easements, or utility easements are in areas where there are existing structures or improvements. The remaining portions of these parcels would remain in private ownership. The effects of the Build Alternative would be borne across a wide range of communities including both environmental justice and non-environmental justice communities. 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. As such, 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-80 corridor, within the project limits. As discussed in **Section 2.1.3, Growth**, population, housing, and employment within the study area have been increasing at a stable rate for the last several years. Such growth rates are expected to continue as per many proposed residential, commercial, and industrial developments proposed within the area (**Table 2.4-1**), which is a cumulative growth effect. Furthermore, the Association of Bay Area Governments (ABAG) projects the employment rate within the study area to increase 36 to 38 percent by 2040. Growth for the surrounding communities is planned for under the applicable general plans (Solano County, Fairfield, and Vacaville).

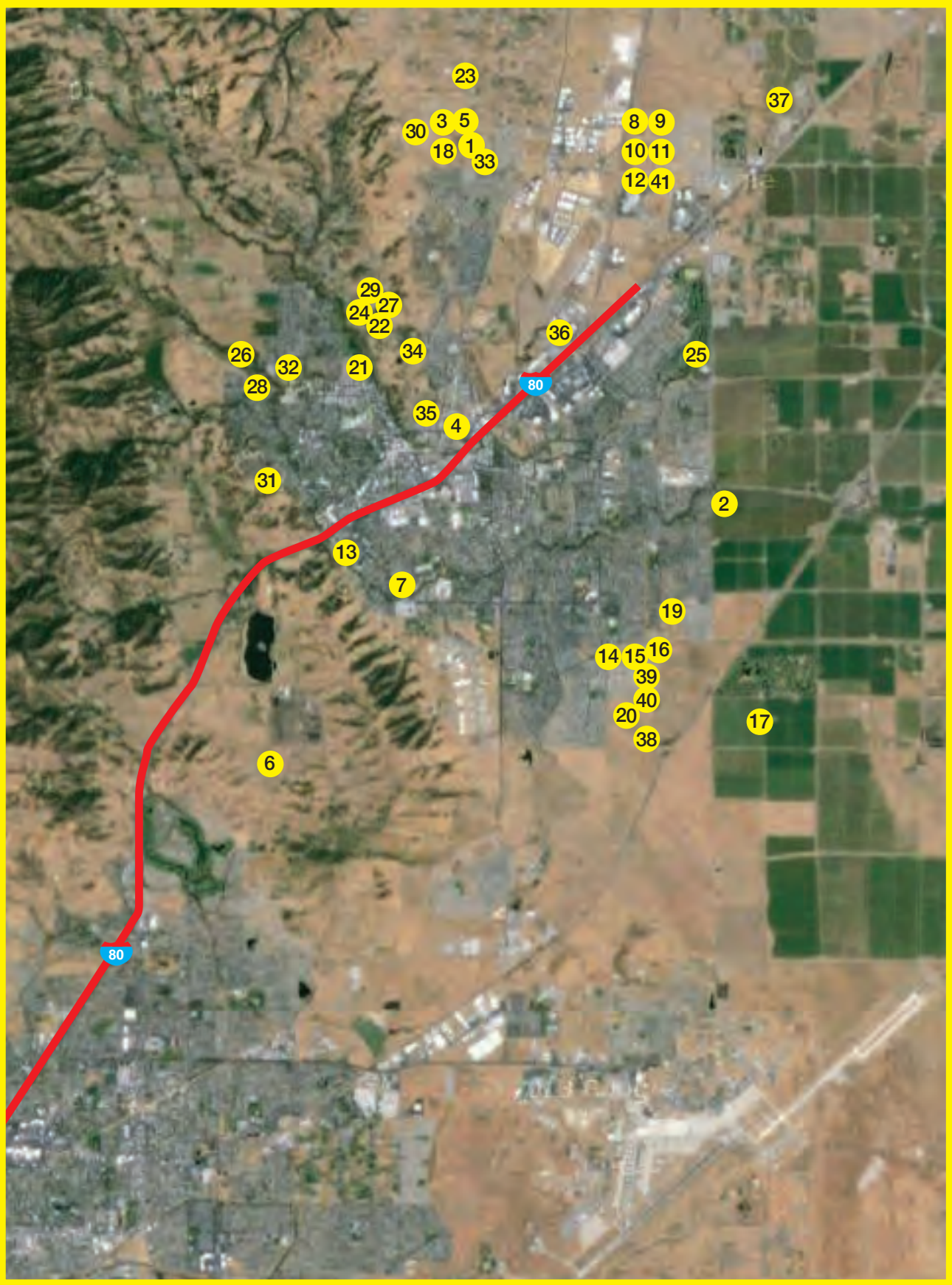
The Build Alternative does not propose any changes to zoning or land use designations within the I-80 corridor. While the Build Alternative would improve access and highway capacity, no new on- or off-ramps to the local roadways would be constructed. Existing access points to the areas surrounding the project limits would remain the same, with the exception of the existing eastbound Travis Boulevard off-ramp being modified into two separate off-ramps to accommodate increased weaving length for the auxiliary lane extension. For these reasons, the Build Alternative would not affect the rate, amount, or type of growth envisioned in the local planning documents and future planned developments in the area. Cumulative effects to growth are not anticipated.





**Legend**

- Project Study Limits
- R - Residential Development

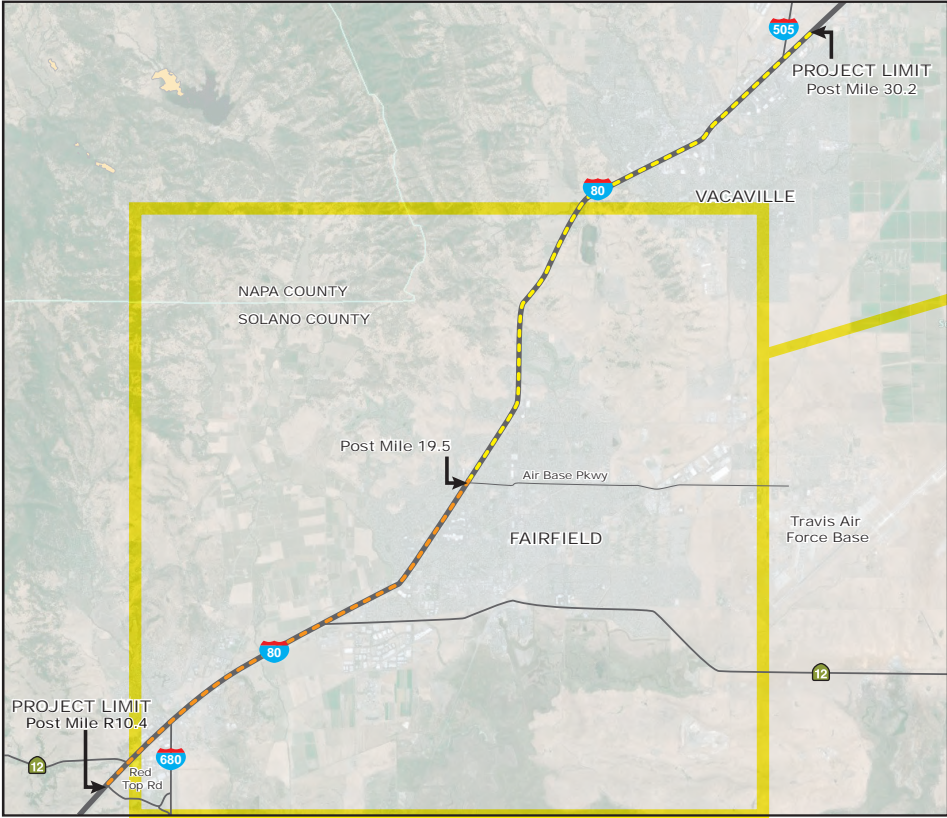


**VACAVILLE PROJECTS**

- 1 Amber Hills (R)
- 2 Brighton Landing (R)
- 3 Cheyenne (R)
- 4 Ivywood (R)
- 5 Knoll Creek (R)
- 6 Lagoon Valley (R)
- 7 Montessa (R)
- 8 Renaissance at North Village (R)
- 9 Casa Bella at North Village (R)
- 10 Sanctuary at North Village (R)
- 11 North Village Unit 5 (R)
- 12 North Village Unit 6 (R)
- 13 Portofino Unit 2 (R)
- 14 Barrington Estates at Southtown (R)
- 15 Carrington Manor at Southtown (R)
- 16 Southtown Phase 3 (R)
- 17 Southtown Commons (R)
- 18 Rancho Rogelio (R)
- 19 Sterling Chateau 4 (R)
- 20 Vanden Meadows (R)
- 21 Arroyo Vista (R)
- 22 Canyon View (R)
- 23 Cheyenne Estates (R)
- 24 Gibson/Vine Estates (R)
- 25 Golf Course Estates (R)
- 26 Hidden Valley (R)
- 27 Horkey Parcel Map (R)
- 28 Nob Hill Estates (R)
- 29 North Vine Street Estates (R)
- 30 Rogers Ranch (R)
- 31 Spring Lane Unit 2 (R)
- 32 Stratton Estates (R)
- 33 Verona (R)
- 34 Villages on Vine Unit 2 (R)
- 35 Vine Glen Estates (R)
- 36 Nut Tree Apartments (R)
- 37 Quinn Crossing Apartments (R)
- 38 Southtown Apartments (R)
- 39 Southtown Townhouses (R)
- 40 Vanden Meadows Apartments (R)
- 41 Villas at North Village Apartments (R)

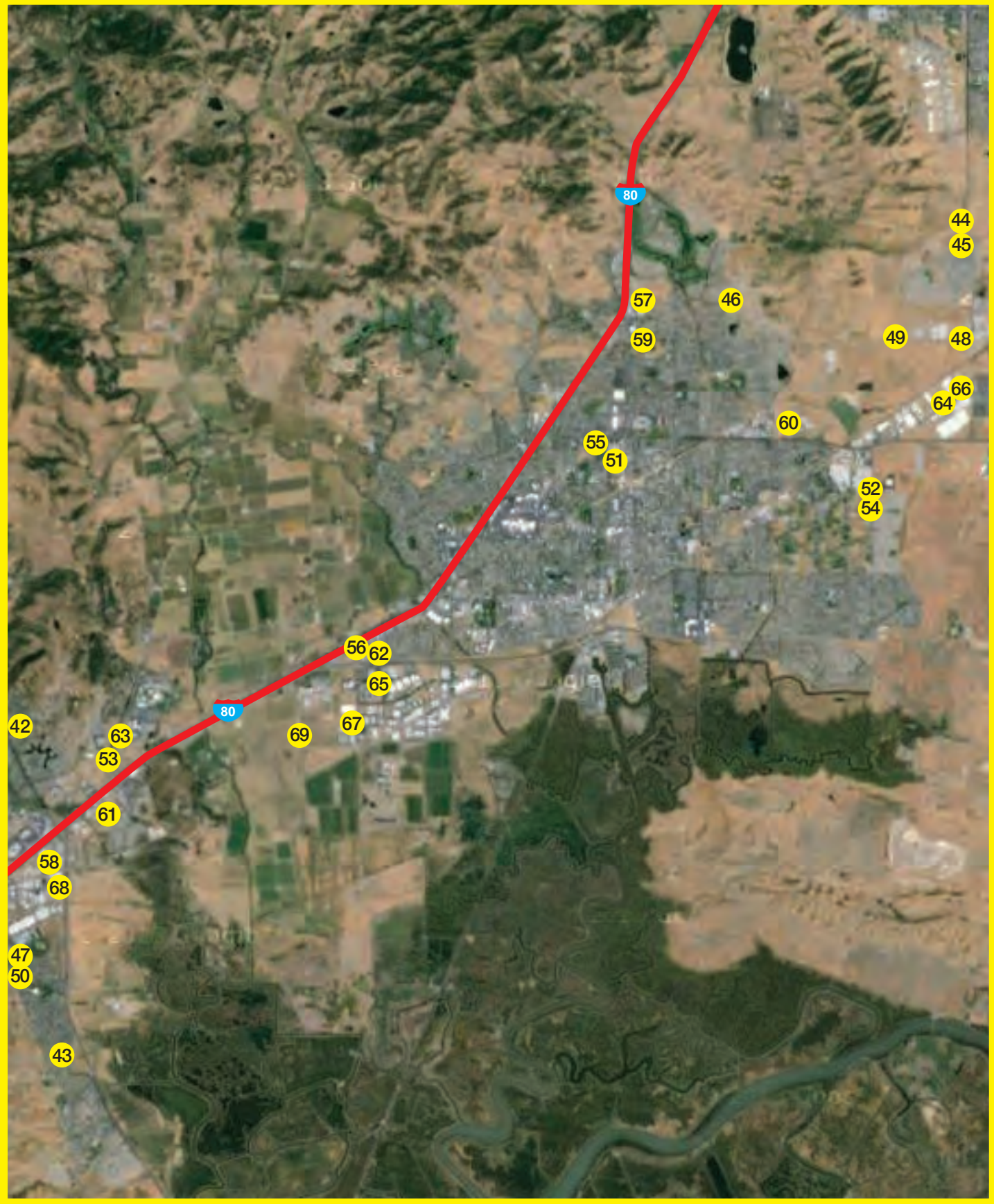
(back of Figure 2.4-1a)





**Legend**

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



**FAIRFIELD PROJECTS**

- 42 East Ridge (R)
- 43 Garibaldi Ranch (R)
- 44 Goldridge (R)
- 45 Madison (R)
- 46 Paradise Crest (R)
- 47 Fieldcrest (R)
- 48 Train Station Specific Plan Area (R)
- 49 Villages at Fairfield (R)
- 50 Villas at Havenhill (R)
- 51 Franklin-Tabor (R)
- 52 Ivy Wreath (R)
- 53 Paesino Verde (R)
- 54 Strawberry Fields (R)
- 55 The Cottages (R)
- 56 Mercedes Benz (C)
- 57 Lowes (C)
- 58 Premium Auto Mall (C)
- 59 Sparkles Express Car Wash (C)
- 60 Laurel Creek Plaza (C)
- 61 Green Valley Ranch (C)
- 62 CarMax (C)
- 63 Green Valley Plaza (C)
- 64 Frank Lin Distillers (I)
- 65 Verizon MSC (I)
- 66 Clorox Tank Farm 1 & 2 (I)
- 67 Lincoln Cordelia Road (I)
- 68 Lopes-Fermi Industrial Flex Building (I)
- 69 JCM Industrial Park (I)

(back of Figure 2.4-1b)

**Table 2.4-1 Planned Developments**

<b>Name</b>	<b>Location</b>	<b>Acres</b>	<b>Units</b>	<b>Proposed Use</b>	<b>Status</b>
Amber Hills	6928,6932,6950,6964 Browns Valley Road Vacaville	19.1	38	Residential	Tentative Map
Brighton Landing	SE of Elmira Road & Leisure Town Road Vacaville	125	769	Residential	Under Review
Cheyenne	Whispering Ridge Drive & W of Browns Valley Road & N of McMurty Lane Vacaville	86	221	Residential	Partially Constructed
Ivywood	201 Beard Street Vacaville	5.9	37	Residential	Partially Constructed
Knoll Creek	W. of Browns Valley Road & Whispering Ridge Drive Vacaville	10	38	Residential	Approved
Lagoon Valley	E. of I-80; S. of Lagoon Valley Road Vacaville	412	1025	Residential	Tentative Map
Montessa	1222 California Drive Vacaville	40	55	Residential	Tentative Map
Renaissance at North Village	Crescent Drive & North Village Parkway Vacaville	19.8	192	Residential	Under Construction
Casa Bella at North Village	Crescent Drive & North Village Parkway Vacaville	2.9	35	Residential	Under Construction



Name	Location	Acres	Units	Proposed Use	Status
Sanctuary at North Village	Crescent Drive & North Village Parkway Vacaville	13.4	162	Residential	Under Construction
North Village Unit 5	Crescent Drive & North Village Parkway Vacaville	11	68	Residential	Under Review
North Village Unit 6	W. of North Village Parkway Vacaville	134.9	176	Residential	Under Review
Portofino Unit 2	S. of Tucia Avenue & Butcher Road Vacaville	1.26	7	Residential	Tentative Map
Barrington Estates at Southtown	E. of Nut Tree; S. of Somerville Drive Vacaville	43.7	165	Residential	Partially Constructed
Carrington Manor at Southtown	E. of Nut Tree; S. of Somerville Drive	41.9	158	Residential	Partially Constructed
Southtown Phase 3	5709 Vanden Road Vacaville	47.9	37	Residential	Tentative Map
Southtown Commons	E. Side Leisure Town Road; & Cypresswood Drive Vacaville	39.4	215	Residential	Tentative Map
Rancho Rogelio	7019 Browns Valley Road Vacaville	20.9	40	Residential	Tentative Map
Sterling Chateau 4	SE Corner Alamo Vanden Road Vacaville	13.7	54	Residential	Tentative Map
Vanden Meadows	E. of Nut Tree Rd.; S. of Opal Way Vacaville	206	939	Residential	Under Review

Name	Location	Acres	Units	Proposed Use	Status
Arroyo Vista	SW Corner of Fruitvale Road & Gibson Canyon Road Vacaville	3.87	8	Residential	Tentative Map
Canyon View	Gibson Canyon Road & Vine Court Vacaville	14.08	15	Residential	Approved Vesting
Cheyenne Estates	NW of Shelton Lane Vacaville	15	15	Residential	Approved Final Map
Gibson/Vine Estates	SE Corner of Gibson Canyon Road/Vine Street Vacaville	9.01	8	Residential	Approved Vesting
Golf Course Estates	White Sands Drive & Whitney Court Vacaville	16.8	3	Residential	Recorded Final Map
Hidden Valley	N. Alamo Drive & Hidden Valley Lane Vacaville	25.5	31	Residential	Recorded Final Map
Horkey Parcel Map	385 Vine Street Vacaville	3.5	2	Residential	Tentative Map
Nob Hill Estates	End of Seneca Way Vacaville	12.17	9	Residential	Approved Final Map
North Vine Street Estates	N. end of Vine St.; E. of Gibson Canyon Road Vacaville	60.4	58	Residential	Approved Final Map
Rogers Ranch	N. of McMurtry Lane & Grace Feather Court Vacaville	35	28	Residential	Vesting Tentative Map
Spring Lane Unit 2	Spring Lane & Monte Verde Drive Vacaville	52.85	27	Residential	Tentative Map

Name	Location	Acres	Units	Proposed Use	Status
Stratton Estates	607 Shady Glen Road Vacaville	4	10	Residential	Partially Constructed
Verona	190 Rice Lane Vacaville	4.72	4	Residential	Tentative Map
Villages on Vine Unit 2	E. of Vine Street & Gibson Canyon Road Vacaville	12.9	25	Residential	Under Construction
Vine Glen Estates	Bresee Ave/Vine Street Vacaville	6.3	19	Residential	Tentative Map
Nut Tree Apartments	Nut Tree Road & E Monte Vista Ave Vacaville	12	216	Residential	Approved
Quinn Crossing Apartments	9999 Quinn Road Vacaville	17.3	312	Residential	Pending Submittal
Southtown Apartments	W. of Leisure Town Road & Vanden Road Vacaville	10.7	223	Residential	Tentative Map
Southtown Townhouses	W. Side Vanden Road & Cogburn Circle Vacaville	6.3	60	Residential	Tentative Map
Vanden Meadows Apartments	W. of Vanden Road; N. of Newcastle Drive Vacaville	8.17	60	Residential	Approved Planned Development
Villas at North Village Apartments	North Village Parkway & Crescent Drive Vacaville	9.9	228	Residential	Approved
Eastridge	Green Valley Road & Eastridge Drive Fairfield	N/A	217	Residential	Active



Name	Location	Acres	Units	Proposed Use	Status
Garibaldi Ranch	Lopes Road & Gold Hill Road Fairfield	N/A	520	Residential	Active
Gold Ridge	Peabody Road & Chuck Hammond Drive Fairfield	N/A	1458	Residential	Active
Madison	Peabody Road & Gramercy Circle Fairfield	N/A	221	Residential	Active
Paradise Crest	Manuel Campos Parkway & Mystic Drive Fairfield	N/A	150	Residential	Active
Fieldcrest	Red Top Road & Oakbrook Drive Fairfield	N/A	384	Residential	Future
Train Station Specific Plan Area	Peabody Road & Cement Hill Road Fairfield	N/A	N/A	Residential	Future
Villages at Fairfield	Cement Hill Road & Walters Road Fairfield	N/A	1717-2159	Residential	Future
Villas at Havenhill	Red Top Road & Oakbrook Drive Fairfield	N/A	324	Residential	Future
Franklin-Tabor	Tabor Avenue & Pacific Avenue Fairfield	N/A	23	Residential	Inactive
Ivy Wreath	East Tabor Avenue & Walters Road Fairfield	N/A	73	Residential	Inactive

Name	Location	Acres	Units	Proposed Use	Status
Paesino Verde	Business Center Drive & Suisun Valley Road Fairfield	N/A	284	Residential	Inactive
Strawberry Fields	East Tabor Avenue & Walters Road Fairfield	N/A	39	Residential	Inactive
The Cottages	Union Avenue & Peach Tree Drive Fairfield	N/A	45	Residential	Inactive
Mercedes Benz	2950 Auto Mall Fairfield	77,914 square feet		Commercial	Under Construction
Lowes	N. Texas at Manuel Campos Fairfield	139,000 square feet		Commercial	Under Construction
Premium Auto Mall	Auto Plaza Court Fairfield	10,000 +/- square feet		Commercial	Under Construction
Sparkles Express Car Wash	3103 N. Texas Fairfield	3,000 square feet		Commercial	Approved
Laurel Creek Plaza	Air Base at Claybank Fairfield	110,186 square feet		Commercial	Approved
Green Valley Ranch	4455 Central Fairfield	N/A		Commercial	Future Phase
CarMax	2901/2955 Auto Mall Parkway Fairfield	64,000 square feet		Commercial	Approved. Awaiting Building Permit
Green Valley Plaza	200 Suisun Valley Road Fairfield	455,000 square feet		Commercial	Application Under Review
Frank Lin Distillers	2455 Huntington Drive Fairfield	N/A		Industrial	Completed

Name	Location	Acres	Units	Proposed Use	Status
Verizon MSC	2555 N. Watney Way Fairfield	49,235 square feet		Industrial	Under Construction
Clorox Tank Farm 1 & 2	2600 Huntington Drive Fairfield	N/A		Industrial	Under Construction
Lincoln Cordelia Road	2901 Cordelia Road Fairfield	119,000 square feet		Industrial	Time Extension Field
Lopes-Fermi Industrial Flex Building	555 Lopes Road Fairfield	32,509 square feet		Industrial	Time Extension Field
JCM Industrial Park	Cordelia Road at Hale Ranch Road Fairfield	841,000 square feet		Industrial	On Hold

Source: Caltrans, 2014d

## Farmlands

The cumulative setting for agricultural resources includes proposed developments within Solano County 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 a loss of substantial farmland. The Prime Farmland closest to the project limits is generally located west of Fairfield, in Suisun Valley. Construction of the project in combination with other planned development previously listed would contribute to the continued loss of agricultural land in the region. This is considered a cumulative effect. **Figure 2.4-1a and 2.4-1b** depict the locations of planned projects within Fairfield and Vacaville. Most of the projects would be constructed in developed and urban areas and do not affect farmland resources. However, several of the projects are located near Prime Farmland areas including, the Quinn Crossing Apartments (ID #37), Brighton Landing Residences (ID #2), Stratton Estates (ID # 32), and the JCM Industrial Park (ID #69). If these projects were to encroach onto Prime Farmland, they would also contribute to the cumulative impact to farmland resources.

As discussed in **Section 2.1.4, Farmlands/Timberlands**, the Build Alternative would convert 0.01 acres of prime farmland and Williamson Act property for a utility easement. This easement is located immediately adjacent to the I-80 corridor, where cultivation of agricultural products is limited to non-existent because of physical constraints associated with freeways (i.e., proximity to high traffic volumes). For this reason, and the relatively small acquisition anticipated, the farmland acquisition anticipated under the Build Alternative would not be a considerable contribution to 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. 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. Fairfield Fire Department, Fairfield Police Department, Vacaville Fire Department, and Vacaville Police Department provide protection and traffic enforcement services within the project limits. The California Highway Patrol (CHP) has jurisdiction over the I-80 corridor for matters involving traffic violations.

As discussed in **Section 2.1.3, Growth**, the study area has experienced stable development over the past several years. Such growth rates are expected to continue as per many proposed residential, commercial, and industrial developments proposed within the area (**Table 2.4-1**), and would continue to require public services from regional utility providers and emergency service providers. Accordingly, continued growth would require increased services, which is a cumulative effect.

As individual land use development projects are proposed, specific project-related effects associated with the provision of utilities and public services will be evaluated. The evaluation would assess the potential effects 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 in 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 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 encompasses the viewshed or visible environment surrounding the project limits. The majority of future development surrounding the project limits (listed in **Table 2.4-1**) will involve redevelopment of existing areas or infill development of vacant lots within urbanized areas. Therefore, the cumulative trend will continue to predominantly be redevelopment of existing low-intensity and underutilized parcels with new urban uses. The cities along the project limits have policies in place to direct growth and development towards existing urbanized areas. In addition, the City of Fairfield has entered into a greenbelt agreement with Vacaville, to preserve approximately 4,100 acres between Vacaville and Fairfield as agricultural lands. No urban development is proposed in rural areas and would occur within the cities' urban growth boundaries. New development proposed under the Vacaville General Plan could contribute to light pollution in the region as well. However, future development in all jurisdictions are subject to the California Building Code standards that would prevent potential impacts associated with light and glare.

None of the transportation improvement projects, including the Build Alternative, would substantially affect scenic vistas or resources. Proposed projects planned within Fairfield would comply with policies OS 1.4-OS 6 in the General Plan to reduce potential development-related effects on scenic vistas. Proposed project planned within Vacaville would comply with policies LU.P.2 and LU 2.1 in the General Plan to prevent development in open space areas and reduce visual effects. Effective implementation of such policies would ensure that the future land use projects listed in **Tables 2.4-1** would not adversely affect scenic vistas or resources. The planned land use developments and future projects, including the Build Alternative, would not result in cumulative effects to the visual character and quality of the I-80 corridor.

### **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, 2014n). 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 archaeological/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 Native American Heritage Commission (NAHC) who will then notify the most likely descendant (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.

Provisions to address unintentional adverse effects on archaeological resources within the project limits are included in the Avoidance, Minimization, and/or Mitigation Measures in **Section 2.1.9, Cultural Resources**. Environmentally Sensitive Areas (ESAs) and Testing/Treatment plans were established to protect known cultural resources within the area of potential effect (APE). The protective measures outlined in these plans include establishing (i.e., through protective exclusion fencing) and monitoring ESAs around the known archaeological site boundaries during construction, testing excavations and subsurface resource identification, and formal documentation of the results of the testing and data recovery. These ESAs and Testing/Treatment plans will be filed with the California State Historic Preservation Officer (SHPO) for concurrence with the protective measures. Issuance of a Finding of No Adverse Effect is dependent on the results of the planned subsurface testing during project construction. Pending their review and approval of completed construction phase testing, SHPO will issue a letter of concurrence for the Finding of No Adverse Effect if no resources are discovered. If resources are discovered during the construction phase subsurface testing, additional protective and/or avoidance plans would be prepared and submitted to SHPO for concurrence. The Build Alternative is not expected to cause an adverse effect to known archaeological sites with the implementation of the ESA and Testing/Treatment plans.

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 Storm Water Runoff**

The cumulative setting for hydrology, floodplains, water quality, and storm water runoff includes water resources and floodplains within the project limits. Historically, agriculture has impacted runoff patterns in the areas adjacent to the I-80 corridor in the West Segment of the project limits. Along the East Segment, runoff patterns are affected by the urban development. Anticipated development in the region (i.e., projects listed in **Table 2.4-1** and planned transportation projects), including the Build Alternative, would contribute to an increase in impervious surface in the watershed area that could increase the quantity and velocity of storm water runoff and reduce groundwater recharge. For those developments that appear to be located on higher elevations/hillside (ID Nos. 6, 13, 31, 44, 46, and 57), based on US topographic maps, groundwater recharge is not an issue given the depth to groundwater can range up to 20 feet deep. Certain land use development projects planned for in low-density urban areas may potentially convert natural ground cover to impervious structures and/or paved surfaces. 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 storm water controls, which include measures to reduce storm water pollutants, or otherwise minimize the change in rate and flow of storm water runoff. Each project would convey its storm water 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 **WQ-3**). Based on a review of 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 Sacramento Valley Air Basin and the San Francisco Air Basin. Past and present development within both air basins has contributed to increased levels of traffic congestion and degrading air quality conditions. The operation of the planned land use development projects listed in **Table 2.4-1** 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 Sacramento and San Francisco Air Basins would result in cumulative effects to air quality for permanent operational pollutant emissions. The projects listed in **Table 2.4-1** 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 Vacaville and Fairfield 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 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. The proposed project is included in Plan Bay Area, the Regional Transportation Plan (RTP), and the Regional Transportation Improvement Program (RTIP), which conform to the SIP. Therefore, 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 that was prepared for the project utilized projected (2040) traffic noise conditions from the Solano-Napa Travel Demand Forecasting Model, which represent cumulative conditions within the study area.

Planned developments considered in the cumulative noise analysis include those residential projects that have received final development approval are within approximately 500 feet of the centerline of I-80, 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 proposed developments near the study area are located within developed areas, as shown in **Figures 2.4-1 and 2.4-2**.

The majority of adjacent land uses approach or exceed noise abatement criteria (NAC) levels.<sup>1</sup> With more planned regional development, noise levels are anticipated to be almost equal to existing conditions in most locations, with a slight increase of 1 A-weighted decibel (dBA) for some areas. However, these changes are not considered a substantial increase in noise (defined as 12 dBA or more increase). With the exception of Segment 6 (located between Allison Drive to Leisure Town Road), all of the noise study area segments would experience noise levels that approach or exceed the NAC under the 2040 Build Alternative conditions, requiring noise abatement consideration. A total of 21 potential noise barriers were evaluated for feasibility, and reasonable allowance (see **Appendix G**). Ten of the twenty-one barriers were found to be both acoustically feasible and achieve the Caltrans noise reduction design goal (minimum 7 dBA reduction for at least one receptor). Two of the ten barriers were deemed feasible and reasonable, as identified in **Mitigation Measure NOI-A** and in **Table 2.2-37**. Barrier SW11 would be located on the north side of Davis Street/Hickory Lane on-ramp to westbound I-80. Barrier SW12a would be located along the eastbound I-80 edge of shoulder, in front of the Sunset Circle Mobile Homes Complex.

The implementation of the noise abatement options determined to be feasible and reasonable 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 conditions substantially change during final design, noise barriers might not be provided. The views and opinions of the residents living immediately adjacent to the I-80 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.

<sup>1</sup> NAC are used to determine when a noise impact would occur, depending on the type of land use under analysis.

## 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).

Development within the area from nearby past, current, and reasonably foreseeable future projects have affected biological resources in the region. Continued development trends would increase such disturbance to the California red-legged frog (*Rana draytonii*), American Badger (*Taxidea taxus*), western pond turtle (*Actinemys marmorata*), burrowing owl (*Athene cunicularia*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and others discussed in **Section 2.3, Biological Environment**.

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.

According to the Vacaville General Plan EIR, development allowed under the General Plan could contribute to the cumulative loss of habitat for a number of plant and animal species and sensitive habitats, including riparian habitats and wetlands. Similar effects could potentially occur in Fairfield. The Cities of Vacaville and Fairfield are participants in the Solano Habitat Conservation Plan (HCP). The Solano HCP anticipates that within the next 30 years, 16,000 acres of agricultural lands, grasslands, oak savannas, woodlands, vacant lots, and riparian habitats within the County could be converted to urban uses. Accordingly, the Vacaville and Fairfield have policies in place to reduce cumulative impacts to such land. However, proposed development within the General Plan area could result in significant effects to the Vacaville-Fairfield Greenbelt corridor, a key wildlife corridor for species. This wildlife corridor land is owned by Solano Irrigation District (SID). Because SID would not be able to use this land for purposes that would be compatible with a wildlife corridor, cumulative impacts to habitat for a number of plant and animal species is anticipated. However, the effects of the planned and programmed 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 the planned projects in the region.

The physical footprint of the proposed Build Alternative improvements may result in direct impacts to suitable habitat for a variety of sensitive natural communities, wetlands and other waters, and special-status species. The proposed project activities would include impacts outside the Caltrans right-of-way that would permanently convert mixed oak woodlands and riparian woodland. Permanent impacts to wetlands would include direct placement of fill within wetlands and loss of wetland vegetation due to shading effects. Any permanent loss of wetlands or habitat would be mitigated through creation of wetlands at an approved mitigation bank or conservation lands. The Build Alternative would not impact the Vacaville-Fairfield Greenbelt corridor because proposed work is limited to the I-80 corridor and its immediate right-of-way.

Water quality during 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 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 during construction
- implementation of worker environmental awareness training
- implementation of seasonal restrictions and work windows for certain construction activities
- installation of temporary fences and barriers around ESAs
- implementation of standard Caltrans BMP during construction
- conducting of pre-construction surveys
- coordination with agencies as needed
- proper use of vehicle use near sensitive natural communities
- restoration of damaged buffer areas after construction

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 burrowing owl and California red-legged frog. Therefore, compensatory mitigation measures have been proposed. See **Impacts BIO-A through BIO-F in Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**. 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.

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## 2.5 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<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF<sub>6</sub>), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO<sub>2</sub>, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).<sup>1</sup>

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/efficiency. To be most effective, all four strategies should be pursued cooperatively.<sup>2</sup>

### 2.5.1 REGULATORY SETTING

#### STATE

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

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<sup>1</sup> [http://climatechange.transportation.org/ghg\\_mitigation/](http://climatechange.transportation.org/ghg_mitigation/)

<sup>2</sup> [http://www.fhwa.dot.gov/environment/climate\\_change/mitigation/](http://www.fhwa.dot.gov/environment/climate_change/mitigation/)

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

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

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

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

Senate Bill 97 (SB 97) Chapter 185, 2007, Greenhouse Gas Emissions: This bill required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board (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.

## FEDERAL

Although climate change and GHG reduction are a concern at the federal level, currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level GHG analysis.<sup>3</sup> FHWA supports the approach that climate change

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<sup>3</sup> 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.

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

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

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

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 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 NHTSA issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.<sup>4</sup>

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

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<sup>4</sup> <http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq>

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 CO<sub>2</sub> emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

## 2.5.2 PROJECT ANALYSIS

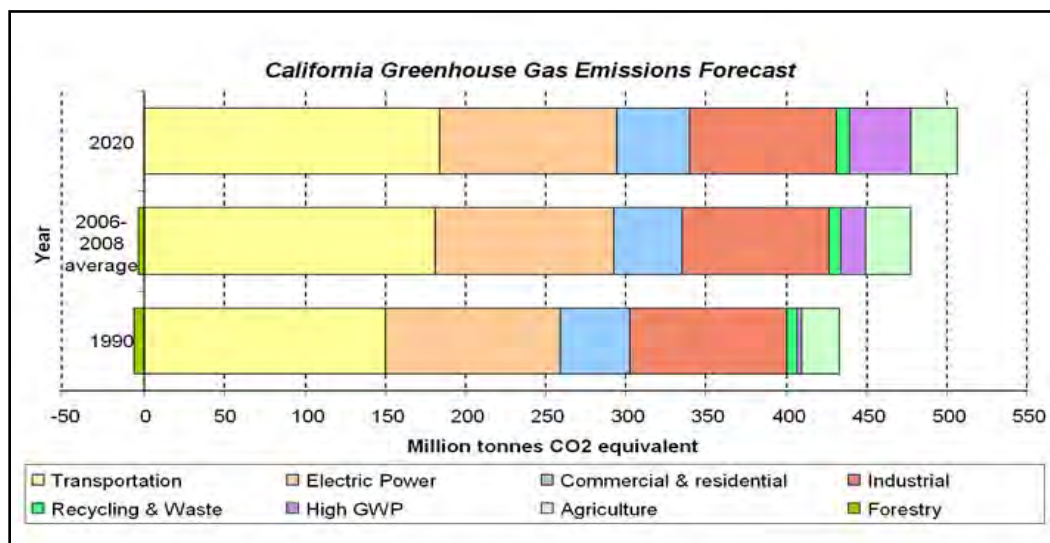
An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.<sup>5</sup> 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. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

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<sup>5</sup> 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 U.S. Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).



**Figure 2.5-1 California Greenhouse Gas Forecast**

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

The Department and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, the Department has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.<sup>6</sup>

Projections of future conditions for travel within the project limits are anticipated to increase substantially by the year 2040, largely as a result of local and regional residential and employment growth projected over that period. As indicated in the **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, the new express lanes would accommodate approximately 35 percent more vehicles, providing better distribution of vehicles over all the lanes, which would relieve congestion and queuing along the entirety of the I-80 study corridor. No bottlenecks are expected with implementation of the Build Alternative in opening year 2020.

As indicated in the **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, under the No-Build Alternative, several segments of the I-80 corridor are expected to deteriorate to unacceptable LOS E conditions relative to existing conditions, with speeds as low as 47 miles per hour (mph) in some locations. These segments would experience increased congestion in the general purpose lanes, particularly between Beck Avenue and Travis Boulevard, and from Manuel Campos Parkway to Peabody Road during the PM peak period eastbound. Traffic would also worsen between West Texas Street and Suisun Valley Road during the AM peak period westbound.

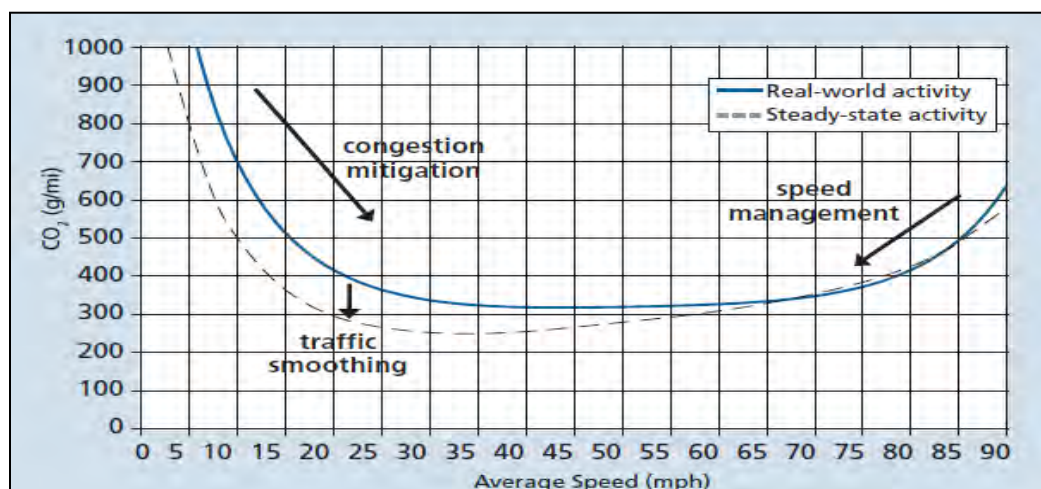
<sup>6</sup> Caltrans Climate Action Program is located at the following web address:  
[http://www.dot.ca.gov/hq/tpp/offices/ogm/key\\_reports\\_files/State\\_Wide\\_Strategy/Caltrans\\_Climate\\_Action\\_Program.pdf](http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf)

Average travel times along the I-80 study corridor are anticipated to increase by over 0.5 minutes by 2040, as indicated in **Table 2.1-26 of Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**.

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<sub>2</sub>), from mobile sources, such as automobiles occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0-25 miles per hour (see **Figure 2.5-2**). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO<sub>2</sub>, 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 discussed in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, under 2040 conditions, the Build Alternative would distribute projected increases in traffic volumes within the project limits, reduce bottleneck conditions, 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-80 corridor.

**Figure 2.5-2 Possible Effect of Traffic Operation Strategies in Reducing On-Road CO<sub>2</sub> Emission**



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

Under 2020 Build Alternative conditions, I-80 traffic congestion would be less than the traffic congestion anticipated under the No-Build Alternative. The conversion of the HOV lane to an express lane from Red Top Road to Air Base Parkway would result in a 6 percent increase in vehicles using the express lane, which would decrease congestion in the general purpose lanes. As indicated in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**,

overall, implementation of the Build Alternative would accommodate approximately 35 percent more vehicles, providing better distribution of vehicles over all the lanes, which would relieve congestion and queuing within the entirety of the I-80 project limits.

Under 2020 Build Alternative conditions, overall travel times within the project limits would be less than travel times anticipated under the No-Build Alternative. Overall, travel times would be reduced by up to 30 seconds relative to the 2020 No-Build Alternative, as shown in **Table 2.1-23 of Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**. During the AM peak period, express lane travel times would decrease by 1.9 minutes in the westbound direction and 1.8 minutes in the eastbound direction. During the PM peak period, express lanes travel times would decrease by 1.6 minutes in the westbound and 1.7 minutes in the eastbound direction. Overall, travel times would be reduced by up to 27 seconds relative to the 2040 No-Build Alternative, as shown in **Table 2.1-26 of Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**. Relative to general purpose lanes, express lane travel times would be reduced by up to 1.5 minutes in the eastbound and westbound directions in the AM peak hour. During the PM peak hour, there would be a travel time savings of up to 1.3 minutes in the westbound direction and up to 1.9 minutes in the eastbound direction, relative to the general purpose lanes.

The current regional transportation plan (RTP) for the San Francisco Bay Area, known as Plan Bay Area, was adopted by Metropolitan Transportation Commission (MTC) on July 18, 2013 and was approved by Caltrans on 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 pursuant 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. MTC’s Plan Bay Area is expected to achieve a 9 percent overall reduction in VMT between 2005 and 2040, which is short of their 10 percent VMT reduction target. This near-achievement of the per-capita VMT target reflects the carefully targeted locations of envisioned housing and commercial development in Priority Development Areas with excellent transit service.

The proposed project (RTP ID 240581 and 230660) is included in the regional emissions analysis conducted by MTC for the Plan Bay Area. Additionally, the project is included in the MTC’s 2013 Transportation Improvement Program (TIP) as project number SOL110001.<sup>7</sup> MTC approved the

<sup>7</sup> The project was originally listed under the two TIP numbers SOL110001 and SOL110002 (relative to the East and West Segments). TIP Amendment No. 2013-16 combined the two segments under one TIP ID SOL110001, and reprogramed the funding sources and phases.

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.

The STA's Comprehensive Transportation Plan (CTP 2030) for Solano County envisions, directs, and prioritizes the transportation needs of Solano County through the year 2030. The plan identifies HOV lane construction on the I-80 corridor within the county.<sup>8</sup> Additionally, express lanes on I-80 are identified as an operational strategy to implement the identified needs as outlined in the I-80/I-680/I-780 Major Investment & Corridor Study prepared for the STA.

**Table 2.5-1** shows project GHG emissions expressed in metric tons per day of CO<sub>2</sub>. CO<sub>2</sub> 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 2014q). Average peak period and off-peak period emission calculations were combined to generate an average daily emission total. GHG emissions are presented with and without the Pavley and Low Carbon Fuel Standard (LCFS) requirements. As indicated in **Tables 2.1-23** and **2.1-26** of **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, the Build Alternative will help relieve congestion in the traffic peak hour periods during the day. The net difference between the existing and build scenarios shows that even with the project, GHG emissions are predicted to decrease due mostly to the Pavley and LCFS requirements.

Assuming Pavley reductions apply to future emission rates, daily CO<sub>2</sub> GHG emissions were computed to decrease by approximately 202 metric tons per day under the 2020 Build Alternative conditions, as compared to existing conditions. Further in the future (i.e., year 2040), the reduction due to the project would be less than existing conditions at 37 metric tons per day, because traffic would increase substantially from planned growth. When compared to the No Build Alternative conditions, the project would have slightly higher emissions. This is because there would be higher traffic demand for the facility, as seen by the increased VMT associated with the Build Condition relative to the future No Build Alternative.

**Table 2.5-1 CO<sub>2</sub> Emissions in Metric Tons per Day**

CO <sub>2</sub> Emissions	Existing (2010)	2020 No Build	2020 Build	2040 No Build	2040 Build
CO <sub>2</sub> without Pavley	1,432	1,620	1,625	1,915	2,039
CO <sub>2</sub> with Pavley	1,427	1,222	1,225	1,306	1,390

Source: Caltrans, 2014a; Caltrans, 2014q

<sup>8</sup> Solano Transportation Authority Comprehensive Transportation Plan 2005, updates 2009; <  
<http://www.sta.ca.gov/Content/10054/ComprehensivePlans.html#ahf>>accessed on March 10, 2013.

## LIMITATIONS AND UNCERTAINTIES WITH MODELING

### EMFAC

Although EMFAC can calculate CO<sub>2</sub> emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO<sub>2</sub> 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,<sup>9</sup> brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO<sub>2</sub> 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<sub>2</sub> and CH<sub>4</sub> [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.<sup>10</sup>

### 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<sub>2</sub> emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2012,"<sup>11</sup> 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

<sup>9</sup> 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

<sup>10</sup> <http://www.arb.ca.gov/msei/offroad.htm>

<sup>11</sup> <http://www.epa.gov/oms/fetrends.htm>

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 percent from 2007 to 2012. **Table 2.5-2** 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 2.5-2 Average Required Fuel Economy (mpg)**

	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>

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.”<sup>12</sup>

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,”<sup>13</sup> 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

<sup>12</sup> [http://www.eia.gov/forecasts/aeo/pdf/0383\(2013\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf)

<sup>13</sup> <http://www.cbo.gov/ftpdocs/88xx/doc8893/01-14-GasolinePrices.pdf>

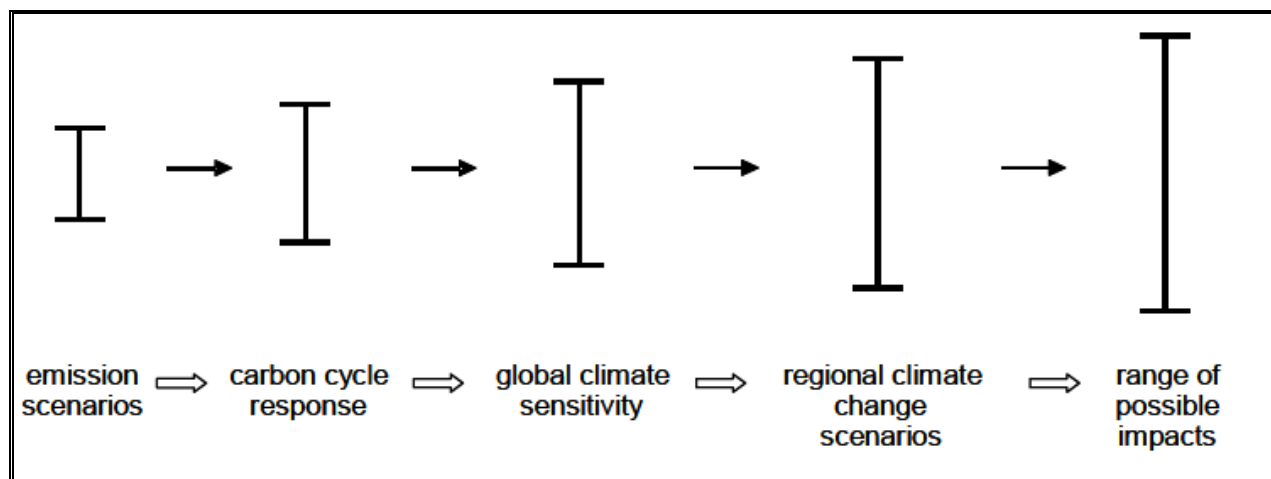
recent reports from the Energy Information Agency<sup>14</sup> and Bureau of Economic Analysis<sup>15</sup> also show slowing re-growth of vehicle sales in the years since its dramatic drop in 2009 due to the Great Recession as gasoline prices continue to climb to \$4 per gallon and beyond.

## LIMITATIONS AND UNCERTAINTIES WITH IMPACT ASSESSMENT

Taken from page 5-22 of the National Highway Traffic Safety Administration Final EIS for MY2017-2025 CAFE Standards (July 2012), **Figure 2.5-3** 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 2.5-3**). As indicated in **Figure 2.5-3**, the emission estimates used in this 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 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.”<sup>16</sup>

**Figure 2.5-3 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<sub>2</sub> emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO<sub>2</sub> equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple

<sup>14</sup>[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](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)

<sup>15</sup> Historical Vehicle Sales: [www.bea.gov/national/xls/gap\\_hist.xls](http://www.bea.gov/national/xls/gap_hist.xls)

<sup>16</sup> [http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL\\_EIS.pdf](http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf), page 5-22

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 CO<sub>2</sub> from 2000 to 2030, which represents an increase of between 25 and 90 percent.<sup>17</sup>

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<sub>2</sub> 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.

### 2.5.3 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 on-site construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. Currently Caltrans has not adopted GHG significance thresholds that apply to construction activities. For informational purposes, estimated GHG emissions from overall project construction were calculated.<sup>18</sup> Construction period GHG emissions were modeled using total expected duration of 24 months within the project limits. GHG emissions are estimated to be 1408 metric tons of CO<sub>2</sub> over the course of the entire construction project.

### 2.5.4 CEQA CONCLUSION

As discussed above, both the future with project and future no build show decreases in CO<sub>2</sub> emissions over the existing levels; the future build CO<sub>2</sub> 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<sub>2</sub> 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

<sup>17</sup> Intergovernmental Panel on Climate Change (IPCC). February 2007. Climate Change 2007: The Physical Science Basis: Summary for Policy Makers. <http://www.ipcc.ch/SPM2feb07.pdf>.

<sup>18</sup> RoadMod Version 6.3.2 was used for this analysis.

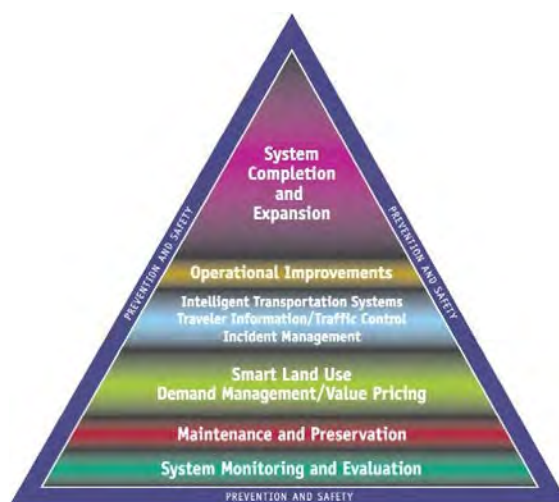


regarding significance of the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

## 2.5.5 GREENHOUSE GAS REDUCTION STRATEGIES

The Department continues to be involved on the Governor's Climate Action Team as the ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies the Department is using to help meet the targets in AB 32 come from then-Governor Arnold Schwarzenegger's Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO<sub>2</sub> reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in **Figure 2.5-3, The Mobility Pyramid**.

**Figure 2.5-4 Mobility Pyramid**



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

The Department is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill (SB) 375 (Steinberg 2008), SB 391 (Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32.

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs.

**Table 2.5-3** summarizes the Departmental and statewide efforts that the Department is implementing to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012): is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)<sup>19</sup> provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

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

- Caltrans and the California Highway Patrol are working with regional agencies to implement Intelligent Transportation Systems (ITS) to help manage the efficiency of the existing highway system. ITS commonly consists of electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.
- In addition, STA provides ridesharing services, park-and-ride facilities, and commuter information assistance to help manage the growth in demand for highway capacity (<http://www.commuterinfo.net/>).

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<sup>19</sup> [http://www.dot.ca.gov/hq/tpp/offices/orip/climate\\_change/projects\\_and\\_studies.shtml](http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml)

Table 2.5-3 Climate Change/CO2 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	1.2	4.2
				25% fly ash cement mix	0.36	3.6
				> 50% fly ash/slag mix		
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

- Landscaping reduces surface warming and, through photosynthesis, decreases CO<sub>2</sub>. The project proposes planting in the intersection slopes, drainage channels, and seeding in areas next to frontage roads as well as planting a variety of different-sized plant material and scattered skyline trees where appropriate but not to obstruct the view of the mountains. . An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. These replacement trees will help offset any potential CO<sub>2</sub> emissions increase.
- According to Caltrans' Standard Specifications, the contractor must comply with all local Air Pollution Control District's (APCD) rules, ordinances, and regulations for air quality restrictions. 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 the California Code of Regulations (CCR)). Clear signage shall be provided for construction workers at all access points.

### 2.5.6 ADAPTATION STRATEGIES

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

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011<sup>20</sup>, outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme

<sup>20</sup> <http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation>

events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks .

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

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

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop The California Climate Adaptation Strategy (Dec 2009)<sup>21</sup>, 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<sup>22</sup> to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.
- The range of uncertainty in selected sea level rise projections.

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<sup>21</sup> <http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>

<sup>22</sup> *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](http://www.nap.edu/catalog.php?record_id=13389).

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

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

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

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

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

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## 3.0 COMMENTS AND COORDINATION

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### 3.1 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 for the proposed project has been accomplished through a variety of formal and informal methods, including Project Development Team (PDT) meetings and interagency coordination meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

#### 3.1.1 CONSULTATION AND COORDINATION WITH PUBLIC AGENCIES

##### PROJECT DEVELOPMENT TEAM

Regular PDT meetings provided the forum for coordination, issue resolution, and information feedback between Caltrans and Solano Transportation Authority (STA).

PDT meetings began in March 2012 at the onset of the project with Caltrans. The PDT represents various fields of expertise, including design, environmental review, traffic operations, and project management. Accordingly, the PDT convened to review the project status, address issues as they arose, and provide overall direction throughout the project development process.

##### AGENCY CONSULTATION

In addition to the PDT meetings, there were 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), California Department of Fish and Wildlife (CDFW), Regional Water Quality Control Board (RWQCB), State Water Resources Control Board (SWRCB), State Historic Preservation Officer (SHPO), and the Metropolitan Transportation Commission (MTC) Air Quality Conformity Task Force/Federal Highway Administration (FHWA).

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 determined that the project is likely to adversely affect California red-legged frog. Formal consultation with USFWS under the Federal Endangered Species Act was initiated with the submission of a Biological

Assessment (BA) prepared for the project on March 20, 2015. A Biological Opinion (BO) was obtained from the USFWS on August 17, 2015.

Caltrans also initiates consultation with the National Marine Fisheries Service (NMFS) when a project has the potential to affect a federally-listed anadromous fish species or adversely affect designated critical habitat. Although the project would not affect habitat for central California coast DPS steelhead and Central Valley steelhead, federally-listed anadromous fish, it may affect, but is not likely to adversely affect these species. As the project has the potential to affect Central Valley steelhead and Central California Coast steelhead, federally listed anadromous fish, informal consultation with the NMFS was initiated in March 2015 with the submission of a BA prepared for the project. The NMFS agreed that because the project did not propose pile driving, there would be no likely impacts to the Central Valley steelhead and Central California Coast steelhead. Accordingly, NMFS agreed that under the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans' Districts 1, 2, and 4 issued to Caltrans by NOAA, the project is covered under Category 3. As such, no further opinion was needed.

A Section 404 permit is necessary when a project will result in fill to waters under USACE jurisdiction. A preliminary jurisdictional delineation was submitted to USACE for verification on October 29, 2014. A wetland verification site visit will be conducted during the plan, specification, and estimate (PS&E) phase of the project. 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.

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. .

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 East Segment would result in work within the channel of Ulati Creek and Horse Creek. Therefore, a Section 1602 permit would be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative.

Caltrans initiated consultation with the California State Historic Preservation Officer (SHPO) on May 12, 2015 in a letter stating that the project would not have any adverse effects to state-owned archaeological sites, landscaped, or non-structural resources that meet the National Register and/or California Historical Landmarks eligibility criteria. SHPO issued a letter of concurrence to this finding on July 2, 2015 (see **Appendix M**). The Build Alternative has established Environmentally Sensitive Area (ESA) and Testing/Treatment plans to protect known cultural resources within the APE (see **Section 2.1.9, Cultural Resources**). These plans will be filed with SHPO for concurrence with the protective measures. Issuance of a Finding of No Adverse Effect is dependent on the results of the planned subsurface testing during project construction. Pending their review and approval of completed construction phase testing, SHPO will issue a letter of concurrence for the Finding of No Adverse Effect if no resources are discovered. If resources are

discovered during the construction phase subsurface testing, additional protective and/or avoidance plans would be prepared and submitted to SHPO for concurrence.

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 (AQCTF) met on September 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), page S3-263 (RTP Reference No. 230659 and 230660 and TIP ID SOL110001<sup>1</sup>). The MTC 2015 RTIP was determined to conform by FHWA and FTA on December 15, 2014. The design concept and scope of the proposed project is consistent with the project description in the 2013 RTP, 2015 RTIP, and the open to traffic assumptions of the MTC's regional emissions analysis. An Air Quality Report, AQCTF Meeting Summary, RTP and TIP listings, Air Quality Conformity Checklist, and public announcements were submitted to the FHWA for review on August 26, 2015. Concurrence on the project-level air quality conformity was received from FHWA on September 22, 2015.

## OLEANDER REMOVAL IN THE CITY OF VACAVILLE

Oleander removal is required as part of this project as described in **Section 2.1.8, Visual/Aesthetics**. On January 17, 2014, Caltrans staff met with the City of Vacaville to better understand the City's position on median oleander preservation, as indicated in the City of Vacaville's City Gateways Plan, which specifically recognizes the aesthetic importance of the oleanders in the I-80 highway median and calls for them to be maintained and enhanced whenever possible. As a result of the meeting, it was determined that the viewer response from the community would likely be mixed in that some drivers may respond negatively to the removal of the ornamental plantings, while others may not. Businesses along the freeway would likely respond positively to the oleander removal, as it would improve visibility of their businesses from the freeway.

The environmental document describes the project and any changes to the existing visual character and resources within the project area including the removal of oleanders (see **Section 2.1.8, Visual/Aesthetics**). Viewer groups (i.e., neighbors and motorists) within the City of Vacaville were assigned a high sensitivity to the changes within the city limits due to the local value placed on the median oleanders. Overall, implementation of the Build Alternative would result in changes to the

<sup>1</sup> The project was originally listed under the two TIP numbers SOL110001 and SOL110002 (relative to the East and West Segments). TIP Amendment No. 2013-16 combined the two segments under one TIP ID SOL110001, and reprogramed the funding sources and phases.

existing visual environment. The changes would be more evident in the East Segment where roadway widening and vegetation removal would be required to accommodate new express lanes. However, the avoidance and minimization measures listed in **Section 2.1.8 (VIS-1 through VIS-6)**, which include replacement planting, would reduce the project's visual impact. As a result, the project would not substantially alter scenic vistas or scenic resources, and would not substantially degrade the existing visual character or quality of the area.

Community input was solicited during the 30-day public reviewing period of this IS/EA, from July 20, 2015 to August 18, 2015. Members of the community had an opportunity to provide written comments or concerns during the review period. Members of the community also had an opportunity to provide comments during the public open forum that was held on August 4, 2015 (see **Section 3.1.2, Public Participation** below). The City of Vacaville was also welcomed to provide further comments during this time. No comments from either the City or members of the community regarding the removal of oleanders were received.

### 3.1.2 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 5.0, Distribution List**). The notice provided information on the project including, a summary of the proposed improvements, where the environmental document could be reviewed, the address to where comments could be sent, and the closing date of the comment period. Two comments in total were received during the 30-day comment period and are included in **Section 3.2 Comments and Response to Comments** of this IS/EA.

The following methods were used to notify the public:

**Newspaper advertisements:** Quarter-page advertisements were placed in two local newspapers. The same newspaper advertisement ran in the Fairfield Daily Republic on July 21, 2015 and the Vacaville Reporter on July 19, 2015. The newspaper advertisements announced the availability of the draft IS/EA for review and the upcoming public open forum hearing that would be held on August 4, 2015.

**Corridor Mailing:** Informational mailers were sent to owners and residents of all properties within the first and second rows of land parcels adjacent to the project corridor. Approximately 1,000 mailers were mailed via US postal Service First Class Mail. The mailer contained a sentence in Spanish that directed all Spanish readers to the project website, where a Spanish version of the mailer was posted.

**Website:** The Caltrans website posted, for public review, the IS/EA and Appendices (<http://www.dot.ca.gov/dist4/envdocs.htm>). The same information was also posted on the Solano County Transportation Authority website ([http://www.sta.ca.gov/Content/10081/Interstate\\_Highway\\_Projects.html#i80express](http://www.sta.ca.gov/Content/10081/Interstate_Highway_Projects.html#i80express)) and the MTC website (<http://bayareaexpresslanes.org/announcements/>).

**Officials/Stakeholder Notification:** The project team invited the following government officials and community stakeholders to comment on the draft IS/EA:

- State and Federal Representatives
- Vacaville and Fairfield City Council Members
- Chambers of Commerce
- Business Associations
- Environmental Groups
- Libraries

The document was available for public review at the Caltrans District 4 Office, the Solano Transportation Authority Office, the Vacaville Public Library – Cultural Center, and the Fairfield Civic Center Library for public review.

## PUBLIC OPEN FORUM HEARING

A public open forum hearing was held from 6:00 pm to 8:00 pm on August 4, 2015 during the 30-day review period of the IS/EA document. The intent of the public forum was to solicit comments and receive input from the public and agencies on the environmental analyses and conclusions presented in the IS/EA, including the noise study report. The public open forum hearing was held in Conference Room B of the Solano County Events Center at 601 Texas Street, Fairfield, California. The hearing utilized an open forum format, and six members of the public attended. One comment was submitted in writing during the hearing. Comments were taken into consideration during preparation of this final IS/EA document.

### 3.1.3 NATIVE AMERICAN CONSULTATION

Sacred Lands File searches by the Native American Heritage Commission (NAHC) were conducted in January 2012 and April 2013 and determined that no recorded resources are known within or near the project APE. At that time, letters were sent to interested Native American groups. In May 2013 additional consultation of the current project was sent to these same parties.

One response was received from Mr. James Sarmento, Cultural Resources Manager, Yocha Dehe Wintun Nation. Mr. Sarmento indicated in his response letter that the project is within the aboriginal territories of the Yocha Dehe Wintun Nation and that the tribe has concerns that the project may have the potential to impact undiscovered cultural concerns. A site visit with the tribe was requested to be scheduled prior to construction activities.

As discussed in **Section 2.1.9, Cultural Resources, Measure CUL-2**, if human remains are discovered and thought to be Native American, the coroner will notify the NAHC who will then notify the Most Likely Descendent (MLD). The person who discovered the remains will contact District 4 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains.

## 3.2 COMMENTS AND RESPONSE TO COMMENTS

This section provides responses for comments received during the public review period for the draft IS/EA. Included are copies of all comment letters received up to the end of the public review period. No comments were received after the public review period. Only two comments were received and they are attached in order of receipt. **Table 3.2-1** indexes all comments received.

**Table 3.2-1 Index of Comments**

ID	Date of Comment	Commenter
C-1	August 4, 2015	Carolyn Burke (member of the community)
C-2	August 10, 2015	Department of Water Resources

Source: Circlepoint, 2015



## I-80 Express Lanes Project Public Comment Form

Comment forms may be returned today or mailed/e-mailed to the address below.  
Comments must be received no later than 5:00 p.m. on August 18, 2015.

Caltrans District 4  
Attn: Zachary Gifford  
111 Grand Avenue, Mail Station 8B  
Oakland, CA 94612  
E-mail to: zachary.gifford@dot.ca.gov

Name: CAROLYN BURKE-PARK VILLAS ASSN Date: 8-4-2015

Affiliation (if applicable): PRESIDENT OF ASSN Bd of Mgr

Address: 318 CREEKVIEW CT, VACAVILLE, CA 95688

E-mail: CBURKE2002@AOL.COM

### Comments:

THE ADDITIONAL ON-RAMP LANE BEHIND OUR FENCE  
IS NOW SO CLOSE (2 1/2 FT) THAT MOTOR NOISE MAY  
SURPASS THE 65 DEGREE LEVEL. ESPECIALLY WHEN  
THE METERING LIGHTS ARE TURNED ON. THE TEST  
HAS BEEN SHOWING 65 DEGREE AND WE REQUEST A  
NEW TEST WHEN THE HOV 3 METER LIGHTS ARE OPERATIONAL

*Please continue on back if necessary.*

### 3.2.2 RESPONSE TO COMMENT LETTER C-1: CAROLYN BURKE

A detailed Noise Study Report was conducted for this project that evaluated existing and future noise levels with and without the project. **Appendix G** shows the locations of the noise receptors studied. The traffic noise modeling completed to establish existing, future no-build, and future build conditions (with the additional on-ramp lane from Merchant Street to Westbound I-80) assumed free-flowing traffic conditions in order to calculate the loudest hour noise levels at receptors. Noise levels are expressed in terms of the A-weighted decibel (dBA) and the one-hour equivalent sound level (Leq). The loudest hour noise levels calculated at the receptor position in question (see R-39a in **Appendix G**) were 64 dBA Leq for existing conditions and 65 dBA Leq for future no-build and future build conditions. The predicted noise levels were below the Noise Abatement Criterion of 67 dBA Leq for Category B residential land uses. A common misconception is that the loudest hour occurs during the AM or PM peak traffic hour, when traffic volumes exceed capacity condition and HOV lanes and metering lights would typically be most used. However, congestion results in much slower speeds along the mainline and ramps, which substantially reduces traffic noise levels at adjacent receptors. Additional tests during time periods when HOV lanes and metering lights are operational would not be warranted because noise levels would be expected to be less than the loudest hour noise levels calculated assuming that traffic would be freely flowing.



**DEPARTMENT OF WATER RESOURCES**

1416 NINTH STREET, P.O. BOX 942836  
SACRAMENTO, CA 94236-0001  
(916) 653-5791



August 10, 2015

Zachary Gifford  
Office of Environmental Analysis, MS-8B  
Department of Transportation, District 4  
111 Grand Avenue  
Oakland, California 94612

Initial Study and Mitigated Negative Declaration, I-80 Express Lanes Project, City of  
Fairfield, Solano County, Near Milepost 17.0, Delta Field Division, SCH2015072037

Dear Mr. Gifford:

Thank you for the opportunity to review and comment on the I-80 Express Lanes Project (Project) Initial Study and Mitigated Negative Declaration (IS). The IS describes the proposal by the California Department of Transportation to provide High Occupancy Vehicle (HOV)/High Occupancy Toll lanes in both the westbound and eastbound direction of Interstate 80 from West of Red Top Road to east of Interstate 505 in Solano County. The Project would construct express lanes in the Interstate 80 (I-80) corridor through conversion of existing HOV lanes and highway widening for the new express lanes.

The North Bay Aqueduct (NBA) of the California Department of Water Resources, situated along the Fairfield Linear Park, crosses I-80 to the east of West Texas Street in the city of Fairfield. The vicinity where NBA crosses I-80 east of West Texas Street is within the boundary of the Project. Any construction activity in the vicinity of NBA may require an encroachment permit issued by DWR. Information regarding regulations and forms for submitting an application for an encroachment permit to DWR can be found at:

[http://www.water.ca.gov/engineering/Services/Real\\_Estate/Encroach\\_Rel/](http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/)

Please provide DWR with a copy of any subsequent environmental documentation when it becomes available for public review. Any future correspondence relating to this proposed project shall be sent to:

Leroy Ellinghouse, Chief  
SWP Encroachments Section  
Division of Operations and Maintenance  
Department of Water Resources  
1416 Ninth Street, Room 641-2  
Sacramento, California 95814

Zachary Gifford  
August 10, 2015  
Page 2

If you have any questions, please contact Leroy Ellinghouse, Chief of the SWP Encroachments Section, at (916) 659-7168 or Jonathan Canuela at (916) 653-5095.

Sincerely,



David M. Samson, Chief  
State Water Project Operations Support Office  
Division of Operations and Maintenance

cc: State Clearinghouse  
Office of Planning and Research  
1400 Tenth Street, Room 121  
Sacramento, California 95814

### 3.2.3 RESPONSE TO COMMENT LETTER C-2: DEPARTMENT OF WATER RESOURCES

The project will obtain all appropriate permits prior to construction. Should the project result in any construction activity in the vicinity of the North Bay Aqueduct (NBA), it will be determined if an encroachment permit issued by the Department of Water Resources (DWR) is necessary. If it is determined that an encroachment permit is needed, the project will follow the regulations and guidance for submitting an encroachment permit application found at:

[http://www.water.ca.gov/engineering/Services/Real\\_Estate/Encroach\\_Rel/](http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/)

A copy of the final IS/EA will be provided to the DWR once it becomes available for public review.

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## 4.0 LIST OF PREPARERS

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### **Solano Transportation Authority**

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Dale Dennis, Project Manager

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Helen Blackmore, Architectural History, Office of Cultural Resource Studies

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Ziad Abubekr, District Office Chief, North Counties

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Mark Thomas and Company, Inc. Marilou Ayupan, Division Manager/Associate

Admas Zewdie, Project Engineer

Richard Tanaka, Senior Principal

Jessica Arguello, Project Coordinator

Mahshid Maleki, Engineer

Shannon Lupton, Office Administrator

**HDR**

Mike Lohman, NorCal Transportation Leader

Brian Stewart, Project Engineer

Sheena Patel, Engineer

**Circlepoint**

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Jennifer Gallerani Marquez, Project Manager

Stephanie Davis, Senior Associate

Caitlin Chase, Associate Planner

Lily Gilbert, Associate Planner

Kyra Engelberg, Assistant Planner

Karen Fourgo, Business Operations Manager

Diana Sonne, Graphic Designer

Danae Hall, Assistant Planner

**Far Western Consultants**

Pat Mikkelsen, Principal

Nathan Stevens, Principal

**JRP Historical Consultants**

Chris McMorris, Lead

Rebecca Meta Bunse, Partner

Chandra Miller, Staff Historian

**WRECO Consultants**

Analette Ochoa, Senior Associate

Chris Sewell, Engineer

Jeff Tudd, Associate Hydraulic Engineer

**PaleoResources Consultants**

Dr. Lanny Fisk, President/CEO

David Haasl, Lead

Donna Lowenthal, Director of Operations

**Illingworth & Rodkin Consultants**

James Reyff, Project Scientist

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Keith Pommerenck, Consultant

Dana Lodico, Consultant

**Square One Productions**

Angela Lin, President

**HT Harvey**

Ginger Bolen, Senior Wildlife Ecologist

Patrick Boursier, Senior Plant Ecologist

**Condor Country Consulting**

Wendy Dexter, President/Principal Biologist

Sean Dexter, Project Manager

Ted Robertson, Biologist

**Parson Brinkerhoff**

Elizabeth Justison, Senior Supervising Engineer

Abby Caringula, Traffic Designer/Modeler



## 5.0 DISTRIBUTION LIST

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The draft Initial Study/Environmental Assessment (IS/EA) was distributed to the following state and regional responsible and trustee agencies; and elected officials. Distribution of the draft IS/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 50 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 the public open forum hearing as described in **Chapter 3.0, Comments and Coordination**. Furthermore, all property owners/occupants of properties contiguous to the project limits received a project mailer informing them of the availability of the Draft IS/EA.

### FEDERAL AGENCIES

Environmental Protection Agency, Region 9  
Federal Activities Office, CMD-2  
75 Hawthorne Street  
San Francisco, CA 94105-3901

Natural Resources Conservation Service  
Area 2  
1170 N. Lincoln Street, Suite 110  
Dixon, CA 95620

National Marine Fisheries Services  
Joe Heublein  
777 Sonoma Avenue Room 325  
Santa Rosa, CA 95404

US Army Corps of Engineers, Sacramento  
District  
ATTN: Regulatory Branch  
1325 J Street, Room 1480  
Sacramento, CA 95814  
U.S. Fish and Wildlife Service  
2800 Cottage Way W-2605  
Sacramento, CA 95825

### STATE AGENCIES

State Clearinghouse, Executive Officer  
1400 Tenth Street, Room 156  
P.O. Box 3044  
Sacramento, CA 95812-3044

Bay Area Air Quality Management District  
Jack Broadbent  
Chief Executive Officer  
939 Ellis Street  
San Francisco, CA 94109

California Air Resources Board\*  
Executive Officer Richard Corey  
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Sacramento, CA 95812

California Department of Fish & Wildlife  
Region 3\*  
Regional Manager Scott Wilson  
7329 Silverado Trail  
Napa, CA 94558

California Highway Patrol,  
Special Projects Section\*  
P.O. Box 942898  
Sacramento, CA 92298

California Office of Historic Preservation\*  
1416 Ninth Street, Room 1442  
Sacramento, CA 95814

California Public Utilities Commission\*  
Executive Director Paul Clanon  
505 Van Ness Avenue  
San Francisco, CA 94102

Department of Toxic Substances Control\*  
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P.O. Box 806  
Sacramento, CA 95812

Native American Heritage Commission\*  
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1550 Harbor Blvd, Suite 100  
West Sacramento, CA 95691

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California Office of Emergency Services  
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## REGIONAL AGENCIES

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Metropolitan Transportation Commission  
Doug Kimsey  
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## ELECTED/LOCAL OFFICIALS

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The Honorable Dianne Feinstein  
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The Honorable Mike Thompson  
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Mr. Skip Thomson, Supervisor  
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