Interstate 80 High-Occupancy Vehicle Lane Project



Initial Study/Proposed Mitigated Negative Declaration

04-Sol-80 KP 18.3/32.3(PM 11.45/20.1)

EA: 0A5311

Prepared by the
State of California Department of Transportation

December 2006

Caltrans Metric

Caltrans

GENERAL INFORMATION ABOUT THIS DOCUMENT

What's in this document:

The Department of Transportation (Department) has prepared this Initial Study, which examines the potential environmental impacts of the alternatives being considered for the proposed project located in and near the city of Fairfield, Solano County, California. The document describes why the project is being proposed; alternatives for the project; the existing environment that could be affected by the project; the potential impacts from each of the alternatives; and the proposed avoidance, minimization, and/or mitigation measures.

What you should do:

- Please read this Initial Study. Additional copies of this document, as well as the technical studies, are available for review at the following locations:

    - STA Offices (One Harbor Center, Suite 130, Suisun City, CA 94585
    - The main libraries of Fairfield (707) 421-6500, Vacaville (707) 469-4590, and Vallejo (707) 553-5568
    - Caltrans Office of Environmental Analysis, 111 Grand Avenue, 14th Floor, Oakland, CA 94612 (www.dot.ca.gov/dist4/envdocs.htm)

- We welcome your comments. If you have any comments regarding the proposed project, please send your written comments to the Department by the deadline.

    - Submit comments via postal mail to:

        Joseph Douglas
        Caltrans, District 04
        111 Grand Avenue
        Oakland, CA 94623

    - Submit comments via email to: Joseph Douglas (joseph_douglas@dot.ca.gov)

- Submit comments by the deadline: February 1, 2007

What happens next:

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

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to: _____
_____
_____.

SCH#
04-SOL-80-KP 18.23/31.65
(PM 11.38/19.68)
EA 04-0A5300

Construct High-Occupancy Vehicle Lane in the median of Interstate 80 from 0.5 mile (0.8 kilometer) west of Red Top Road to 0.5 mile (0.8 kilometer) east of Air Base Parkway in the City of Fairfield, Solano County, California

INITIAL STUDY/Proposed Mitigated Negative Declaration

Abstract:

This document has been prepared by the State of California Department of Transportation for the construction of the I-80 high-occupancy vehicle lane project to comply with the requirements of the California Environmental Quality Act. A Categorical Exclusion (CE) is being prepared separately for he purposes of the National Environmental Policy Act. The CE will be approved by the U.S. Department of Transportation, Federal Highway Administration. This project is intended to ease the congestion within the segment of I-80 between Red Top Road and Air Base Parkway in Fairfield, California. Forward comments on this document to:

Caltrans, District 04
111 Grand Avenue
Oakland, CA 94623
Attn: Joseph Douglas (510) 622-8799

Submitted Pursuant to:
(State) Division 13, California Public Resources Code

THE STATE OF CALIFORNIA
Department of Transportation

12/21/06
Date of Approval

Melanie Brent
Melanie Brent, Office Chief, Environmental Analysis,
California Department of Transportation

December 2006

Proposed Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The Solano Transportation Authority (STA) in cooperation with the California Department of Transportation (Caltrans) proposes to construct high-occupancy vehicle (HOV) lanes within the median of Interstate 80 (I-80) between Red Top Road and Air Base Parkway within Fairfield, California. The proposed work would include widening I-80 within the existing right-of-way at several locations and widening bridges over three watercourses (Ledgewood Creek, Green Valley Creek, and Suisun Creek) and one street (Travis Boulevard).

Determination

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

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

- The proposed project would have no effect on Land Use, Parks and Recreation, Community Impacts, Cultural Resources, Farmlands and Timberlands, Growth, and Paleontology.

- In addition, the proposed project would have no significant effect on Hydrology and Floodplain, Noise, and Geology/Soils/Seismic/Topography.

The proposed project would have no significantly adverse effect on Utilities and Emergency Services, Traffic and Transportation, Visual/Aesthetics, Water Quality and Stormwater Run-Off, Hazardous Waste/Materials, Air Quality, and Biological Resources because the following mitigation measures would reduce potential effects to less-than-significant:

Mitigation Measure UTL-1: Prepare Transportation Management Plan (TMP) to Notify Emergency Service Providers of the Construction Schedule and Any Associated Lane Closures

Mitigation Measure VR-1: Replace Oleander At or Near the Location Where it is Removed.

Mitigation Measure WQ-1: Prepare a Storm Water Pollution Prevention Plan (SWPPP)

Mitigation Measure WQ-2: Implementation of Appropriate Operation-related BMPs

Mitigation Measure HAZ-1: Dispose of ADL-Contaminated Soils in Accordance with Appropriate Regulations

Mitigation Measure HAZ-2: Prepare and Implement Water and Soil Sampling, Testing, and Treatment Plan

Mitigation Measure HAZ-3: Asbestos Removal by Certified Asbestos Abatement Contractor

Mitigation Measure HAZ-4: Notification of Contractors of Presence of Asbestos

Mitigation Measure HAZ-5: Notify Air Pollution Control Office (APCO) of Asbestos-Related Work

Mitigation Measure HAZ-6: Comply with All Applicable Hazardous Waste Management Regulations

Mitigation Measures AQ-1: Implement California Department of Transportation Standard Specification 7-1.01F and Standard Specification 10

Mitigation Measures AQ-2: Implement BAAQMD Control Measures for Construction Emissions of PM10

Mitigation Measure BIO-1: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Biological Resources to Be Avoided

Mitigation Measure BIO-2: Retain a Biological Monitor to Conduct Weekly Visits during Construction in or near Green Valley, Suisun, and Ledgewood Creeks

Mitigation Measure BIO-3: Avoid and Minimize Potential Indirect Disturbance of Riparian Communities

Miigation Measure BIO-4: Compensate for Permanent and Temporary Loss of Riparian Vegetation

Mitigation Measure BIO-5: Avoid and Minimize Potential Indirect Disturbance of the Seasonal Wetland near Green Valley Creek

Mitigation Measure BIO-6: Protect Water Quality and Prevent Erosion in Drainages

Mitigation Measure BIO-7: Obtain Required Permits, Authorizations, Certifications, and Agreements

Mitigation Measure BIO-8: Compensate for Permanent and Temporary Loss of Drainage Habitat

Mitigation Measure BIO-9: Install Exclusion Netting on the Undersides of Bridges to Prevent Swallows from Nesting Adjacent to New Bridge Construction

Mitigation Measure BIO-10: Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary

Mitigation Measure BIO-11: Establish a Minimum 6.1-Meter-Wide (20-Foot-Wide) Buffer around All Elderberry Shrubs Where Feasible

Mitigation Measure BIO-12: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel

Mitigation Measure BIO-13: Implement Dust Control Measures

Mitigation Measure BIO-14: Compensate for Indirect Impacts on Valley Elderberry Longhorn Beetle Habitat

Mitigation Measure BIO-15: Avoid and Minimize Temporary Impacts on Potential California Red-Legged Frog Aquatic Habitat

Mitigation Measure BIO-16: Compensate for the Loss and Disturbance of California Red-legged Frog Habitat

Mitigation Measure BIO-17: Prevent Contaminants and Hazardous Materials from Entering the Stream Channel

Mitigation Measure BIO-18: Restrict Timing of In-Water Work to Avoid Special-Status Fish Spawning Seasons

Mitigation Measure BIO-19: Avoid Potential Fish Spawning Habitat

Mitigation Measure BIO-20: Provide Alternate Migration Corridor through Creek Channel

Mitigation Measure BIO-21: Minimize Impacts on the Creek Channel

Mitigation Measure BIO-22: Minimize Noise Impacts on Special-Status Fish Species

Mitigation Measure BIO-23: Avoid the Introduction and Spread of Invasive Plants

James B. Richards
Deputy District Director
District 4
California Department of Transportation

Date

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Chapter 1 Proposed Project

1.1 Introduction

The Solano Transportation Authority (STA) in cooperation with the California Department of Transportation (Caltrans) proposes to construct high-occupancy vehicle (HOV) lanes within the median of Interstate 80 (I-80) from 0.5 miles (0.8 kilometer) west of Red Top Road to 0.5 miles (0.8 kilometers) east of Air Base Parkway within Fairfield, California (Figure 1-1). The proposed work would include widening I-80 within the existing right-of-way at several locations and widening bridges over three watercourses (Ledgewood Creek, Green Valley Creek, and Suisun Creek) and one street (Travis Boulevard) (Figure 1-2 through Figure 1-7).

1.2 Purpose and Need

1.2.1 Project Objectives (Project Purpose)

Interstate 80 is a critical east/west connector between the San Francisco Bay Area, Sacramento, and regions eastward (e.g., the Sierra Nevada range and beyond). Along the I-80 corridor, many segments experience extensive traffic congestion. Traffic congestion on I-80 is particularly high within Solano County, especially along the segment where I-80, I-680 and State Route (SR) 12 converge in the vicinity of Fairfield.

In an effort to address the congestion within this segment of I-80, STA, in conjunction with Caltrans, intends to construct eastbound and westbound regional HOV lanes along approximately 8.7 miles of I-80 from SR 12 West in Solano County to Air Base Parkway in Fairfield. Figure 1-1 shows the project area and existing transportation facilities.

The purpose of the proposed HOV lanes project is to:

1. Facilitate alternative modes to single-occupancy vehicles on I-80 within Solano County and the I-80/I-680/SR 12 Interchange area;
2. Increase the carrying capacity (i.e., number of people moved) of I-80 in Solano County and the I-80/I-680/SR12 Interchange area;
3. Reduce travel delays within the I-80 corridor;
4. Improve intermodal transportation along the I-80 corridor in Solano County; and
5. Encourage carpooling by allowing eligible vehicles to bypass congestion in the mixed-flow lanes.

As part of the I-80/I-680/I-780 Major Investment Study (MIS)/Corridor Study prepared in 2004, STA developed a plan and implementation program for a regional HOV system that would complement planned transit improvements and serve future transit, carpool, and vanpool users. The MIS identified various segments of I-80 in Solano County for future HOV lanes from the Al

Zampa Bridge (formerly Carquinez Bridge) to I-505. The proposed project is identified in the MIS as a mid-term, priority project. This segment of I-80 is currently a key component of the envisioned regional HOV system for Solano County. The proposed project's underlying need is discussed below.

1.2.2 Need for Project

1.2.2.1 Current and Future Demand for HOV Lanes

Automobile occupancy counts conducted during a.m. and p.m. peak-hour traffic on I-80 within the proposed HOV Lanes project area (i.e., at the Suisun Valley Road Overpass) in 2001 as part of the Solano County Comprehensive Transportation Plan indicate that as many as 24% of all vehicles traveling in the peak direction carried two or more passengers; by 2030, HOV use is expected to increase to 27% in the same location. Furthermore, the existing peak-hour HOV counts taken for I-80 between SR 12 West and Air Base Parkway are as high as 1,743 vehicles during the evening peak hour, which is more than double Caltrans' HOV threshold of 800 vehicles per hour (Solano Comprehensive Transportation Plan, Solano Transportation Authority 2005b). These existing counts and the projected carpools reflect the need for HOV lanes in the project area, which would provide an effective alternative mode of transportation to single occupancy vehicles and maximize the carrying capacity (i.e., number of people moved) through the I-80 corridor in Solano County.

1.2.2.2 Current and Future Traffic Volumes

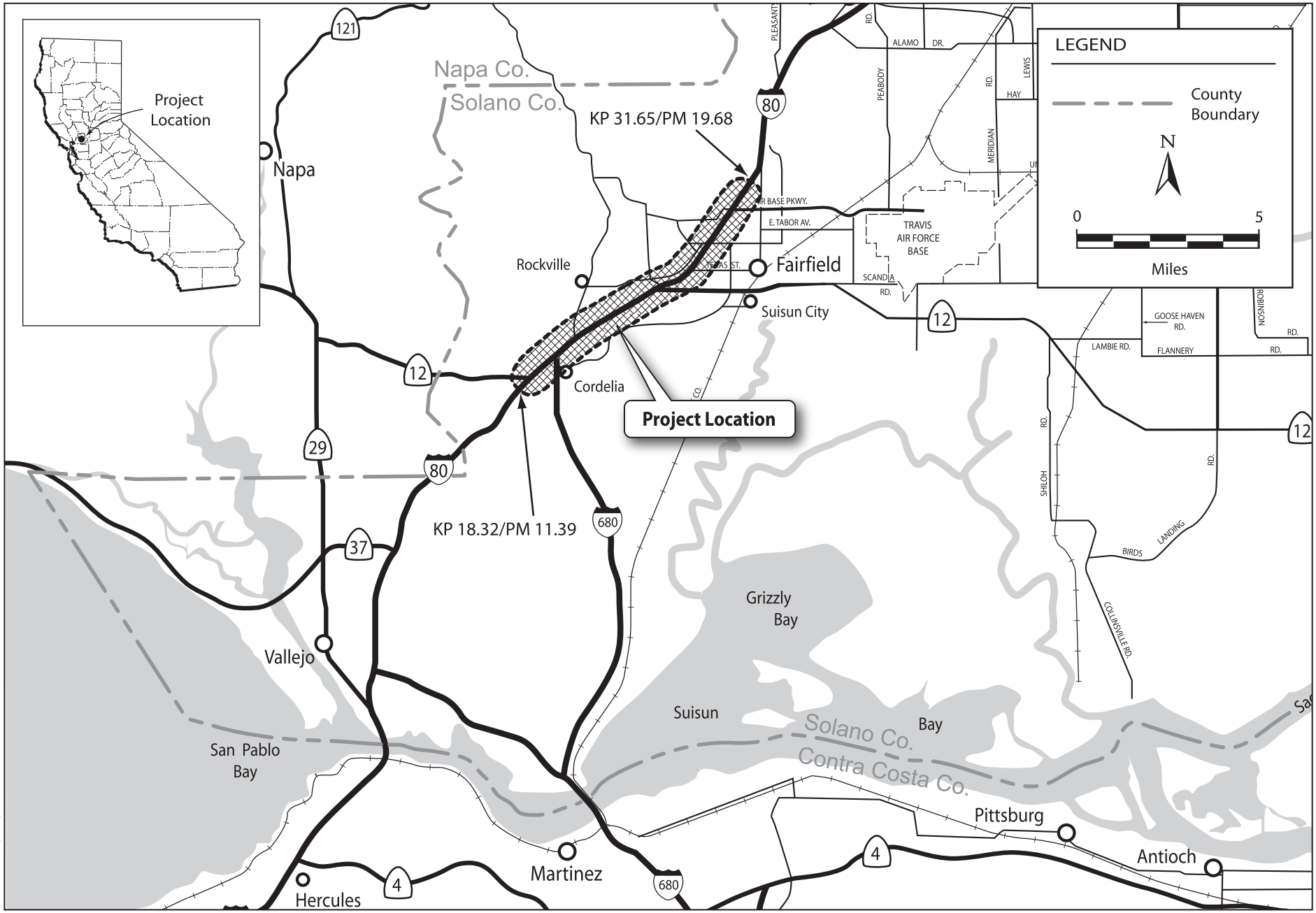
The need for HOV lanes in the proposed project corridor is reflected in current and projected high traffic volumes along I-80. Recent traffic data show that approximately 14,000–15,000 vehicles currently travel through the project corridor during each morning and evening peak-hour period (Table 1-1) in the most congested segment of the project area (i.e., I-80 West of SR 12 E). This corresponds to an estimated 150,000 vehicles currently passing through this critical segment of I-80 each weekday.

Table 1-1. Current and Projected Traffic Volumes in the I-80 Corridor

Location	AM Peak			PM Peak		
	Existing[1]	2030 No-Project	Annual Growth Rate[2]	Existing[1]	2030 No-Project	Annual Growth Rate[2]
I-80 West of Red Top—EB	3,480	5,060	1.7%	4,820	8,910	3.5%
I-80 West of Red Top—WB	3,860	7,330	3.3%	3,480	6,200	2.9%
I-80 West of SR 12 (E)—EB	5,650	7,850	1.4%	8,080	13,850	2.6%
I-80 West of SR 12 (E)—WB	8,470	12,500	1.7%	6,780	9,950	1.7%
I-80 East of Air Base Pkwy—EB	4,120	5,160	0.9%	7,350	10,010	1.3%
I-80 East of Air Base Pkwy—WB	6,970	9,120	1.1%	5,300	7,180	1.3%
Area-wide Average			1.6%			2.1%

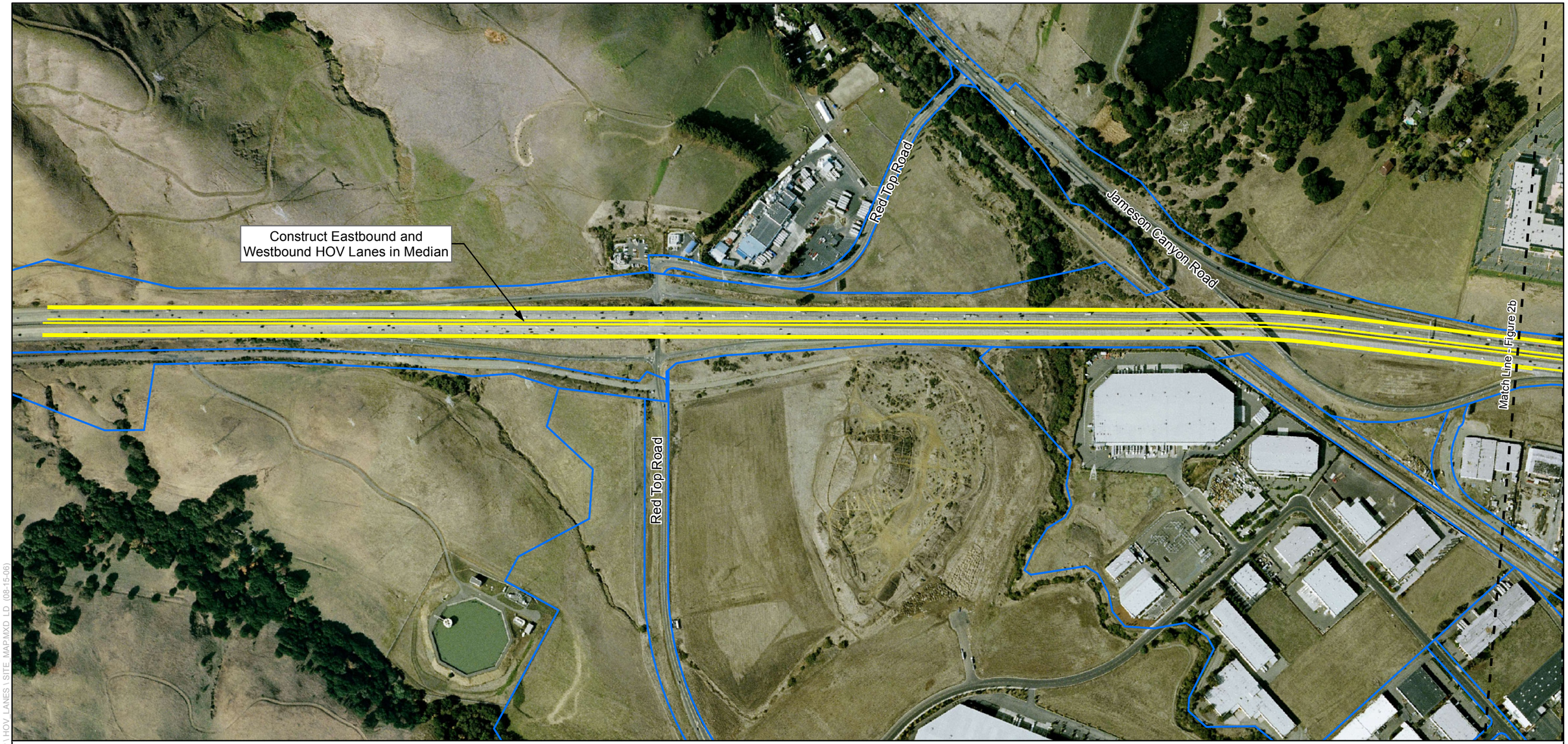
[1] Existing volumes were collected in late 2002 and late 2004.

[2] Annual growth rate calculated based on linear growth.



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Figure 1-1
I-80 HOV Lane Project Location



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Existing ROW

Proposed Project Components

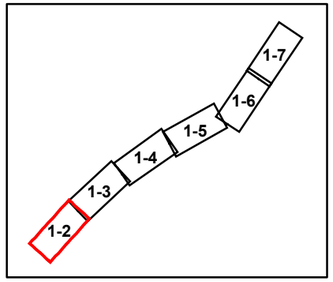
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Proposed Barrier

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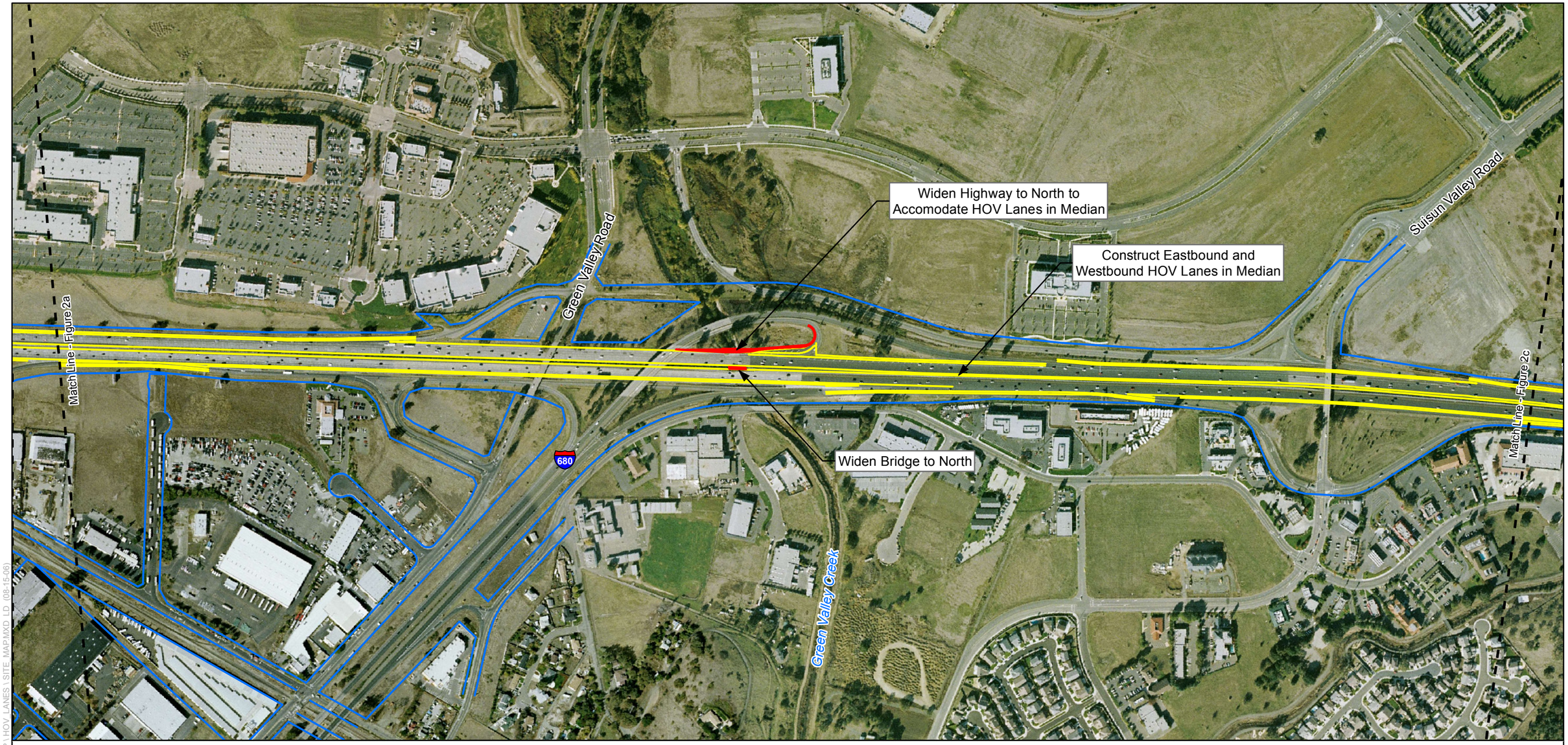
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Figure 1-2
Project Components



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Existing ROW

Proposed Project Components

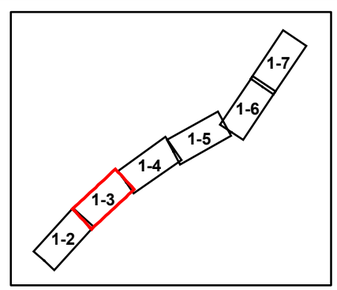
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Proposed Barrier

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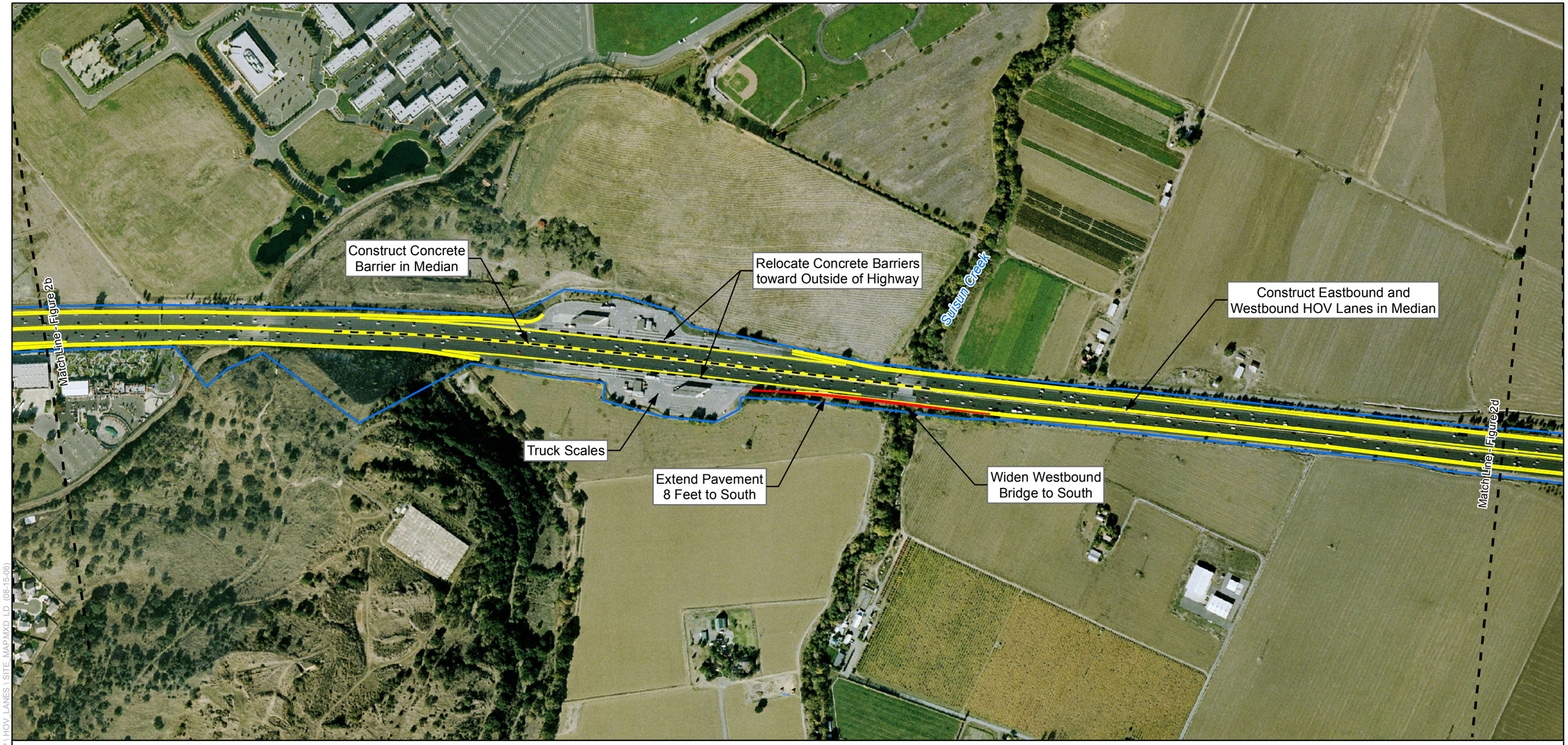
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Figure 1-3
Project Components



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Existing ROW

Proposed Project Components

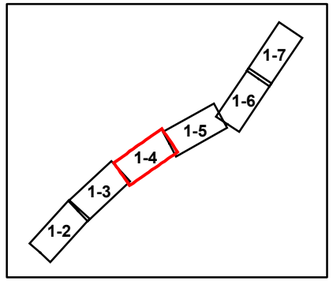
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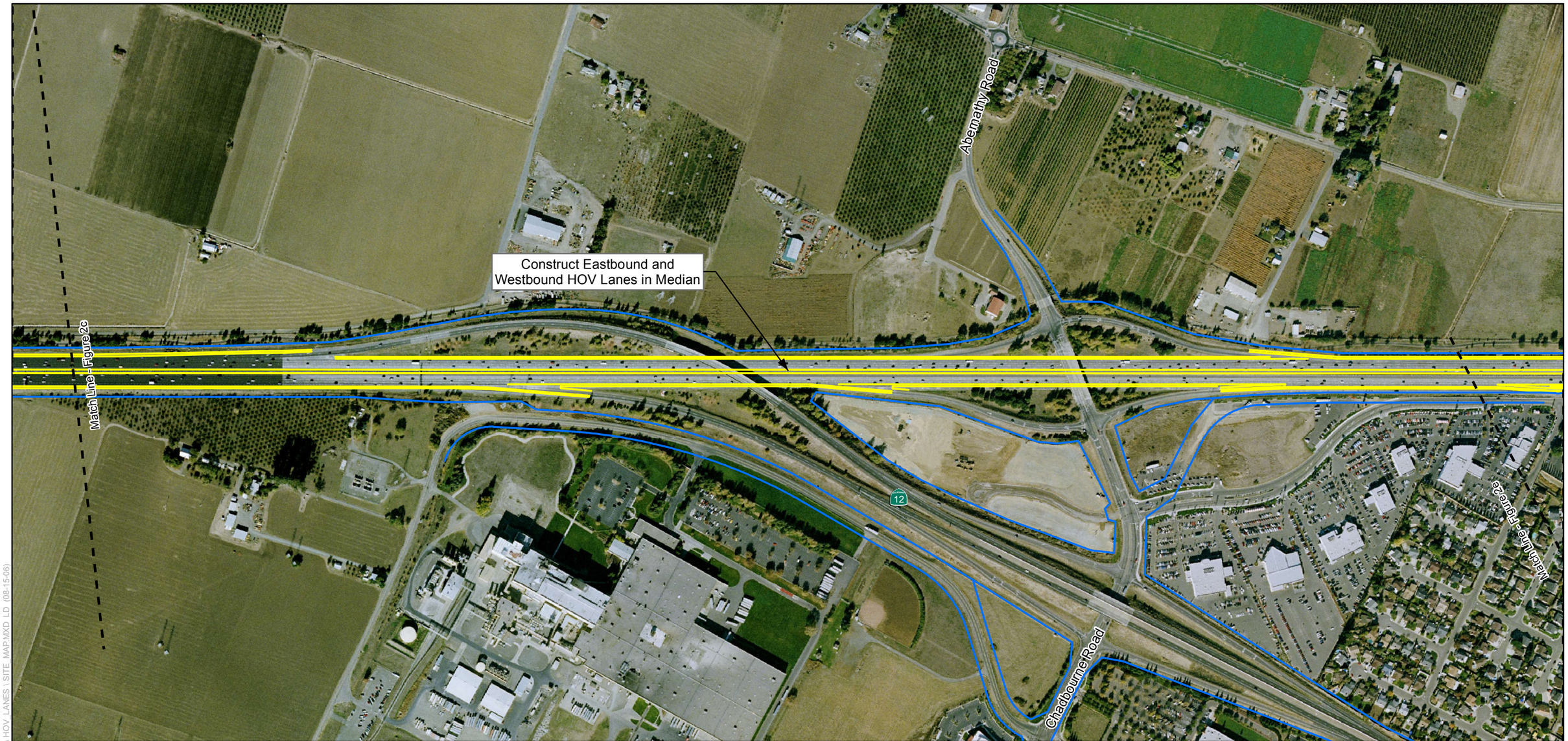
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Figure 1-4
Project Components



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Existing ROW

Proposed Project Components

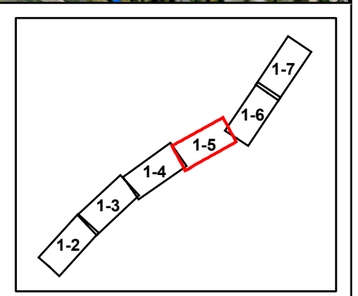
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Proposed Barrier

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Figure 1-5
Project Components



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Existing ROW

Proposed Project Components

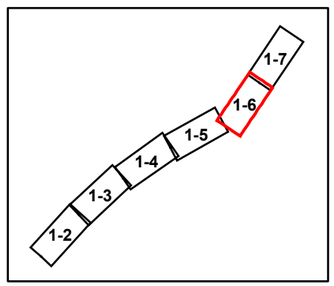
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Figure 1-6
Project Components



Legend

Existing ROW

Proposed Project Components

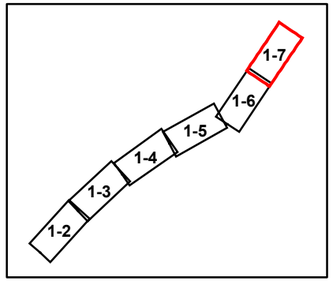
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Proposed Barrier

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Figure 1-7
Project Components

The number of vehicles passing through the project area is expected to grow substantially over the next 25–30 years. The Solano-Napa Travel Demand Model, which is consistent with Association of Bay Area Governments (ABAG) projections, projects a 43% growth in households and 58% growth in employees within the two counties over the next 25–30 years. Table 1-1 also shows that the projected average annual growth rate along the project corridor is between 1.6% (during morning commute) and 2.1% (during evening commute). This is consistent with the historic growth rate over the last 20 years.

Traffic volumes are projected to grow due to this in-county growth and growth throughout the Bay Area and Central Valley/Sacramento regions. Table 1-1 shows the resulting projected growth in traffic at I-80 west of SR 12 East ranging from over 20,000 vehicles in the morning peak hour to nearly 24,000 in the afternoon peak hour by 2030. These peak hour forecasts correspond to an estimate of approximately 220,000 vehicles traveling through the project corridor each weekday by 2030, an increase of 70,000 vehicles per day over current conditions.

Over the past ten years, commute travel through the area has increased substantially in response to the growing Bay Area economy and expansion of employment centers, which has pushed commuters further east as they seek affordable housing. By 2030, commute traffic is projected to constitute between 40% and 75% of the total number of vehicles traveling through the project area.

1.2.2.2.1 Deficient Levels of Service

Current traffic volumes along segments of I-80 in the project area create heavy traffic congestion, as measured by the levels of service (LOS). LOS is a qualitative description of traffic flow based on speed, travel time, delay, and freedom to maneuver. There are six levels, ranging from LOS A (the best operating conditions) to LOS F (the worst). LOS E represents *at-capacity* operation. When traffic demand exceeds capacity, a bottleneck develops and congestion occurs approaching the bottleneck. The bottleneck operates at capacity, LOS E, while queued segments (stop-and-go conditions) upstream of the bottleneck operate at LOS F. Currently the following roadway segments within the project area experience LOS F conditions with traffic operating speeds of less than 35 miles per hour (mph) during the peak periods.

- Eastbound I-80 between SR 12 West and the Cordelia Truck Scales during the afternoon peak period.
- Eastbound I-80 between the Travis Boulevard on-ramp and the Air Base parkway off-ramp during the afternoon peak period.
- Westbound I-80 (shoulder lane only) between the I-80/I-680 interchange and SR 12 West during the morning peak period.
- Westbound I-80 (right two lanes only) between SR 12 East and the Suisun Valley Road off-ramp during the morning peak period.

The current average freeway travel speed through the project area is 46 mph during the morning peak period, and 33 mph during the evening peak period. These average speeds are well below

the threshold of 59.7 miles per hour identified by the Highway Capacity Manual as the minimum operating speed associated with acceptable mainline freeway operations (Fehr & Peers 2005).

1.2.2.2.2 Vehicle-Miles Traveled

Another measure of traffic congestion is the number of vehicle-miles traveled (VMT) through the area, which considers both the total number of vehicles and the distance over which the vehicles must travel. While the total number of vehicles is projected to increase by 53% during the morning peak hour between year 2000 and 2030, the total VMT is expected to increase by 62%. The same trend is projected for the afternoon peak hour, where the total number of vehicles is estimated to increase by 62% while the VMT would increase by 73%. This indicates that vehicles would be required to travel longer distances in the future to bypass the increasing congestion within the project area.

1.2.3 Project Background

1.2.3.1 Project History

The proposed HOV lanes are included in the Metropolitan Transportation Commission's (MTC's) adopted Transportation 2030 Plan (February 2005), Reference #21807 and proposed RTP update. Planning studies that have led to development of the proposed HOV lanes project began in the late 1980s. The following is a summary of those studies.

- **1989:** MTC and the Sacramento Area Council of Governments (SACOG) completed the *Strategic Transportation Planning Study* (STPS). The STPS was a joint study of the regional I-80 corridor that forecasted long-term congestion on I-80 and showed that use of I-80 by local traffic in Solano County was a major contributing factor to that congestion.
- **1996:** MTC completed the *Interstate 80 Corridor Study*, which advanced a long-term multi-modal strategy and investment plan for improving mobility in the I-80 corridor.
- **2001:** STA completed the *I-80/I-680/I-780 Major Investment Study, Segment 1—I-80/I-680/SR 12 Tier 2 Evaluation Report*. The I-80/I-680/I-780 MIS provided a set of implementable projects to improve traffic flow on all of the Solano County freeways. The MIS built on the Solano County Comprehensive Transportation Plan, which established policies for non-highway elements of the transportation system.
- **2003:** MTC updated the 1997 HOV Lanes Master Plan, which addressed the potential for future HOV lanes in the Bay Area and included new surveys of potential HOV lane users. The Master Plan included HOV lanes on I-80 from I-680 to North Texas Street in Fairfield as a "Priority I" project and HOV Lanes from North Texas Street to I-505 as Priority II.
- **2004:** STA completed the *I-80/I-680/I-780 Major Investment and Corridor Study, Final Report* which developed a long-range, multi-modal transportation plan for the I-80, I-680 and I-780 corridors in Solano County. The study made recommendations for funded near-term, recommended mid-term, and long-term multi-modal improvements including HOV lanes on I-80.

- **2004:** STA completed the *I-80/I-680/I-780 Transit Corridor Study*. The study reviewed the express bus capital and operating needs along the I-80/I-680/I-780 corridors and presented recommendations for short- and medium-range improvements to the current system, a long-range Vision Plan for park-and-ride facilities, increased express bus services, and expanded maintenance facilities.

1.2.3.2 Related Projects

There are several transportation projects being planned or recently completed in the general project area that are related to the proposed I-80 HOV Lanes project. These projects are listed below (and their Caltrans EA project numbers where appropriate) in order of anticipated completion.

- **I-80/I-680 Auxiliary Lanes Project.** The I-80/I-680 Auxiliary Lanes project created a continuous fifth lane on I-80 between I-680 and SR 12 East and added a second lane to the I-80 ramps connecting I-680. The project was completed in 2004.
- **Benicia-Martinez Bridge Replacement Project.** Caltrans is currently in the construction phase of the new Martinez-Benicia Bridge replacement project, which provides a new I-680 crossing over the Carquinez Strait between Contra Costa and Solano Counties. The construction project includes the new five-lane bridge (four mixed use and one slow-vehicle lane), a new 17-booth toll plaza, reconstruction of the I-680/I-780 and I-680/Marina Vista Road interchanges, and modifications to the existing bridge. The project is scheduled for completion in 2007.
- **SR 12 West Truck Climbing Lane Project.** This project would construct a truck climbing lane in the westbound direction on SR 12 (West) from I-80 to west of Red Top Road. The project would reduce congestion on SR 12 (West) and the I-80/SR 12 (West) interchange by providing an additional lane for slow moving trucks, thereby allowing vehicles to pass. Construction of this project is anticipated to begin in 2007.
- **North Connector Project.** The North Connector project would construct a parallel route to the north of I-80 between Abernathy Road at I-80 on the east to SR 12 at Red Top Road on the west. The project is proposed to provide increased east/west capacity and provide an alternative to I-80 for local traffic. Construction of the first phase of the North Connector project is expected to begin in the 2007/2008 timeframe.
- **I-80/I-680/SR 12 Interchange Project.** The I-80/I-680/SR 12 Interchange project (EA-04-0A5300) would include numerous improvements to the I-80/I-680/SR 12 interchange to address existing and future traffic operations and congestion, including the relocation of the Cordelia Truck Scales. 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 environmental document for the project is currently underway and is expected to be completed in the 2008/2009 timeframe.
- **Transit Improvements.** To support increased transit ridership and expanded bus routes in the County, the I-80/I-680/I-780 Transit Corridor Study identifies numerous potential locations for park-and-ride lots in these major corridors, three of which could be located in

the project area; these include Red Top Road at I-80, a surface lot at Abernathy Road between I-80 and SR 12 or as an expanded parking structure at the Fairfield Multi-modal Transportation Center, and Gold Hill Road at I-680. These potential lots are expected to be constructed between 2010 and 2015 (STA 2004a, 2004b).

1.3 Project Description

The project is located in central Solano County on I-80, near and within the city of Fairfield (Figure 1-1). It encompasses approximately 8.3 miles (13.33 km) along eastbound and westbound I-80, from 0.5 mile (0.8 km) west of Red Top Road (KP 18.32/PM 11.39) to a point approximately 0.25 mile (0.8 km) east of Air Base Parkway (KP 31.65/PM 19.68). Within the limits of the proposed project I-80 is a divided highway with 12-foot lanes and a median that varies from approximately 19 to 35 feet (6 to 10.5 meters). Within the project limits the number of lanes traveling in one direction varies from four to eight. The proposed project consists of the construction of high-occupancy vehicle (HOV) lanes within the median in both directions and will serve to relieve traffic congestion during morning and evening peak commute hours, provide an alternative mode of transportation to single occupancy vehicles, and maximize the carrying capacity (i.e., number of people moved) through this segment of I-80.

The highway was constructed in 1958. Auxiliary lanes were added in both directions between the I-680 interchange and the eastbound SR 12 East connector in 2004. There are multiple on- and off-ramps along the project corridor. The interchanges listed below have eastbound (EB) and westbound (WB) on- and off-ramps:

- Red Top Road,
- I-680,
- Suisun Valley Road/Pittman Road,
- Abernathy Road,
- Rockville Road/West Texas Street,
- Travis Boulevard/Oliver Road, and
- Air Base Parkway/Waterman Boulevard.

Additional interchanges are:

- SR 12 West: WB off-ramp and EB on-ramp;
- Green Valley Road: WB off-ramp and EB on- and off-ramps; and
- SR 12 East: EB off-ramp and WB on-ramp.

Within the project limits, Green Valley Road, Suisun Valley Road/Pittman Road, Abernathy Road, Travis Boulevard/Oliver Road, and Air Base Parkway/Waterman Boulevard cross over I-80. West Texas Street/Rockville Road is the only road that passes beneath I-80 within the

project limits. Within the project limits, bridges span four watercourses (Green Valley Creek, Dan Wilson Creek, Suisun Creek, and Ledgewood Creek).

1.4 Alternatives

1.4.1 Alternatives Removed from Further Consideration

The project design team (PDT) developed a range of alternatives to address the project's need and purpose. Viable alternatives are discussed in the sections below. Nonfeasible alternatives are briefly summarized here.

Widening on the outside of I-80 was considered and rejected because it would

- Require acquiring additional right-of-way, which would result in delays in the scheduled improvements and an increase in the project cost;
- Require relocation of the Cordelia Truck Scales, which would increase the scope and cost of the project;
- Have a larger footprint and thus a larger impact on wetlands; and
- Require modification to various structures along the project corridor, resulting in delays and an increased project cost.

Several design options for the HOV lane begin and end locations were evaluated and rejected for various design and operational reasons. The following describes each design option and the reasons they were rejected.

Westbound Begin Option 1. Begin the new HOV lane immediately west of the Air Base Parkway/Waterman Boulevard overcrossing. This design option was rejected because the PDT wanted the HOV lane to extend as far as possible to give HOVs the opportunity to bypass queues should traffic congestion in the future extend beyond the Air Base Parkway/Waterman Boulevard overcrossing. However, if the costs for the proposed project become too excessive, then this design option could be used. If this design option is chosen, then the HOV lane should be extended further east as part of the I-80/I-680/SR 12 Interchange Project.

Westbound End Option 1. End the additional mainline lane approximately 1,600 meters west of the Red Top Road undercrossing and end the HOV lane delineation approximately 600 meters west of the Red Top Road undercrossing. This design option was rejected by the PDT because it would require widening the bridge over Red Top Road, which is planned to be reconstructed by the I-80/I-680/SR 12 Interchange Project. With the I-80/I-680/SR 12 Interchange Project, however, it is recommended that the HOV lane be extended further west.

Westbound End Option 2. End the HOV lane at SR 12 (west) and end the HOV lane delineation just west of the I-680 southbound connector. This design option was rejected by the PDT because ending the HOV lane designation in an already congested location is not desirable.

Eastbound Begin Option 1. Begin the new HOV lane approximately 1,000 meters west of the Red Top Road undercrossing. As with the Westbound End Option 1, this design option was rejected because it would require widening the bridge over Red Top Road, which would be re-constructed by the I-80/I-680/SR 12 Interchange Project. With the I-80/I-680/SR 12 Interchange Project, however, it is recommended that the HOV lane be extended to the west.

Eastbound End Option 1. End the additional lane at the Air Base Parkway/Waterman Boulevard overcrossing and end the delineation just east of the Travis Boulevard overcrossing. This design option was rejected by the PDT because ending the HOV lane designation in an already congested location is not desirable.

Eastbound Begin Option 2. Begin the new HOV lane just east of the SR 12 West overcrossing. This design option was rejected by the PDT because it would not provide sufficient queue bypass opportunity for HOV vehicles.

1.4.2 Proposed Build Alternative

The proposed project consists of the construction of HOV lanes within the median of Highway 80 between Red Top Road and Air Base Parkway. The project also involves the widening of portions of the highway near the Cordelia Truck Scales (and Suisun Creek overcrossing) and the I-80/I-680 interchange, and the widening of one street overcrossing and three bridges.

All work would be within the highway right-of-way. The HOV lanes in both directions would be contiguous within the project area and should be restricted to 2+ persons per vehicle during the morning and evening peak commute hours (usually 3 or 4 hours) on weekdays. The HOV lanes should be used as mixed-flow lanes during all other weekday hours and on a 24-hour basis on weekends. Motorcycles would be permitted in the HOV lanes at all times.

Construction is anticipated to begin in 2007 and be completed in 2008.

1.4.2.1 Highway Widening

The HOV lanes would be constructed within the median within the existing right-of-way (ROW). In areas where the median is not wide enough to accommodate standard-width HOV lanes while maintaining safety standards, some expansion would be necessary to the outside of the existing lanes. It would not be necessary to acquire additional ROW in these cases, but would require the realignment and restriping of existing lanes within the existing ROW. The HOV lanes would be 12 feet wide and the remaining left shoulder would vary between 7 feet 10 inches and 10 feet 10 inches wide and the remaining median would vary between 5 to 26 feet wide (excluding the shoulders).

Construction would consist primarily of grading to a maximum of 1 meter in depth, repaving, and restriping. Staging areas would be located within the median. Highway sections would be altered to encourage drainage to the sides of the highway and away from the median. Two portions of the project area would be widened to the outside of the lanes. These areas are at the truck scales and within the I-80/I-680 interchange.

1.4.2.1.1 Truck Scale Widening/Alteration

Concrete barriers currently in place would be moved toward the truck scales to facilitate addition of HOV lanes in both directions through the area. No new paving would be necessary to accommodate the additional lanes at the truck scales. However, it would be necessary to extend the pavement approximately 8 feet to the south to accommodate the necessary addition to the Suisun Creek crossing. This would result in paving approximately 0.14 acres (0.057 hectares) of currently unpaved surface on the south side of the eastbound highway between the truck scale entrance to I-80 and a point approximately 415 feet east of the east bank of Suisun Creek. In association with this widening, underground utilities would be removed and relocated. Lanes and the highway entrance and exit at this location would be realigned and restriped to incorporate HOV lanes.

1.4.2.1.2 I-80/I-680 Interchange Widening

Pavement would be added at the I-80/I-680 interchange to accommodate HOV lanes. Widening at the I-80/I-680 interchange would result in the paving of approximately 0.18 acres on the north side of the highway between the northbound I-680 overcrossing and the westbound I-80 hook ramp.

1.4.2.2 Bridge and Underpass Widening

The addition of HOV lanes will require widening of highway bridges over Green Valley Creek, Suisun Creek, Ledgewood Creek, and West Texas Street/Rockville Road. In each case, the bridge currently consists of two separate structures. In some cases, the existing bridges would be joined to facilitate expansion of the highway to accommodate HOV lanes in the median. In other cases, the existing median is not wide enough to accommodate HOV lanes, and the bridges will be widened to the outside of the highway. For each creek structure, it is assumed that the area potentially affected by project activities would be a parallelogram extending for 50 feet in each direction along the respective creek from the edge of the freeway and extending 50 feet each direction perpendicular to that creek from the edge of the existing bridge structure. The bridges and proposed construction techniques for each location are provided below.

1.4.2.2.1 Green Valley Creek Bridge Widening (23-04 R/L)

The existing Green Valley Creek Bridges on I-80 consists of two separate structures. The westbound bridge (BR No. 23-0004L) is a combination concrete T-beam and concrete slab structure. The eastbound bridge (BR No. 23-0004R) is a concrete slab bridge. Both bridges have three spans and the bridges are 80 feet long and 70 feet wide. The piers are pier wall type support and the abutments are strutted type abutments. The piers and abutments are supported on spread footings with seal course.

It is proposed to widen the westbound bridge (BR No. 23-0004L) to the north and south and the eastbound bridge (BR No. 23-0004R) to the north only to provide room for the HOV lanes. The widened portion of the bridges will be three-span concrete slab structures, measuring 80 feet long and supported on spread footings. The widened portion of the westbound bridge will measure approximately 24 feet 6 inches wide. The widened portion of the eastbound bridge will extend approximately 10 feet to the north.

Bridge-Widening Construction Activities

Construction of the widening is expected to last approximately 5 months and the construction will be scheduled from May to October to minimize impact to sensitive animal species. In-stream construction would not take place before June 1 or after October 1 to minimize impacts on sensitive fish species.

The majority of the construction equipment would access the construction site from the north side of the freeway. However, equipment access may be needed from the south side of the freeway as well to construct the temporary cofferdams and to remove the bridge falsework and temporary cofferdams after construction is complete. Southern access would be from the vacant lot at the corner of Central Way and Grobric Court. A staging area will be located within the curve of the I-680 entrance to westbound I-80.

Bridge-widening construction would entail the activities listed below.

- Install temporary concrete barriers (Type K) on the edges of the existing bridges: north and south edges of the westbound bridge (BR No. 23-0004L) and north edge of the eastbound bridge (BR No. 23-0004R).
- Construct temporary cofferdams at locations both upstream and downstream and install a pipe diversion system. The location of the cofferdams will be 20 feet from the limit of widening.
- Remove existing concrete barriers, and drill and bond dowels to the existing deck for eastbound and westbound structures.
- Perform structure excavation to construct the footing for the piers and abutments. The size of abutment footing is 18 feet long by 6.5 feet wide and the bottom of the footing would be 8 feet below original ground. The total excavation for both abutments is approximately 230 cubic yards. The size of the pier footing is 18 feet long by 5 feet wide and the bottom of the footing would be 8 feet below the channel bottom. The total excavation for both piers is approximately 85 cubic yards. It is anticipated that individual cofferdams would be required for each footing excavation due to the high groundwater. The size of the cofferdam would be slightly larger than the footing plan dimensions and steel sheet pile would be installed to form the cofferdams.
- Place 3 foot–thick concrete seal course at the bottom of the cofferdams for the abutment and pier wall footings to facilitate the footing construction. After the footing and pier wall are constructed, the steel sheet piles will be retracted after backfilling.
- Install the falsework in the channel to construct the concrete deck for the superstructure.
- Construct the closure pour to connect the widening structure with the existing bridge.
- After completion of the closure pour, remove the falsework and the cofferdam.
- Reconstruct the removed portions of the creek concrete invert slab. This invert slab will be extended to the edge of the widened bridge structure. Once the concrete invert slab is complete, the cofferdam will be removed. The channel will be restored to its original condition.

1.4.2.2.2 Suisun Creek Bridge Widening (23-07 R/L)

The existing Suisun Creek Bridge on I-80 consists of two separate structures, though there is no gap between them. The eastbound bridge is a combination concrete T-beam and concrete slab bridge. The westbound bridge is a concrete slab bridge. Both bridges have three spans and are 72 feet long and 156 feet wide. The bridges are supported by wall-type piers and strutted-type abutments, which are supported on spread footings.

It is proposed to widen the bridge on the south side to accommodate the HOV lanes. The widened portion of the bridge would be a three-span concrete slab structure measuring 80 feet long and 8 feet wide located on the south side of the eastbound lanes. It would be supported on spread footings.

Bridge-Widening Construction Activities

Construction of the widening is expected to last approximately 5 months and the construction would be scheduled from May to October to minimize impact to sensitive animal species. In-stream construction would not take place before June 1 or after October 1 to minimize impacts on sensitive fish species.

Construction equipment would access the construction site from the shoulder of the south side of the freeway. No cofferdams would be necessary because of the extremely low flows in this creek during the summer months. It may be necessary to drive sheet piling around the footings to keep groundwater from the construction. It would be necessary to relocate signage and utilities to the south within the existing right-of-way.

Bridge-widening construction would entail the following activities.

- All construction equipment would access the construction site from the south shoulder.
- Install temporary concrete barriers on the existing bridge.
- Remove existing concrete barriers, and drill and bond dowels to the existing deck.
- Excavate to construct the footing for the piers and abutments. The size of abutment footing is 12 feet long by 6.5 feet wide and the bottom of the footing will be 8 feet below original ground. The total excavation for both abutments is around 160 cubic yards. The size of the pier footing is 12 feet long by 5 feet wide and the bottom of the footing would be 8 feet below the channel bottom. The total excavation for both piers is approximately 60 cubic yards. It is anticipated that no cofferdam will be necessary due to low water levels in the creek in the summer months. However, steel sheet pile will be installed to control groundwater.
- Place a 3-foot thick concrete seal course at the bottom of the sheet piling. After the footing and pier wall are constructed, the steel sheet pile would be retracted after backfilling.
- Install the falsework in the channel to construct the concrete deck for the superstructure.
- Construct the closure pour to connect the widening structure with the existing bridge.
- After completing the closure pour, remove the falsework. The channel will be restored to its original condition.

1.4.2.2.3 Ledgewood Creek Bridge Widening (23-08 R/L)

The existing Ledgewood Creek Bridge on Route 80 consists of two separate structures. Both eastbound and westbound bridges are concrete slab bridges. Both bridges have three spans and measure 78 feet long and 72 feet wide. The piers and abutments are supported on pile extensions and both abutments have 10 inch–thick concrete diaphragms with a depth of 5 feet 9 inches. The channel under the bridge is concrete lined with a low flow fish channel.

There is a gap of 18+/- feet between the two bridges. It is proposed to widen both bridges to close the gap to provide room for the HOV lanes. The widened portion of the bridge would be a three-span concrete slab structure measuring 78 feet long and 18 feet wide, and would be supported on concrete driven pile extensions.

Bridge-Widening Construction Activities

Bridge-widening construction is expected to last approximately 5 months and the construction will be scheduled from May to October to minimize impact to sensitive animal species. In-stream construction would not take place before June 1 or after October 1 to minimize impacts on sensitive fish species.

The majority of construction equipment would access the site from the median. However, because the gap in the bridge at the median would be closed by bridge construction, it would be necessary to remove materials from the south (downstream) side of the creek crossing upon completion of construction. A 200-foot-long existing gravel road that provides access to the Ledgewood Creek Canal can be used to gain access from the corner of Auto Mall Parkway and Hamilton Avenue. Based upon the height restrictions, it is expected that the equipment used to remove the building and waste materials would be light-weight with rubber tires.

The bridge-widening construction would entail the activities listed below.

- The majority of construction equipment would access the construction site from the median. Some equipment access would be needed from the side of the freeway at the end of construction to remove falsework and cofferdams.
- Install temporary concrete barrier on the existing bridges.
- Construct temporary cofferdams and install a diversion system at both upstream and downstream locations. The location of the cofferdam will be 15 feet from the limit of widening. The cofferdam can be easily constructed on the existing concrete-lined channel with little impact to the channel.
- Remove existing concrete barriers, and drill and bond dowels to the existing deck of eastbound and westbound structures.
- Drive concrete piles into place at both abutments.
- Drill 15-inch diameter holes through the existing concrete lined channel for the installation of the piles for piers. The extra space between the piles and hole would be grouted with concrete around the piles.

- There would be no excavation in the channel for the widening construction. Thirty cubic yards of structure excavation would be required for the construction of the abutment diaphragms.
- Install the falsework on top of the concrete-lined channel to construct the concrete deck for the superstructure.
- Construct the closure pour to connect the widening structure with the existing bridge.
- After completing the closure pour, remove the falsework and the cofferdam.

1.4.2.2.4 West Texas Street Undercrossing Widening (23-106 R/L)

The existing West Texas Street undercrossing on Route 80 consists of two separate concrete box girder structures. Both bridges are 66 feet wide and each has three spans with total lengths of 216 feet for the north or westbound bridge and 200 feet for the south or eastbound bridge. All bents have three 3- by 4-foot rectangular columns. The abutments are diaphragm type abutments, and the bents and abutments are supported on concrete or steel-driven piles.

There is a gap of 23+/- feet between the two bridges. It is proposed to widen both bridges to close the gap to provide room for the HOV lanes. The widened portion of the bridge will be a three span concrete box girder structure supported on concrete driven piles and will measure 200 feet long and 23 feet wide.

Bridge Widening Construction Activities

Construction associated with the bridge widening is expected to last approximately 8 months. No seasonal restrictions are anticipated, as this bridge does not cross a watercourse.

Construction of the widening would entail the activities listed below.

- Install temporary concrete barrier on the existing bridges.
- Remove existing concrete barriers and 2.5 feet of the existing deck from both eastbound and westbound structures.
- Drive concrete piles or steel piles into place at two bents and both abutments.
- Excavate to construct the footing for the bents and abutments. The size of abutment diaphragm is 23 feet long by 2.5 feet wide and the bottom of the diaphragm is 10 feet below the finish grade. The total excavation for both abutments is around 80 cubic yards. The size of the bent footing is 9 feet by 9 feet and the bottom of the footing will be 6 feet below the finish grade. There are two columns at each bent. The total excavation for both bents is around 110 cubic yard.
- Install the falsework over the traffic to construct the superstructure.
- Construct the closure pour to connect the widening structure with the existing bridge.

1.4.3 No-Build Alternative

Under the No-Build Alternative, no HOV lanes would be added, and traffic patterns would continue as they are currently developing, resulting in more congestion and reduced levels of service in the future.

Recent traffic data show that approximately 150,000 vehicles currently pass through this critical segment of I-80 each weekday. The number of vehicles passing through the project area is expected to grow substantially over the next 25–30 years. Factors contributing to this growth are primarily community and economic growth in Napa and Solano Counties and an increase in commuter traffic to the Bay Area. The projected average annual growth rate along the project corridor is between 1.6% (during morning commute) and 2.1% (during evening commute). By 2030, it is estimated that 220,000 vehicles will be traveling through the project corridor each weekday.

1.5 Permits and Approvals Needed

Table 1-2 lists permits, reviews, and approvals that would be required for project construction.

Table 1-2. Permits, Reviews, and Approvals Required for Construction

Agency	Permit/Approval	Status
U.S. Army Corps of Engineers	Section 404 Nationwide 14 and 33	Pending
U.S. Fish and Wildlife Service	Section 7, ESA	Pending
California Department of Fish and Game	Section 1602, SAA	Pending
San Francisco Bay Regional Water Quality Control Board	Section 401/402/National Pollutant Discharge Elimination System permit	Pending
Caltrans (Pursuant to 2004 Section 106 Programmatic Agreement)	Section 106	Complete

1.6 Funding

Primary funding for the project is from Regional Measure 2; this project is part of the Corridor Improvements near Interstate-80/ Interstate 680 Interchange being sponsored by the Solano Transportation Authority (Total RM2 funding of $100million). The STA will fund all activities, except the oversight activities performed by Caltrans. The State (Caltrans) will own, operate and maintain the completed work, including funding of those activities.

The project is fully funded, with distributions listed as follows:

- Identified as part of Regional Measure 2, Capital Project No. 2, $100 million total funding has been allocated for both the Solano North Connector and this project, the Solano I-80/I-680 Interchange Complex (HOV lanes from SR12 W to Airbase Parkway).
- $5 million has been requested from the Regional Transportation Improvement Program.
- $15 million is from Caltrans 2006 Interregional Transportation Improvement Program

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

This chapter describes the environmental conditions in the area potentially affected by the proposed project, the potential effect of the project on these conditions and avoidance, minimization and mitigation measures to lessen any effects. The information presented here has been summarized from technical reports prepared for most of the resource areas. These reports, listed below, are available for review at the Caltrans District 4 office.

- Preliminary Geotechnical Report, Interstate-80 HOV Improvement, Solano County, California, 04-Sol-80 KP18.23/32.3 prepared by Parikh Consultants, Inc. for STA (STA 2006a)
- Draft Traffic Analysis Report for the Interstate 80 HOV Project: Red Top Road to Air Base Parkway prepared by Fehr & Peers for STA (STA 2006b)
- Memorandum Section 106 review for the proposed installation of High Occupancy Vehicle (HOV) lanes in central Solano County on Interstate 80 within the City of Fairfield (Caltrans 2005)
- Abbreviated Visual Impact Assessment for I-80 HOV Project: Red Top Road to Air Base Parkway prepared by CirclePoint for STA (STA 2006c)
- Initial Site Assessment, Solano Interstate 80 HOV Project, Interstate 80 between Cordelia and Fairfield, Solano County, California prepared by Geocon Consultants, Inc. (STA 2006d)
- Asbestos Survey Report, Solano Interstate 80 HOV Project, Solano County, California prepared by Geocon Consultants for STA (STA 2006e)
- Noise Study Technical Report in and near the City of Fairfield, Solano County, California, between Red Top Road and Air Base Parkway prepared by Jones & Stokes for STA (STA 2006f)
- Natural Environmental Study Report: Interstate 80 High-Occupancy Vehicle Lane Project, City of Fairfield, Solano County, California prepared by Jones & Stokes for STA (STA 2006g)
- Air Quality Technical Report in and near the City of Fairfield, Solano County, California between Red Top Road and Air Base Parkway prepared by Jones & Stokes for STA (STA 2006h)
- I-80 HOV Project, Red Top Road to Air Base Parkway Location Hydraulic Study & Summary Floodplain Encroachment Report prepared by Mark Thomas & Company, Inc. and Nolte Associates, Inc. for STA (STA 2006i)

- I-80 HOV Project, Red Top Road to Air Base Parkway, Storm Water Data Report (Draft) prepared by Mark Thomas & Company, Inc. and Nolte Associates, Inc. for STA (STA 2006j)

Because the majority of the project consists of adding lanes within an existing highway, some environmental resource areas are not affected by the proposed project and others will experience only very minimal effects.

2.1 Human Environment

2.1.1 Land Use

This section addresses the potential impacts of the proposed project on land use.

2.1.1.1 Existing and Future Land Use

All but approximately 1 mile of the 8.7-mile project area lies within the Fairfield city limits within Solano County. The remaining 1-mile stretch of I-80 passes through unincorporated agricultural land between West Fairfield and Fairfield. Land use along the portion of I-80 under consideration is primarily commercial, business related, and industrial, and agricultural (Figure 2-1). The parcels under agricultural use correspond with areas outside the Fairfield city limits.

2.1.1.1.1 Affected Environment

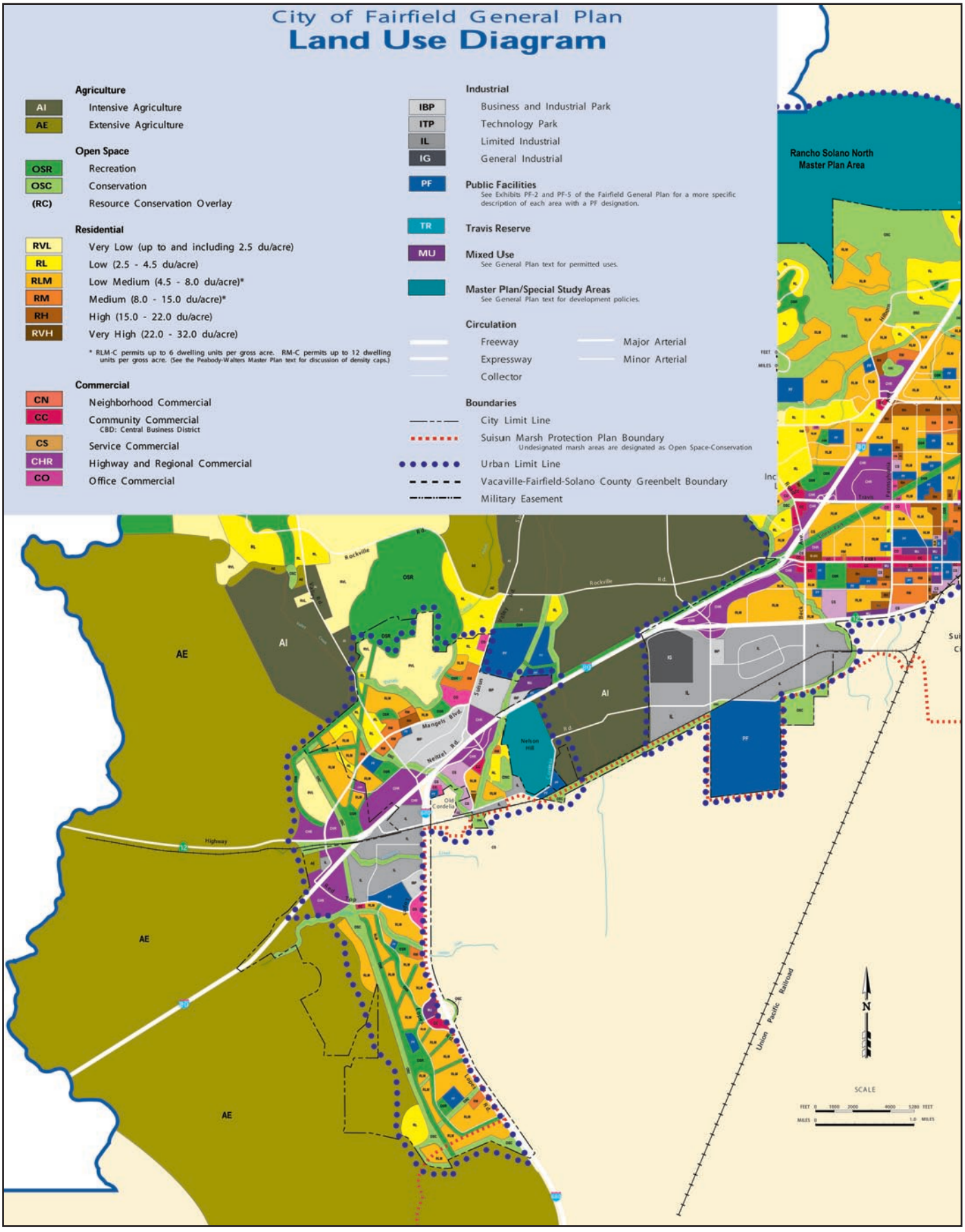
Although the existing land use within the project area is transportation, I-80 passes through areas zoned for commercial, industrial, recreational, open space, residential, and agricultural uses.

The land uses bordering the western portion of the project area, near the I-80/I-680 interchange, are highway and regional commercial and industrial. The portion of the land bordering I-80 between Suisun Creek and the I-80/SR 12 East interchange has intensive agricultural land uses. The area from the I-80/SR 12 East interchange to the intersection of I-80 and Rockville has mixed use and industrial land uses. Portions of this stretch of highway are also used for recreation, and the Fairfield Linear Park runs alongside I-80 for 2.7 miles on the north side of the highway. The eastern portion of the project corridor (from Rockville Road to the project's eastern terminus) runs through the urban area of Fairfield. This area has a variety of land uses including mixed use, low-, low medium-, and high-residential, community and service commercial, and open space/conservation.

The entire proposed project would be constructed within Caltrans right-of-way; therefore, there would be no change in land use as a result of the construction and operation of the proposed HOV lanes.

2.1.1.1.2 Impacts

The entire project would be constructed within Caltrans right-of-way along the existing route of I-80. The proposed project would not physically divide an established community. There would be *no impact*.



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Figure 2-1
Land Use Diagram

The existing land use within the project area is transportation, and the entire project would be constructed within Caltrans right-of-way. There will be no change in land use as a result of the project; therefore there would be *no impact*.

The proposed project would not involve the significant conversion of open space to non-open space land uses, or result in significant impacts on plant, fish, and wildlife species covered by a habitat conservation plan or natural community conservation plan. There would be *no impact*.

2.1.1.1.3 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization and/or mitigation measures are proposed as there would be no change in land use as a result of this project.

2.1.1.2 Consistency with State, Regional, and Local Plans

Land use within the project area is governed by the City of Fairfield (City) and Solano County (County).

2.1.1.2.1 City of Fairfield

The City of Fairfield General Plan (2000) has various objectives and policies that are important considerations for the adoption and implementation of the construction of the proposed project. In general, the following objectives and policies would be considered.

- Encourage land use development patterns and circulation and transportation systems, which minimize energy consumption.
- Provide and maintain a safe, economical and efficient system of roads, streets, and highways to ensure adequate multi-modal movement of people and goods within, to and from the County, while incurring the least social, economic, and environmental harm to existing or planned activities and land uses.
- Achieve a coordinated regional and local transportation system that minimizes traffic congestion and effectively serves users.
- Contribute toward improving the air quality of the region through more efficient use of private vehicles and increased use of alternative transportation modes.

2.1.1.2.2 Solano County

The Solano County General Plan Circulation and Transportation Element (1997) sets forth general policies, described below, that are important factors for the completion of the construction of the proposed project.

- Encourage research in transportation programs that ensure conservation, efficient utilization of energy resources, and investigation of alternative energy sources.
- Designate and reserve transportation right-of-way adequate to meet the projected traffic volumes as far in advance as possible in anticipation of new development.
- Conduct a continual evaluation of existing segments of the street and highway network in order to correct safety and/or congestion problems for better circulation.

Solano Comprehensive Transportation Plan

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 (STA 2004f??). The CTP 2030 incorporates various STA studies and plans into a 25-year planning document. One goal set forth in the CTP 2030 is to develop a plan and implementation program for an HOV system. One of the major elements would be the construction of HOV lanes on I-80 between I-680 and Cherry Glen Road.

Major Investment and Corridor Study (MIS)

The Major Investment and Corridor Study (STA 2004c) analyzes existing highway capacity and usage along the I-80/I-680/I-780 corridor and prioritizes a list of mid-term projects and long-term projects into the year 2030. Similar to the CTP 2030, the MIS also recommended the construction of HOV lanes in the project area to ease congestion along the I-80 corridor.

2.1.1.3 Parks and Recreation

The City of Fairfield operates a total of 26 parks, recreational facilities, and golf courses. There are no parks located within the project area. Recreational facilities in the area immediately adjacent to the proposed project include Fairfield Linear Park. This facility is a trail that runs alongside I-80 for 2.7 miles on the north side of the highway. It cuts through the middle of Fairfield from Rockville Road to North Texas Street and serves primarily as a commuter route between downtown Fairfield and Solano Community College.

The proposed project would be constructed entirely within the I-80 right-of-way. Therefore, there will be *no impact* to any parks or recreational facilities.

The proposed project and alternatives would not create any new residential, commercial, or industrial land uses and therefore would not create any new demand for parks. There would be *no impact*.

The proposed project and alternatives do not include or require the construction or expansion of recreational facilities. There would be *no impact*.

2.1.2 Utilities/Emergency Services

This section addresses the potential impacts of the proposed project on utilities and emergency services.

2.1.2.1 Existing Conditions

The City of Fairfield provides potable water to users within its corporate limits except Travis Air Force Base, which obtains its water from the City of Vallejo and base-owned wells. All water presently delivered by the City is surface water. The City distributes and treats its own water in two water-treatment plants and a city-operated water distribution system. Solano Garbage Company, a franchised hauler under contract with the City, handles solid waste management, including waste disposal and curbside recycling. Solid waste is taken to Potrero Hills Landfill, and recyclable materials are processed at an intermediary facility in Fairfield.

Electrical and natural gas services for the city of Fairfield are provided by PG&E, which is regulated by the California Public Utilities Commission. SBC provides telephone service to the city. AT&T Broadband provides cable television service to the city.

Buried utilities within the project corridor include natural gas lines, an aqueduct, and electrical utilities associated with the truck scales.

Police protection services in the project area are provided by the Fairfield Police Department, located in the Civic Center. The Fairfield Fire Department provides fire suppression services from five stations throughout the city. The Solano Emergency Medical Services Cooperative (SEMSC) provides emergency response to medical emergencies and prehospital care for the county.

2.1.2.2 Impacts

The proposed project would involve improvements to existing roadways (I-80) and would not involve the discharge of wastewater to existing wastewater facilities during construction or operation. Therefore it would not exceed wastewater treatment requirements of the Regional Water Quality Control Board (RWQCB) and there would be *no impact*.

The proposed project does not involve construction of curbs or storm drain gutters. Work would occur in the median; however, this would not result in significant changes to existing drainage patterns. This impact to existing stormwater drainage facilities is considered *less than significant*.

Operation of the proposed project and alternatives would not require the use of water for landscaping. There would be *no impact*.

The proposed project involves the addition of an HOV lane to an existing roadway and would not result in an increased amount of wastewater discharge. Therefore it will not affect the wastewater treatment provider that services the area. There would be *no impact.*

Solid waste present on site during construction would be stored and disposed of according to all relevant federal, state, and local statues.

Construction traffic, lane closures, or unforeseen delays could impede emergency response vehicles during construction of the proposed project. This impact is potentially significant. Implementation of the Mitigation Measure UTL-1 would reduce this impact to a *less-than-significant* level.

Construction associated with the proposed project may affect the provision of utilities. Utilities located within the project corridor include natural gas lines and an aqueduct, in addition to electrical utilities associated with the truck scales. Locations of these utilities have been noted and the project will not disturb either the natural gas pipelines or the aqueduct. Utilities associated with the truck scales will be relocated in association with the minor changes to that facilities noted in the project description. This will be a *less-than-significant* impact.

2.1.2.3 Avoidance, Minimization, and/or Mitigation Measures

Mitigation Measure UTL-1: Prepare Transportation Management Plan (TMP) to Notify Emergency Service Providers of the Construction Schedule and Any Associated Lane Closures

Before initiating construction, STA will prepare a Transportation Management Plan (TMP) that will be provided to all emergency service providers in the area. The TMP will serve to notify all emergency service providers in the project corridor of the project construction schedule. The TMP will identify anticipated dates and hours of construction, as well as any anticipated limits on access. Notice will be provided at least 5 days before construction begins. If a temporary lane or road closure or a detour is required, the city will notify emergency service providers of the closure or detour and the expected duration.

2.1.3 Traffic and Transportation

This section addresses the potential impacts of the proposed project on existing traffic and transportation. The information presented in this section is taken from the Draft Traffic Analysis Report prepared by Fehr & Peers for this project (STA 2006b).

2.1.3.1 Regulatory Setting

The Solano Comprehensive Transportation Plan calls for maintenance of level-of-service (LOS) E on roadways of regional significance, including freeways. LOS E represents *at-capacity* operation. When traffic volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.

2.1.3.2 Existing Conditions

The majority of I-80 between Red Top Road and Air Base Parkway has four mixed-flow lanes in each direction. In the westbound direction, an auxiliary lane has been added between Travis Boulevard and Oliver Road, and a fifth lane has been added from the SR 12 East connector to the I-680 southbound connector. In the eastbound direction, an auxiliary lane has been added between the SR 12 West connector and Green Valley Road, between Abernathy Road and Auto Mall Parkway, and between Beck Avenue and Travis Boulevard. The recently complete auxiliary lane project on eastbound I-80 between the northbound I-680 connector and the eastbound SR 12 East connector was not included in the traffic analysis. These improvements were completed in late October 2004, after data collection was conducted.

2.1.3.2.1 Existing Traffic Volumes

Vehicle occupancy counts collected in November 2005 reveal that in the morning peak hour, 15 percent of the total vehicles traveling westbound on I-80 are carrying two or more people (14 percent are two persons and 1 percent is 3+). Thirty percent of the total vehicles traveling eastbound on I-80 during the evening peak hour are carrying two or more people.

2.1.3.2.2 Existing Traffic Operations

During the AM peak hour, a queue typically develops on westbound I-80 at the SR 12 West connector primarily due to the grade on SR 12 West approaching the Red Top Road intersection. The queue results in LOS F operations on the shoulder lane, whereas the overall freeway section operates at LOS B.

The recent completion of the two-lane exit from westbound I-80 to southbound I-680 has eliminated the bottleneck at this location. Approaching the Suisun Valley Road off-ramp, the effects of trucks exiting and entering from the truck scales and weaving vehicles headed to the Suisun Valley Road off-ramp or southbound I-680 connector, results in slow moving queues in lane numbers 4 and 5 (the two outside lanes). The slow-moving queue on lanes 4 and 5 typically extends from the Suisun Valley Road westbound off-ramp to SR 12 East.

During the PM peak hour, a bottleneck develops on eastbound I-80 at the truck scales on-ramp where slow moving trucks attempt to accelerate to freeway travel speeds. Vehicle speeds generally begin to increase beyond the truck scales towards the I-80/SR 12 East interchange. The bottleneck constrains the amount of traffic that can be delivered downstream, thereby resulting in improved LOS operations immediately eastward of the bottleneck. Vehicle queues resulting from the eastbound bottleneck at the truck scales on-ramp typically extend as far west as SR 12 West and 800 feet south of the Central Way off-ramp on northbound I-680. The congestion results in LOS F conditions at the freeway mainline sections listed below:

- Eastbound I-80, between SR 12 West connector and I-680 Southbound/Lopes Road off-ramp;
- Eastbound I-80, between Northbound I-680 to Eastbound I-80 connector and Pittman Road off-ramp;
- Eastbound I-80, between Pittman Road on-ramp and truck scales off-ramp; and
- Northbound I-680, between Central Avenue and the northbound I-680 to eastbound I-80 connector.

Another bottleneck during the PM peak hour on eastbound I-80 occurs between the Travis Boulevard on-ramp and the Air Base Parkway off-ramp. This bottleneck results in vehicle queues that extend back to the Beck Avenue interchange resulting in LOS F operations between the Beck Avenue eastbound on-ramp and the Travis Boulevard eastbound on-ramp.

I-80 segments within the project area generally operate at LOS D or better with the exception of the following segments:

- Westbound I-80 between the truck scales and Suisun Valley Road (AM);
- Eastbound I-80 between SR 12 West and the truck scales (PM); and
- Eastbound I-80 between Beck Avenue and Travis Boulevard (PM).

Ramp junctions tend to operate worse than the freeway segments. The following on-ramp merge sections currently operate at unacceptable service levels (STA 2006b):

- Westbound I-80 on-ramp from Chadbourne (AM Peak Hour), LOS F;
- Westbound I-80 on-ramp from truck scales (AM Peak Hour), LOS F;
- Westbound I-80 connector from northbound I-680 (AM Peak Hour), LOS F;

- Westbound I-80 on-ramp from Green Valley Road (AM Peak Hour), LOS F;
- Eastbound I-80 on-ramp from truck scales (PM Peak Hour), LOS F; and
- Eastbound I-80 on-ramp from Travis Boulevard (PM Peak Hour), LOS F.

The following off-ramp diverge sections currently operate at unacceptable service levels:

- Westbound I-80 off-ramp to Neitzel Road/Suisun Valley Road (AM Peak Hour), LOS F; and
- Westbound I-80 off-ramp at Jamison Canyon Road/SR 12 West (AM Peak Hour), LOS F.

2.1.3.2.3 Accident Data Summary

Accident data from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) for the period from January 1, 2002, to December 31, 2004, was evaluated. The accident rate for I-80 between Red Top Road and Air Base Parkway exceeds the average rate for similar facilities by 23 percent (total). In the eastbound direction, the majority of the accident rates are two to three times higher than the average rate for similar facilities. In both directions, approximately 50 to 60 percent of the accidents occurred during peak commute periods and the majority were rear-end collisions.

2.1.3.3 Impacts

The construction of the HOV lanes will increase the freeway capacity along I-80 by up to 20 percent and the person-carrying capacity by more than 45 percent. Traffic on this segment of I-80 during commute times already exceeds the design capacity of the roadway. The construction of the HOV lanes will increase capacity to the extent that it will accommodate existing traffic flow. The construction and operation of the HOV lanes will not result in a substantial increase in traffic flows. Therefore there would be *no impact*.

The construction of the proposed project would not cause an exceedance of the level-of-service standard established by Solano County. The construction of HOV lanes in the east and westbound directions on I-80 between Red Top Road and Air Base Parkway would not only improve operations on I-80, but will improve conditions on parallel arterials as well. The reduction in delay for all vehicles and the increased speed on the freeway would reduce the amount of cut-through traffic that uses parallel facilities such as Rockville Road, Cordelia Road, and the North Connector (a future roadway). There would be *no impact*.

The proposed project is not within an airport sphere of influence and therefore will not result in a change in air traffic patterns or levels. There would be *no impact*.

The proposed project is designed to implement operational and safety improvements along the project corridor. Design features would be included to eliminate or reduce hazards. This impact is considered *less than significant*.

To facilitate the execution of emergency response activities, adequate traffic circulation would be provided during construction. Though most construction would occur in the median of the highway, there is the potential for temporary traffic disruptions in areas of highway widening and on West Texas Street during bridge construction that could cause potentially significant

impacts on the provision of emergency response services, including fire protection and police services. Implementation of Mitigation Measure UTL-1, as described in section 2.1.2, Utilities/Emergency Services," would reduce the impact to a *less-than-significant* level.

The proposed project and alternatives would not create a need for any additional parking and would not remove existing parking. There would be *no impact*.

The proposed project is consistent with the Solano Comprehensive Transportation Plan (STA 2005b), the Major Investment and Corridor Study for the I-80/I-680/I-780 corridor (STA 2004a), the Circulation Element of the Fairfield General Plan, and the Transportation 2030 Plan (February 2005), Reference #21807. There would be *no impact*.

2.1.3.4 Avoidance, Minimization, and/or Mitigation Measures

No additional avoidance, minimization and/or mitigation measures are proposed. Impacts to emergency access are addressed in Mitigation Measure UTL-1 above.

2.1.4 Visual/Aesthetics

This section addresses the potential impacts of the proposed project on visual resources. The information presented in this section is taken from the Abbreviated Visual Impact Assessment prepared by CirclePoint (STA 2006c).

2.1.4.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings [42 U.S.C. 4331(b)(2)]. To further emphasize this point, the Federal Highway administration in its implementation of NEPA [23 U.S.C. 109(h)] directs that final decisions regarding 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.

In addition, 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 Section 21001(b)]

The project area is located within the jurisdictions of the City of Fairfield and Solano County, but is also subject to state regulations because it is within Caltrans right-of-way. There are no guidelines regulating visual resources set forth by the City of Fairfield General Plan that apply to the proposed project.

2.1.4.2 Existing Conditions

The project area lies east of the hilly to very steep mountain uplands of the Coast Ranges, characterized by Northwest-trending ridges and valleys. Interstate 80 is a crucial east/west connector between the San Francisco Bay Area, Sacramento, the Sierra Nevada Range, and regions eastward across the country. The proposed project involves the section of I-80 between Red Top Road and Air Base Parkway within Fairfield. This thoroughfare is viewed daily by

those that use I-80 including area residents and commuters from the Fairfield region and beyond. Although the project alignment is confined to flat terrain ranging in elevation from 16 to 39 feet above sea level and is flanked in some places by sound walls and clusters of multi-story commercial buildings, views of adjacent and distant hills are afforded motorists traveling on I-80.

Existing land uses along this stretch of I-80 vary and include a mix of highway-serving businesses, industrial uses, commercial businesses, residential areas, and farmland. Commercial uses are clustered around interchange areas. The portion of the study area between Suisun Creek and the I-80/SR 12 East interchange is mainly farmland. Within the project limits I-80 crosses over four creeks: Green Valley Creek, Dan Wilson Creek, Suisun Creek, and Ledgewood Creek, all of which flow southeast toward Suisun Bay.

With the exception of the riparian habitat that lines these creek channels, areas near the highway have limited habitat value and often consist of plant species that have either been deliberately planted or have escaped from cultivation. Long stretches of the I-80 median within the project area are planted with non-native oleander (*Nerium oleander*). Currently, the segment of I-80 that extends from approximately West Texas Street to Air Base Parkway is classified as a Landscaped Freeway, which is a section of freeway with planting that meets the criteria of Caltrans outdoor advertising regulations (California Department of Transportation 2004). These regulations are typically used in the control and regulation of outdoor advertising displays.

2.1.4.3 Impacts

There are no scenic vistas in the project area. The project area is a 8.7-mile stretch of I-80 that is confined to flat terrain. Existing land uses along this stretch of I-80 vary and include a mix of highway-serving businesses, industrial uses, commercial businesses, and farmland. Commercial uses are clustered around interchange areas, with farmland concentrated mainly along the portion of the study area between Suisun Creek and the I-80/SR 12 East interchange. There would be *no impact*.

I-80 is not a designated scenic highway (California Department of Transportation 2001), and there are no scenic vistas or historic structures that would be affected by the project. There would be *no impact*.

The proposed project involves the addition of HOV lanes within the median of I-80. The work would include widening the highway within the existing right-of-way at several locations and widening bridges over three watercourses and one street. The proposed project does not involve cut or fill slopes or structural additions that would significantly alter the existing visual character of the project area.

Existing vegetation and other features within the median would be removed and paved over during construction and replaced with pavement for the new lanes and a concrete median barrier (Figure 2-2). The primary visual effect of the proposed project would be due to the removal of approximately 3.5 linear miles of oleanders that exist in the freeway median. This impact is less than significant with the implementation of Mitigation Measure VR-1.



Existing View of the Project Alignment from Eastbound I-80



Simulated View of the Project Alignment from Eastbound I-80

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Figure 2-2
Visual Simulation

The proposed project would not involve improvements that would increase daytime or nighttime glare. There is no additional lighting planned in conjunction with the proposed project. The oleander in the existing highway median, which provides a visual screen, would be removed as part of the project. This would result in increased visibility of the sun reflected off oncoming cars, and thus increase daytime glare. However, since this condition exists throughout the I-80 corridor, this impact would be *less than significant*.

As described above, the visual screen provided by the existing oleanders planted in the median of I-80 would be eliminated during the proposed project. Headlights from oncoming vehicles would be visible along the entire project alignment, creating a new source of light at nighttime. However, since this condition currently exists throughout the I-80 corridor and along much of the project area, this impact would be *less than significant*.

2.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

Removal of approximately 3.5 miles of oleander from the median of I-80 can be mitigated if planting is replaced at or near the location where it is removed.

Mitigation Measure VR-1: Replace oleander at or near the location where it is removed.

It is Caltrans policy to replace highway planting, including oleander median planting, at or near the location where it is removed. If there is no room for replacement after construction, then another area within the project limit should be identified or a suitable location outside the project limit. Caltrans policy includes consideration for replacement outside of Caltrans right of way if no suitable area is available inside Caltrans right of way as long as the local community agrees to the permanent maintenance of the landscape improvements. Using the current formula which calculates oleander median planting at $120,000 plus a10% increment of $12,000 = $132,000 (per mile) x 5.47 kilometers (3.4 miles) of landscape that would be removed= $448,800 in replacement highway planting. This amount should be set aside in the construction budget for replacement planting costs. Replacement planting scope should be defined in the project report or supplemental project report with a budget sufficient to install $448,800 of plants and irrigation. This project will be a separate construction contract with three years of plant establishment.

2.1.5 Topics Not Analyzed

As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered, but no adverse impacts were identified. Consequently, there is no further discussion regarding these issues in this document.

2.1.5.1 Community Impacts

The construction of HOV Lanes on I-80 does not have the potential to affect the community character or cohesion of Fairfield or the county, nor does it have the potential to result in relocations of people or residences. The project will not have an impact on low-income or minority populations. The project area is entirely within the highway right-of-way and would

not affect the community except to ease highway congestion, reduce commute times of residents, and potentially decrease traffic on city streets.

2.1.5.2 Cultural Resources

Caltrans has determined that this project would have no potential to impact historical resources (Caltrans 2005). The undertaking has been determined exempt under Class 2 (minor widening of less than one-half-lane width, adding lanes in the median, or adding paved shoulders), Class 5 (minor modification of interchanges and realignments of on/off ramps), Class 19 (any work on Category 5 bridges that are less than 50 years of age, including rehabilitation or reconstruction) of Attachment 2, "Screened Undertakings" of the January 2004 Programmatic Agreement (FHWA 2004).

2.1.5.3 Farmlands and Timberlands

The project does not have the potential to result in impacts to farmlands or timberlands. There are no timberlands in the vicinity of the project area. Though a portion of the project runs through farmlands, all project activities would take place within Caltrans right-of-way on I-80. No farmlands would be converted.

2.1.5.4 Growth

The proposed project would not induce or impede growth in the project vicinity. The project adds HOV lanes and is intended to provide an alternative to single-occupancy vehicle travel along I-80, particularly during commute hours. It does not add excess capacity to I-80 or create a situation for traffic that would induce growth. The addition of HOV lanes is consistent with the expansion of HOV lanes throughout the Bay Area and with local and regional transportation planning and would not result in demand for additional facilities such as parks and schools.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

2.2.1.1 Regulatory Setting

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

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments;
- Risks of the action;
- Impacts on natural and beneficial floodplain values;
- Support of incompatible floodplain development; and

- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.

The 100-year 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 100-year floodplain."

2.2.1.2 Existing Conditions

The existing hydrologic and floodplain conditions in the project area are based on the I-80 HOV Project Red Top Road to Air Base Parkway Location Hydraulic Study & Summary Floodplain Encroachment Report prepared by Mark Thomas & Company, Inc. and Nolte Associates Inc. (STA 2006i).

The project area has a Mediterranean-like climate consisting of dry summers and wet winters, with precipitation occurring mostly in the form of rain from October through April. The mean annual precipitation in the project area is approximately 26 inches per year. The topography in the project vicinity comprises plains and hills that gradually slope to the south toward Suisun Bay. Land uses adjacent to the project area are a mixture of developed commercial and residential uses and undeveloped agricultural uses.

Eight watersheds intersect the project area and drain a total area of approximately 95 square miles. The watersheds include the following drainages, which generally flow south from the Vaca Mountains to Suisun Marsh and Suisun Bay: Green Valley Creek, Dan Wilson Creek, Suisun Creek and Raines Drain, Ledgewood Creek and Alonso Drain, Pennsylvania Avenue Creek, and Union Avenue Creek. Four of the eight drainages (Green Valley Creek, Dan Wilson Creek, Suisun Creek, and Ledgewood Creek) cross the highway under bridges. Raines Drain, Alonso Drain, and Pennsylvania Avenue Creek cross the highway in concrete culverts. Union Avenue Creek parallels the highway in a trapezoidal channel.

2.2.1.2.1 Green Valley Creek

The Green Valley Creek floodplain area was modified in a Letter of Map Revision (LOMR) dated July 12, 1996. The LOMR reduced the Green Valley Creek water surface elevation and 100-year flood width at I-80 so that the flood is contained in the existing natural stream banks and passes under the I-80 Bridge.

2.2.1.2.2 Dan Wilson Creek

An LOMR dated August 5, 2004, reduced the Dan Wilson Creek water surface elevation and 100-year flood width at I-80 so that the flood is contained in the existing natural stream bank and passes under the I-80 bridge.

2.2.1.2.3 Suisun Creek and Raines Drain

The 100-year flow in Suisun Creek passes under the I-80 bridge without flooding the highway. However, at several locations within 3 kilometers upstream of I-80, 100-year flows escape from the banks of Suisun Creek, flowing away from the creek. Some of these flood flows encounter the I-80 embankment at Raines Drain. The capacity of the Raines Drain cross culverts is not sufficient to carry the 100-year flood flows across the highway, causing flood flows to overtop

the highway at this location, as defined on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM).

2.2.1.2.4 Ledgewood Creek and Alonso Drain

The 100-year flow in Ledgewood Creek also passes under the I-80 bridge without flooding the highway. However, at several locations within 3 kilometers upstream of I-80, 100-year flows escape from the banks of Ledgewood Creek and flow away from the creek. Some of the flood waters flowoverland toward the west and south reaching the I-80 embankment at Alonso Drain. The capacity of the Alonso Drain cross culvert is insufficient to convey the 100-year flood flows across the highway. This could cause flood flows to overtop the highway at this location, as defined on the FEMA FIRM maps.

2.2.1.2.5 Pennsylvania Avenue Creek

The 100-year flow in Pennsylvania Avenue Creek is completely contained in the I-80 cross culvert without flooding the highway as shown on the FEMA FIRM maps.

2.2.1.2.6 Union Avenue Creek

The 100-year flow in Union Avenue Creek is also completely contained in the I-80 cross culvert east of the project limits and in the open channel parallel to the highway embankment within the project limits without flooding the highway, as shown on the FEMA FIRM maps.

Pennsylvania Avenue, Ledgewood, Dan Wilson, Green Valley, Suisun, and Union Avenue Creeks have sufficient capacity to contain 100-year flood flows at the project area and not flood onto the highway. However, Alonso Drain and Raines Drain currently do not have sufficient capacity to convey the 100-year flows, which would flood the highway. These conditions are defined on the FEMA floodplain maps provided in the Hydraulic Study and Summary Floodplain Encroachment Report.

2.2.1.3 Impacts

The following impact discussions are based on the I-80 HOV Project Red Top Road to Air Base Parkway Location Hydraulic Study & Summary Floodplain Encroachment Report prepared by Mark Thomas & Company, Inc. and Nolte Associates Inc. (STA 2006j).

Placement of new pavement as part of the project could increase the quantity of impermeable surfaces and therefore runoff flows in the project area. The western half of the project area median is already paved so the project would not increase the existing flow peak or volume in this area. However, along the eastern half of the project area, a portion of the existing median is unpaved and would be converted to an impervious surface, causing a slight increase in peak runoff and volume). The median drainage improvements would redirect some median runoff to sheet flow to the outside edge of the existing pavement where the existing drainage devices would collect and convey the slightly increased runoff amounts . These existing concentrated flow devices include: lined and unlined ditches and swales, drainage inlets, culverts, asphalt concrete dikes and oversized drains, flared end sections, flow energy dissipation devices, and other approved drainage design devices. The existing drainage devices would have capacity to handle the minor increase in runoff as a result of the project. This impact would be *less than significant*. (STA 2006j.)

Pier wall extensions would be implemented at the crossing of the highway and Green Valley Creek and at the crossing of Suisun Creek and the highway. In addition, six columns would be added at the Ledgewood Creek and highway crossing. No other modifications to the eight creek channels or culverts would occur. The project would not modify the hydrology or hydraulics of the eight local drainages or substantially alter the existing drainage pattern. This impact would be *less than significant*.

The project would not involve construction of housing in the local 100-year floodplains. There would be *no impact*.

Alterations to the creek channels or culverts, or placement of additional structures in the flow paths could potentially affect flood flows. The project would not modify the existing creek banks or beds. Highway improvements at Pennsylvania Avenue Creek, Union Avenue Creek, and Dan Wilson Creek would be constructed outside of the 100-year floodplain. Concrete pier wall extensions at Green Valley Creek and Suisun Creek and placement of new columns at Ledgewood Creek would not affect flood flows or existing upstream or downstream conditions.

At Raines Drain and Alonso Drain, the two locations where the existing 100-year floodplain crosses over the highway, the HOV improvements would have a slight impact on the floodplain. The FEMA FIRM maps indicate that the 100-year floodplain crosses over the highway at a low point in the pavement at Raines Drain. There is an existing metal barrier at the location of the overtopping, which would be rebuilt as part of the project improvements. The elevation of the inside edge of the EB and WB bridge would be slightly affected by the pavement reconstruction and would increase by approximately one inch. This minimal rise in the pavement elevation would not have a significant effect on the adjacent floodplain elevation. The FEMA FIRM maps for Alonso Drain indicate that the 100-year floodplain overtops the highway. However, there is an existing, continuous median concrete barrier at the site of the overtopping, and the flood elevation suggested by the FIRM maps would not overtop the concrete barrier. The existing barrier would be removed as part of the project and replaced with a new concrete barrier at an elevation less than two inches higher than the existing barrier. The adjacent floodplain elevation would not be significantly affected by this rise in the median barrier. Therefore, the project would have a *less-than-significant impact* on the 100-year floodplain.

The project is not downstream of any dams or large bodies of water (as it is located approximately 8 miles north of Suisun Bay) and would not pose any risk of flooding hazards as a result of dam failure. Although levees line some of the creeks crossing the highway, the risk of a levee failure significantly affecting people or structures would be low. There would be *no impact*.

The project area is located in an area of relatively flat topography that is not near any large bodies of water (Suisun Bay being located approximately 8 miles to the south) The potential for a seiche, tsunami, or mudflow is low. There would be *no impact*.

2.2.1.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are proposed.

2.2.2 Water Quality and Stormwater Run-Off

2.2.2.1 Regulatory Setting

2.2.2.1.1 Clean Water Act

The federal Clean Water Act (33 U.S. Government Code 1251–1376), as amended by the Water Quality Act of 1987, is the major federal legislation governing water quality. The objective of the Clean Water Act (CWA) is "to restore and maintain the chemical, physical, and biological integrity of the Nation's water." Applicable sections of the act are listed below.

- Sections 303 and 304, which provide for water quality standards, criteria, and guidelines.
- Section 401, which requires an applicant for any federal permit that proposes an activity that may result in a discharge to "waters of the United States" to obtain certification from the state that the discharge will comply with other provisions of the act. Certification is provided by the regional water quality control board.
- Section 402, which establishes the National Pollutant Discharge Elimination System (NPDES), a permitting system for the discharge of any pollutant (except for dredge or fill material) into waters of the United States. This permit program is administered by the applicable regional water quality control board, and is discussed further below.

2.2.2.1.2 Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) establishes nine regional water quality control boards and provides the basis for water quality regulation within California. The act requires a Report of Waste Discharge for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair a beneficial use of surface or groundwater of the state. Beneficial uses are discussed below. Waste discharge requirements are issued by the applicable regional water quality control board.

2.2.2.1.3 State Water Resources Control Board

The California Environmental Protection Agency has delegated administration of the federal NPDES program to the State Water Resources Control Board and nine regional water quality control boards. The project is located within the jurisdiction of the State Water Resources Control Board (State Water Board) and the San Francisco Bay Regional Water Quality Control Board (SFRWQCB).

The State Water Board issues the Statewide Permit for all of Caltrans' construction activities of 1 acre or greater, or for a number of smaller projects that are part of a common plan of development with the total area exceeding 1 acre, or for projects that have the potential to significantly impair water quality. Caltrans projects subject to the Statewide Storm Water Permit require a Storm Water Pollution Prevention Plan (SWPPP), whereas projects smaller than 1 acre require a Water Pollution Control Program (WPCP).

The Fairfield–Suisun Sewer District and the cities of Fairfield and Suisun City have joined together to acquire and maintain a single NPDES permit in the name of Fairfield–Suisun Urban Runoff Management Program (FSURMP), which discharges stormwater to Suisun Bay.

Subject to Caltrans review and approval, the contractor prepares both the SWPPP and the WPCP. The WPCP and SWPPP identify construction activities that may cause pollutants in stormwater and measures to control these pollutants. Because neither the WPCP nor the SWPPP is prepared at this time, the following discussion focuses on anticipated pollution sources or activities that may cause pollutants in the stormwater discharges.

Additional laws regulating water quality include the Safe Drinking Water Act and Pollution Prevention Act. State water quality laws are codified in the California Water Code, Health and Safety Code, and Fish and Game Code Section 5650-5656.

2.2.2.2 Existing Conditions

The following discussion, unless otherwise specified, is based on information taken from the I-80 HOV Project Red Top Road to Air Base Parkway Storm Water Data Report, prepared by Mark Thomas & Company, Inc. and Nolte Associates Ltd. (STA 200bj).

The project is located in the Suisun Hydrologic Unit and the Fairfield Hydrologic Area, which contain three Hydrologic Sub-Areas as defined on the Caltrans Storm Water Management web site: Sub-Area 207.21, Benicia; Sub-Area 207.22, Suisun Creek; and Sub-Area 207.23, Suisun Slough. Within these hydrologic sub-areas are five water bodies (Green Valley Creek, Pennsylvania Avenue Creek, Dan Wilson Creek, Suisun Creek and Ledgewood Creek) and two drains (Raines Drain and Alonzo Drain) that cross the project. Runoff flows in the project area are directed to unlined ditches, with some of the ditches discharging to the creeks. Water bodies downstream of the creeks that cross the project limits, and ultimately receive discharge from the creeks, include the Suisun Marsh wetlands, Suisun Bay and the Carquinez Strait.

Green Valley Creek, Suisun Creek, Ledgewood Creek, Suisun Bay, and Carquinez Strait have designated beneficial uses by the SFRWQCB. Existing and potential beneficial uses of the creeks are similar and include cold freshwater habitat; freshwater replenishment; fish migration (except at Green Valley Creek); non-contact and contact water recreation; fish spawning; warm freshwater habitat; and wildlife habitat. Carquinez Strait's and Suisun Bay's beneficial uses include ocean, commercial and sport-fishing; estuarine habitat; industrial service supply; fish migration; navigation; preservation of rare and endangered species; non-contact and contact water recreation; fish spawning; and wildlife habitat. (SFRWQCB 2004.)

The Suisun Marsh wetlands, Suisun Bay and the Carquinez Strait each contain several CWA Section 303(d)-listed pollutants of concern including organic compounds, PCBs, mercury, selenium, general particulate and dissolved metals, nutrients, and salinity. Of the waterways that cross the project area, only Ledgewood Creek has a Section 303(d)-listed pollutant of concern (diazinon) but this pollutant is not present within the highway right-of-way. There are no known special requirements or concerns of the SFRWQCB besides the Section 303(d) listings for pollutants of concern and there are no known local agency requirements or concerns for water quality that are not already defined by the SFRWQCB.

A variety of concentrated flow devices exist along the length of the project and include: lined and unlined ditches and swales, drainage inlets, culverts, asphalt concrete dikes and oversized drains, flared end sections, flow energy dissipation devices, and other approved drainage design devices. Through most of the project area, regularly spaced inlets capture and drain storm runoff

from the narrow median to ditches along the outside right-of-way. The median is paved along the western half of the project area. In the eastern half of the project area, a portion of the median is unpaved and planted with oleander.

Only two locations within the project area have significant cut slopes along the highway. These include the western-most end of the project in the vicinity of the SR 12 West interchange and between Dan Wilson Creek and the truck scales.

Groundwater levels near the project area are relatively shallow and have historically ranged from approximately 2 to 15 feet below the ground surface (DWR 2006). Groundwater quality in the project area may be impaired for petroleum hydrocarbons, VOCs, or pesticides, including diazinon.

2.2.2.3 Impacts

The following discussion is based on information taken from the Storm Water Data Report prepared by Mark Thomas & Company, Inc. and Nolte Associates, Ltd (STA 2006j).

Construction-related activities for the proposed project would consist primarily of grading, repaving, and restriping but would also include construction of temporary cofferdams at both upstream and downstream locations and installation of a pipe diversion system as part of the bridge-widening activities. These activities could disturb soils and increase the potential for erosion or accidental releases of chemicals or other contaminants, including non-stormwater discharges, to drainage channels. During the project's proposed excavation activities, groundwater would likely be encountered and could potentially impact the quality of local surface waters if dewatering activities discharged contaminated groundwater into surface waters.

During post-construction, the new paved surfaces of the project area may potentially affect water quality as a result of increased nonpoint-source pollutant loads. Specifically, roadways are known to contribute "first flush" pollutant loads of metals, nutrients, oils, grease, bacteria, and other non-specific pollutants. Without proper runoff controls, these pollutants may result in impacts to designated beneficial uses of the receiving water bodies. Approximately 56% of the linear outside shoulder frontage does not concentrate pavement runoff, but allows sheet flow to flow off of the pavement. In these areas, the sheet flow could result in significant impacts to the beneficial uses of the receiving water bodies. To minimize this impact and the potential construction-related impacts of spills, erosion, or dewatering activities on surface or groundwater quality, Mitigation Measures WQ-1 and WQ-2 described in section 2.2.2.4, Avoidance, Minimization, and/or Mitigation Measures, would be implemented. Consequently, the proposed project is not expected to violate any water quality standards or waste discharge requirements. This impact is considered *less than significant with mitigation*.

The proposed project involves improvements to an existing roadway. The existing drainage is handled by roadside ditches that generally drain to the south. The new roadway profile would match the existing roadway profile, resulting in very similar drainage patterns. The proposed project does not involve altering the course of a stream or river.

Implementation of the project would not significantly reduce the quantity of permeable surfaces available for groundwater recharge. The project area is adjacent to a number of agricultural

fields or open space that would continue to allow groundwater recharge. In addition, the project would not consume groundwater during project construction or operation. There would be *no impact*.

Substantial alterations of the existing drainage pattern of the project area could result in substantial erosion or siltation onsite or offsite. The project would have a very minor impact on the velocity or volume of downstream flow, but would not result in a significant change in the existing erosion. The project would result only in minor hydraulic changes and only in the eastern half of the project area. Overside drains and inlets along the outside shoulder would have a slightly greater tributary area once the HOV lanes are constructed. The capacities of these inlets and overside drains would be checked but the downstream ditches and channels would receive the same flows.

Implementation of the project would eliminate the existing median drains and the stormwater runoff would enter the same ditches that currently capture runoff. The western half of the project area median is already paved, so there would be no increase in flow peak or volume. Along the eastern half of the project area, a portion of the existing median is unpaved and would be converted to an impervious surface, causing a slight increase in peak runoff and volume. Along this eastern reach of the highway, the runoff would discharge into concrete-lined roadside ditches. Therefore, the project's drainage alterations would not result in significant erosion or siltation onsite or offsite. This impact is *less than significant*.

The proposed project would not result in substantial alteration of the drainage pattern of the corridor or area. Erosion in disturbed areas during construction activities would be controlled by employing grading operations that eliminate direct routes for conveying runoff to drainage channels, constructing erosion control barriers, such as silt fences and mulching material, and reseeding disturbed areas with grass or other plants. Throughout construction activities, the general contractors and subcontractors would be responsible for constructing or implementing, and regularly inspecting, the erosion control measures. This impact is considered *less than significant*.

The proposed project involves adding additional paved area to an existing roadway. The resulting increase in impervious surfaces would result in more surface runoff during storm events, but the effect would be minimal and would not cause a significant increase in the rate or amount of surface runoff or contribute to flooding or stormwater flows that exceed the capacity of the existing stormwater management system. This impact is considered *less than significant*.

As described in section 2.2.1, Hydrology and Floodplain, the project would involve adding additional paved area to an existing roadway, but would not substantially increase the runoff flows or volumes. In addition, the project would include Design Pollution Prevention and Treatment BMPs to treat and control polluted runoff and minimize the impacts on the existing water quality of creeks and drains in the project area. Therefore, the project would not create flows that would exceed the capacity of the proposed stormwater management system or create a substantial additional source of polluted runoff. There would be *no impact*.

2.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

STA will specify grading and erosion control best management practices (BMPs) and measures necessary to prevent water quality impacts in the final construction plans. STA will implement such measures according to the applicable Caltrans, County, or the FSURMP NPDES stormwater permits and the associated SWPPPs.

Mitigation Measure WQ-1: Prepare a Storm Water Pollution Prevention Plan (SWPPP)
Prior to construction, a SWPPP shall be prepared, as required by Caltrans. This document shall include a Section 600 Sampling and Analysis Plan, a Spill Contingency Plan, and a dewatering and discharge plan to be prepared by the construction contractor for the excavation work. The SWPPP will also specify Construction Site and Design Pollution Prevention BMPs, which may include but not be limited to:

- Drainage inlet protection
- Erosion control measures
- Silt fencing
- Concrete washout facilities

During construction, the general contractors and subcontractors would be responsible for constructing or implementing, and regularly inspecting, the erosion-control measures identified in the SWPPP. Erosion control measures could include grading operations that eliminate direct routes for conveying runoff to drainage channels, constructing erosion control barriers such as silt fences and mulch material, and reseeding disturbed areas with grass or other plants.

The Spill Contingency Plan in the SWPPP will identify appropriate hazardous materials management practices to reduce the possibility of chemical spills or releases of contaminants, including non-stormwater discharges to drainage channels. The construction contractors and subcontractors would be required to implement and maintain the identified hazardous materials management practices, and implement spill control and response measures, if necessary.

Because the quality of groundwater in the project area is uncertain, groundwater quality will be ascertained by determining if any contaminant spills were recorded in the Environmental Data Resources database and by verifying the local land-use history with the Office of Environmental Engineering. The dewatering and discharge plan will be prepared following the groundwater quality analysis and must include a description of the discharge location, discharge characteristics, primary pollutants, receiving water, treatment systems, spill contingency plans, and other measures necessary to comply with discharge limits. The dewatering and discharge plan will also describe measures to store and test groundwater and treat, if necessary, prior to disposal to any surface water bodies. Discharges during dewatering activities will be conducted in accordance with the San Francisco RWQCB's Basin Plan and NPDES requirements.

Mitigation Measure WQ-2: Implementation of Appropriate Operation-related BMPs
The targeted design constituents for this project are metals. Fifty-six percent of the Water Quality Velocity (WQV) and Water Quality Flow (WQF) will be treated. This is because 56% of the linear outside shoulder frontage does not concentrate pavement runoff, but allows sheet

flow off of the pavement. This sheet flow crosses over several meters of grass-covered area before entering a drainage swale or ditch. These existing areas could be considered treatment biostrips.

Approximately 98% of the HOV project is located in the median, offering no opportunities for placement of Treatment BMPs. However, with the large percentage of the highway outside edge of pavement providing sheet flow runoff beyond the pavement, these existing vegetated areas could be considered effective biostrips. It is recommended that the existing vegetation be evaluated for use as effective bioswale cover, or the project should establish the appropriate vegetative cover.

Biostrips are recommended throughout the project. Much of the area beyond the pavement is flat and wide enough to support stable and effective biostrips. Plans and tables in the Treatment BMP Summary appended to the technical report identify all proposed locations.

The tributary area to the biostrips is the length of pavement from the highway median to the outside edge of the pavement. This length is typically 25 meters for the HOV project, with additional width at ramps and auxiliary lanes. With regard to depth of flow and velocities at Design Storm Flow and WQF, biostrips are designed to provide the maximum treatment length; WQF is not designed for this BMP.

2.2.3 Geology/Soils/Seismic/Topography

The information below is summarized from the project's Preliminary Geotechnical Report, Interstate 80 HOV Improvement Solano County, California, 04-Sol-80 KP 18.3/32.3 prepared by Parikh Consultants, Inc. (STA 2006a). This report is available for review at the Caltrans District 4 office. This section address construction-related and long-term hazards and effects on geologic resources.

2.2.3.1 Regulatory Setting

Several federal, and state laws and regulations, and local policies, codes, and ordinances regarding geology and soils have been established for geologic hazards to people and property.

2.2.3.1.1 Federal

Section 402 of the Clean Water Act/National Pollutant Discharge Elimination System

The federal Clean Water Act (CWA) is discussed in detail in section 2.2.2, Water Quality and Storm Water Run-Off. However, because CWA Section 402 is directly relevant to excavation and grading, additional information is provided here.

Amendments in 1987 to the CWA added Section 402(p), which establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. As described in the "Water Quality and Stormwater Runoff" section 2.2.2, the U.S. Environmental Protection Agency (EPA) has delegated to the State Water Resources Control Board the authority for the NPDES program in California, which is implemented by the state's nine Regional Water Quality Control Boards (RWQCBs). Under the NPDES Phase II Rule, any construction activity disturbing 1 acre or more

must obtain coverage under the state's General Permit for Storm Water Discharges Associated with Construction Activity (General Permit). General Permit applicants are required to prepare a Notice of Intent and a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP includes pollution prevention measures (erosion and sediment control measures and measures to control non-stormwater discharges and hazardous spills), demonstration of compliance with all applicable local and regional erosion- and sediment-control standards, identification of responsible parties, a detailed construction timeline, and a best management practices (BMPs) monitoring and maintenance schedule. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants.

2.2.3.1.2 State

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code [PRC] Section 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (Earthquake Fault Zones). It also defines criteria for identifying active faults, giving legal weight to terms such as *active*, and establishes a process for reviewing building proposals in and adjacent to Earthquake Fault Zones.

Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the Alquist-Priolo Act as referring to approximately the last 11,000 years). A fault is considered well defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment (Hart and Bryant 1997).

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC Section 2690–2699.6) is intended to reduce damage resulting from earthquakes. Whereas the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong groundshaking, liquefaction, and seismically-induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: the state is charged with identifying and mapping areas at risk of strong groundshaking, liquefaction, landslides, and other corollary hazards, and cities and counties are required to regulate development within mapped Seismic Hazard Zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within Seismic Hazard Zones until appropriate site-specific geologic or geotechnical investigations have been carried out, and measures to reduce potential damage have been incorporated into the development plans.

California Building Standards Code

The State of California's minimum standards for structural design and construction are provided in the California Building Standards Code (CBSC) (California Code of Regulations, Title 24). The CBSC is based on the Uniform Building Code (UBC) (International Conference of Building Officials 1997), which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed and/or more stringent regulations.

The CBSC requires that "classification of the soil at each building site…be determined when required by the building official" and that "the classification … be based on observation and any necessary test of the materials disclosed by borings or excavations." In addition, the CBSC states that, "the soil classification and design-bearing capacity shall be shown on the (building) plans, unless the foundation conforms to specified requirements." The CBSC provides standards for various aspects of construction, including (i.e., not limited to) earthquake forces to be expected in various zones of the state, construction on expansive soils, foundation investigations, and liquefaction potential and soil strength loss. In accordance with California law, project design and construction would be required to comply with provisions of the CBSC.

2.2.3.1.3 Local

Solano County Grading and Erosion Control

The purpose of the Solano County Code (SCC) covering Grading and Erosion Control (Section 10-45) is to establish minimum standards and provide regulations for grading, construction, and erosion and sediment control. A grading permit is required for construction-related projects in the County. As part of the permit, the project applicant must submit a grading and erosion control plan, vicinity and site maps, and other supplemental information. Standard conditions in the grading permit include a description of BMPs, similar to those contained in a SWPPP.

City of Fairfield General Plan

The following relevant objectives and policies from the City of Fairfield General Plan address geologic and seismic hazards.

- Objective HS 1. Minimize exposure of the community to hazards associated with seismic activity.
  - Policy HS 1.1. Existing buildings, structures, and walls within the City shall meet the minimum seismic safety standards.
  - Policy HS 1.2. All new buildings, structures, and walls shall conform to the latest seismic and geologic safety structural standards of the California Building Code as a minimum standard.
  - Policy HS 1.3. Comply with the requirements of State law and the recommendations of a certified geotechnical consultant when determining setbacks from an active fault trace for new development.
  - Policy HS 1.4. Require detailed geologic studies by a Registered Geologist (RG), Certified Engineering Geologist (CEG), and/or Geotechnical Engineer for projects within the areas of potential seismic activity. All studies prepared shall identify the location of

all surface fault traces within 100 feet of any proposed structure and determine their relative activity. Adequate provisions for mitigation of potential hazards to human life or property shall also be included.

- Policy HS 1.8. Any existing facility that is located within the boundary of a Special Study Zone and that attracts large numbers of people, is open to the public, or provides essential community services, shall be investigated by a structural engineer for potential hazards to life and the property due to fault displacement. Cost of such services shall be borne by the building owner. If hazards are identified, appropriate hazard mitigation actions, subject to City approval shall be implemented.

- Objective HS 2. Minimize exposure of the community to geologic hazards associated with landslides and ground failure.
  - Policy HS 2.8. Require an erosion control and rehabilitation plan to be prepared for projects requiring substantial groundbreaking activities to control short-term and long-term erosion and sedimentation in nearby streams and rivers.

2.2.3.2 Existing Conditions

The general terrain or topography in the vicinity of the proposed project consists of surrounding hills (on the north and east sides) with the majority of project area traversing the gentle undulating floor of Green and Suisun Valleys. I-80 generally drops in elevation from approximate Elev. +50m near Red Top Road Undercrossing at the eastern termini of the proposed project to approximate Elev. +30m at the western termini near Air Base Parkway. Between Red Top Road to Air Base Parkway, I-80 crosses Green Valley, Dan Wilson, Suisun, and Ledgewood Creeks.

2.2.3.2.1 Regional Geology

The proposed project lies at the southwest portion of Solano County. The regional geologic structure of this area is similar to other portions of the Northern California Coast Ranges, which consist of a complex series of northwest-trending synclines (trough of stratified rocks) and anticlines (arch of stratified rocks) with a number of northwest-trending faults. The Northern California Coast Range extends across Solano County from the marshlands on the east, to the foothills on the west. There are two primary drainage patterns in Solano County—the drainages in the western third, which includes the project area, drain south to San Francisco Bay through Suisun Bay; and the eastern two-thirds of Solano County drain east and southeast to the Sacramento River.

2.2.3.2.2 Local Geology

General geological features within the project area include alluvial deposits (Qhf) (Holocene), alluvial fan deposits (Qpf) (late Pleistocene) and natural levee deposits (Qhl) (Holocene). A project vicinity geologic map is shown Figure 2-3. Descriptions of the main geologic units (deposits) are as follows:

Qhf—Alluvial fan deposits (Holocene): Moderately to poorly sorted and moderately to poorly bedded sand, gravel, silt, and clay deposited where streams emanate from upland regions onto more gently sloping valley floors or plains. Holocene alluvial fan deposits are

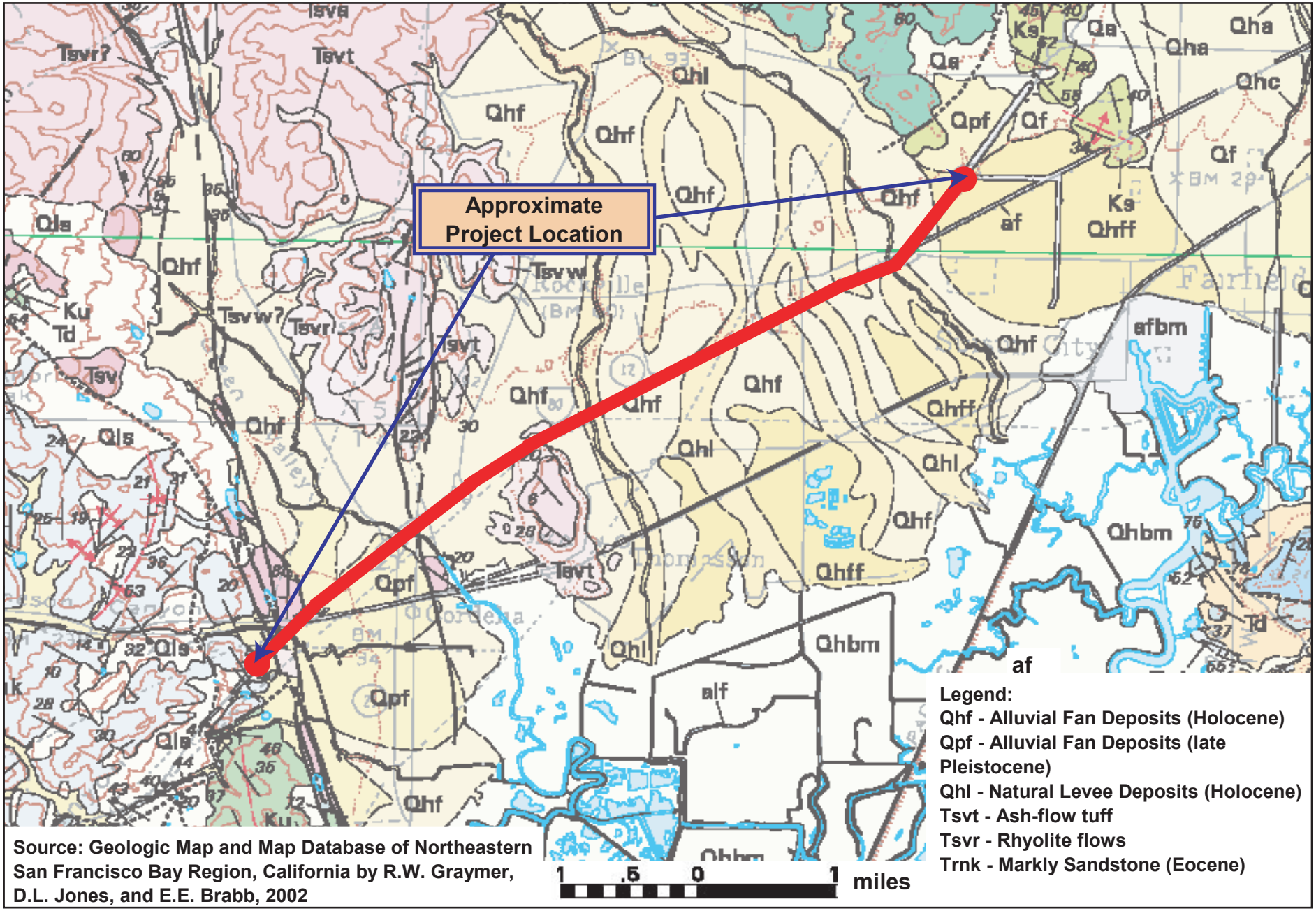


Figure 2-3
Geologic Map

mostly "undissected" by later erosion. In places, Holocene deposits may only form a thin layer over Pleistocene and older deposits.

Qhl—Natural levee deposits (Holocene): Moderately to well sorted sand with some silt and clay deposits by streams that overtop their banks during flooding.

Qpf—Alluvial fan deposits (late Pleistocene): Poorly sorted, moderately to poorly bedded sans, gravel, silt, and clay deposited in gently sloping alluvial fans. These deposits are about 10% denser and have 50% greater penetration resistance than unit Qhl.

Subsurface Conditions

Based on the as-built Log of Test Borings (LOTB) (dated 1950, 1960, 1970) of the Green Valley Creek, Dan Wilson Creek, Ledgewood Creek bridges, and the West Texas Street Undercrossing, the subsurface soil conditions within the project area generally consist of medium stiff to very stiff silty/sandy clay with occasional pockets/lenses/layers of loose to dense sand or silty sand. Based on the LOTBs, groundwater ranges in elevation from approximately –1.0m (-3.3 feet) to +6.1m (+20 feet).

Seismic Conditions

The project is located in a seismically active part of northern California. Faults in this area are capable of producing earthquakes, and may cause strong ground shaking in the project area. Figure 2-4 presents the locations of the fault systems relative to the project area.

Based on the study Summary of Earthquake Probabilities in the San Francisco Bay Region: 2003–2032 by "Working Group on California Earthquake Probabilities," (USGS 2003)the Green Valley Fault (GVY), which is part of the Concord—Green Valley Fault, has a 4% probability of one or more major (magnitude greater than 6.7) earthquakes during the coming 30 years. According to the same study, there is a 62% probability of at least one magnitude 6.7 or greater earthquake within the San Francisco Bay region before 2032.

Maximum credible earthquake magnitudes for some of the major faults in the project region are summarized in the Table 2-1 below. These maximum credible earthquake magnitudes represent the largest earthquakes that could occur on the given fault based on the current understanding of the regional tectonic structure.

Based on this and other calculations, the controlling fault is the Cordelia Fault (magnitude 6.5). This site-specific seismic information would be used in designing the proposed project structures.

Table 2-1: Faults That Have the Potential to Cause Ground Shaking in the Project Area

Fault	Distance to Fault from Center of Project Area (km)	Maximum Credible Earthquake (Magnitude)
Cordelia (Style: strike –slip)	1.4	6.5
Green Valley (Style: strike –slip)	3.3	6.75
Vaca – Kirby Hill – Montezume Hills/E (Style: Not known/published)	11.7	6.75

Seismic Hazards/Liquefaction Potential

Potential seismic hazards may arise from three sources—ground shaking, surface fault rupture, and liquefaction. Based on the review of available geological and seismic data, the possibility of the project area to experience strong ground shaking may be considered moderate to high. It should be noted that the Green Valley Fault and Cordelia Fault pass under I-80 generally in the area of Route 12 West/Jameson Canyon Road to the west and Green Valley Creek to the east. Therefore, the potential for ground surface rupture due to faulting within this localized area is considered relatively high. However, since no other active fault passes through the immediate project area, the potential for fault rupture within the section project area is considered relatively low.

Liquefaction is a phenomenon in which saturated cohesionless soils are subject to a temporary but essentially total loss of shear strength associated with earthquake shaking. Submerged cohesionless sands and silts of low relative density are the type of soils that usually are susceptible to liquefaction. Clays are generally not susceptible to liquefaction. The project area is generally underlain by stiff to very stiff clay with occasional pockets, lenses, and layers of loose dense sands, and thus the liquefaction potential within the project area is generally low to moderate.

The potential effects resulting from post-liquefaction settlement on the roadway should be relatively small because the potentially liquefiable soil layers are generally covered by cohesive soils, which tend to serve as a "soil mat" and should reduce the potential impact of liquefaction.

2.2.3.3 Impacts

Based on the preliminary design of the proposed project, the potential to expose people or structures to substantial adverse effects including the risk of loss, injury, or death is considered low or less than significant taking into account design mitigation measures described in section 2.2.3.4. Most construction activities would occur in the median of the roadway, and follow-up design efforts are planned during subsequent phases of project development. In addition, construction of the project elements that would result in substantial soil erosion is not anticipated, nor is there an expected loss of topsoil, because the proposed HOV lanes would be constructed within the I-80 right-of-way on relatively flat terrain. Widening the four bridges is not expected to result in the loss of topsoil and result in increased erosion. Finally, the project would not be located on expansive soil, and thereby would not create a substantial risk to life or property.

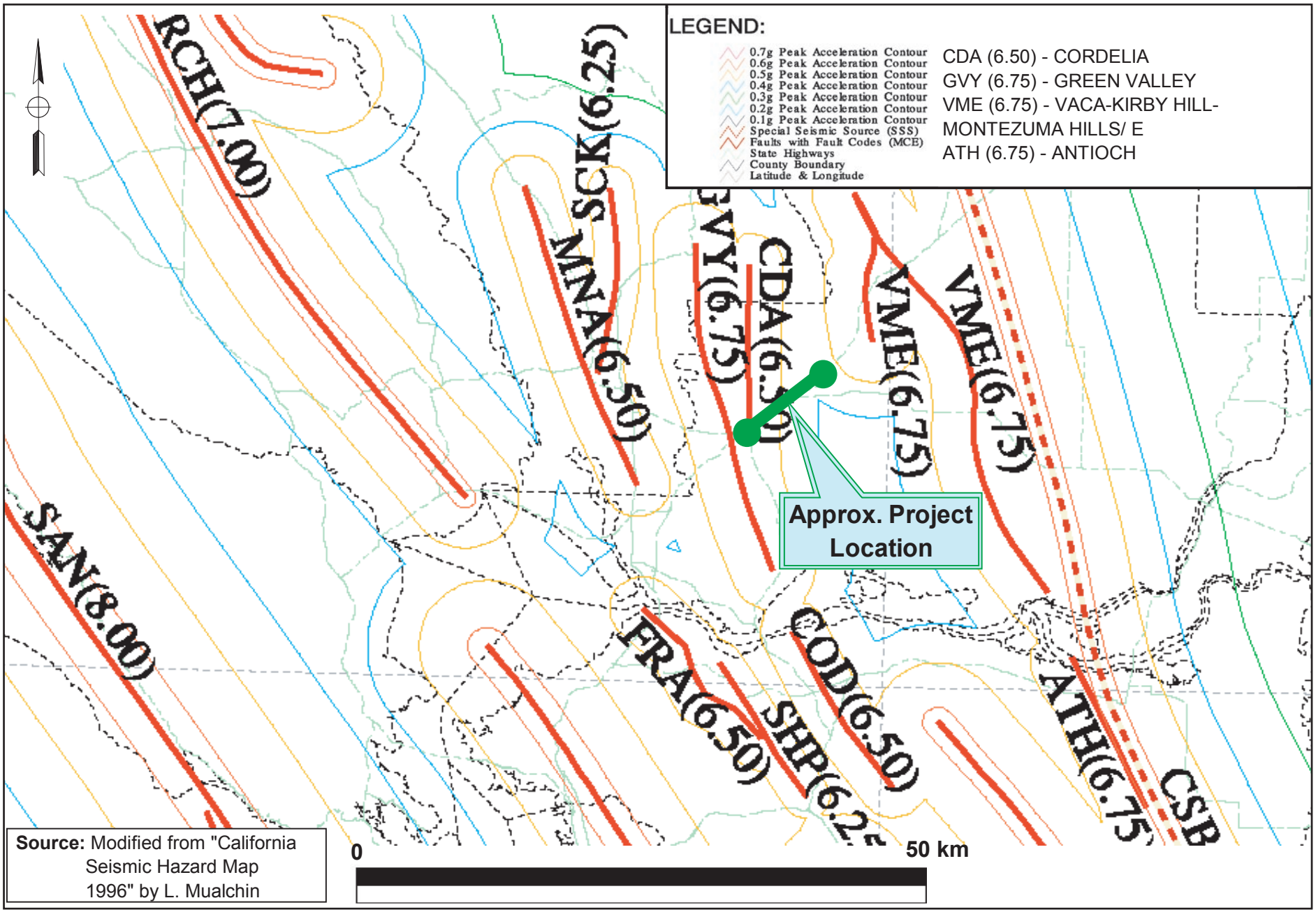


Figure 2-4
Fault Map

The proposed project would not be located on a geological unit or soil that is unstable, or that would become unstable as a result of the project. The Green Valley Fault and Cordelia Fault pass through I-80 in the area of Route 12 West/Jameson Canyon Road to the west and Green Valley Creek to the east. There, the potential for ground surface rupture due to faulting within this section of the project is considered relatively high.

The potential for the project area to experience liquefaction or post-liquefaction settlement is considered low to moderate. Therefore, the potential adverse effect is considered less than significant but would be evaluated further during subsequent design phases of the project.

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

Evaluation of impacts was based on the results of the preliminary geotechnical report prepared for the project and on professional judgment. The analysis of potential impacts assumes project structural elements would conform to the UBC building standards, Solano County grading ordinances, and NPDES requirements. The project applicant would comply with Caltrans design and construction methods thereby accommodating the geotechnical and geological conditions within the project area. Below is a brief description of proposed design elements that would reduce potential impacts to less than significant.

Displacement of the Green Valley Fault and the Cordelia Fault could result in surface rupture or faulting within the area Route 12 West/Jameson Canyon Road. Structures not built according to seismic safety standards are more susceptible to damage and subsequent increased risk of injury to humans, than structures built in accordance with the UBC. Because all structures would conform to the latest Caltrans and UBC standards, which establish requirements for seismic safety of all structures, and the bridge-widening activities would not change conditions with respect to the present surface rupture or faulting hazards, no mitigation measures are proposed.

A large earthquake could cause moderate to strong ground shaking in the project area from nearby faults. Should this occur, the potential impact is not considered adverse even though the anticipated ground acceleration within the area could be between 0.6g and 0.72g. Assuming the design of project structures would conform to Caltrans and UBC standards, the anticipate impact would not be great enough to cause structural damage or injury. Further design reviews would determine whether any mitigation measures would be warranted.

Proposed measures in part to protect water quality and prevent erosion to and in drainages during construction are described in section 2.3.2.3, Drainages, specifically subsection 2.3.2.3.3.

2.2.4 Hazardous Waste/Materials

2.2.4.1 Regulatory Setting

2.2.4.1.1 Asbestos Regulations

Title 8, CCR Section 1529 regulates asbestos exposure in all construction work and defines permissible exposure limits and work practices. Typically removal or disturbance of more than 100 square feet of material containing more than 0.1 percent asbestos must be performed by a registered asbestos abatement contractor, but associated waste labeling is not required if the

material contains 1 percent or less asbestos. When the asbestos content of materials exceeds 1 percent, virtually all requirements of the standard become effective. With respect to potential worker exposure, notification, and registration requirements, Cal/OSHA defines asbestos-containing construction material (ACCM) as construction material that contains more than 0.1 percent asbestos (Title 8, CCR 341.6).

2.2.4.1.2 Solano County Hazardous Waste Management Plan

Pursuant to state law, Solano County has prepared a County Hazardous Waste Management Plan (CHWMP), which was adopted on August 31, 1989. The CHWMP provides for environmentally sound management of all hazardous waste projected to be generated in Solano County through 2000. The California Department of Health Services, the agency responsible for administering and overseeing the hazardous waste management process, has approved Solano County's plan.

The CHWMP was prepared for the purpose of complying with federal and state laws that mandate the management of hazardous wastes; assistance in expediting the land-use permitting process for new treatment, storage, and disposal facilities; and assistance in identifying California's hazardous waste management needs. Data from the CHWMP will be incorporated into the State Hazardous Waste Management Plan.

2.2.4.2 Existing Conditions

Geocon Consultants, Inc. prepared an initial site assessment for hazardous materials for the project area, dated June 2006 (STA 2006d). Based on the results of the assessment, it was determined that hazardous waste is likely present within and adjacent to the areas proposed for roadway improvements.

Five properties within 0.25-mile of the project area with known or potential releases of petroleum hydrocarbons or volatile organic compounds (VOCs) have been identified. Three businesses were listed in the leaking underground storage tank (LUST) database. Two dry cleaning businesses are located in the vicinity. Dry cleaners as a category represent a concern for subsurface impacts from handling, spills, and waste management of VOCs associated with dry cleaning fluids. These products may be present in shallow soils and shallow groundwater.

Aerially deposited lead (ADL) may be present in the surface and near-surface soils due to past emissions from vehicles powered by leaded gasoline.

All three creeks drain into Suisun Slough, a 303d listed water body impacted by Diazinon. Ledgewood Creek is also a 303d listed water body impacted by Diazinon coming from urban runoff and storm sewers.

Four bridges are located in the project area. Asbestos has been identified in components of Caltrans bridges, such as expansion joints and guardrail shims used on metal rail assemblies. Geocon Consultants Inc., conducted a limited asbestos survey (STA 2006e) which indicated that asbestos was present at the bridge over West Texas Street. Chrysotile asbestos at concentrations of 50 and 60 percent was detected in samples representing nonfriable sheet packing used as barrier rail shims, and asbestos at concentrations of less than 0.25 percent was detected in a sample representing nonfriable thread compound used on the barrier rail posts. In both cases, Geocon was unable to quantify the samples due to safety concerns (traffic). No barrier rail

shims were observed on the bridges over Green Valley and Ledgewood Creeks, however, a complete inspection was not feasible due to safety concerns (traffic). Metal rail assemblies were not observed on the Suisun Creek Bridge. Additionally, lead may be present in paint applied to bridge surfaces.

Wildland fires are a seasonal hazard in northern California and represent more than half the fires occurring in the unincorporated areas. According to the California Department of Forestry and Fire Protection, Solano County Natural Hazard Disclosure (Fire) Map (2000), the project area is not located in a region identified as a "wildland area that may contain substantial forest fire risks and hazards, or very high fire hazard severity zone."

2.2.4.3 Impacts

It is likely that pesticides used on local farms are routinely transported along this segment of I-80. Once operational, the proposed project and alternatives would not result in any increase in the routine transport, use, or disposal of pesticides, nor would construction of the project necessitate a temporary road or detour. The project would improve traffic safety along the project corridor, thereby reducing the risk to the public of accidental exposure to hazardous materials. There would be *no impact* associated with the transport of hazardous materials.

Ledgewood Creek and Suisun Slough (into which the creeks all drain) are 303d listed water bodies impacted by Diazinon. Groundwater in the area ranges between 3 and 6 feet below the surface. Construction work associated with the bridge widening will likely result in excavations that are impacted by shallow groundwater. These factors may result in exposure of workers and the public to hazardous materials. The implementation of Mitigation Measure WQ-1 will reduce this impact to a less-than-significant level.

Project construction would occur in areas where shallow soil may have been impacted by ADL and in the bridge construction areas where soil and shallow ground water may have been impacted by VOCs and petroleum hydrocarbons form nearby businesses with known or potential subsurface releases. Therefore, construction workers may be exposed to these hazardous materials. Implementation of Mitigation Measure WQ-1 and HAZ-1 would reduce this impact to a *less-than-significant* level.

Project construction would entail renovation and construction work on one bridge that has components that contain asbestos and two other bridges that may have components that contain asbestos. Construction workers may be exposed to asbestos while working on these bridges. Asbestos exposure is associated with serious respiratory health concerns. This would be a significant impact. Implementation of Mitigation Measures HAZ-2, HAZ-3, HAZ-4 and HAZ-5 would reduce this impact to a *less-than-significant* level.

During construction, hazardous materials such as asphalt, solvents, and equipment oils and lubricants would be present onsite and could spill during construction and under post-construction conditions. In the event of a spill, notification and cleanup operations would be undertaken in full compliance with the County or City emergency response plan to mitigate hazards to people and the environment. Consequently, this impact is considered *less than significant*.

Three public schools are located within 0.25-mile of the project area. One middle school is located within a 0.25-mile radius of the Green Valley Creek crossing. The project includes construction on the Green Valley Creek bridge. No barrier rail shims, which may contain asbestos, were noted on the Green Valley Creek bridge. Mitigation Measures HAZ-3, HAZ-4, and HAZ-5 would be in place to mitigate the potential presence of asbestos during construction. Hazardous materials would be used and could spill during construction and under post-construction conditions. In the event of a spill, notification and cleanup operations would be performed in compliance with the County or City emergency response plan to mitigate hazards to people and the environment. Consequently, this impact is considered *less than significant*.

The initial site assessment did not find direct indication of the presence of hazardous materials or waste within the project area. However, a review of databases indicates that some properties adjacent to the project area are referenced as using, generating, storing, or disposing of hazardous materials; and that unauthorized releases of petroleum products or hazardous materials have been reported adjacent to and within the study area. Construction activities could potentially disturb contaminated soils. Workers and residents could be exposed to hazardous wastes or materials in the soils that are excavated, disturbed, or exposed by construction of the proposed improvements. Exposure of workers or residents to hazardous wastes or materials in the soil is considered significant because of the possible threat to human health. Implementation of Mitigation Measure HAZ-6 would reduce this impact to a *less-than significant* level.

The nearest airport to the project area is at Travis Air Force Base, which is located more than four miles east of the project area. The project would not result in a safety hazard for people residing or working in the project vicinity. There would be *no impact*.

Construction traffic, lane closures, or unforeseen delays could impede emergency response vehicles during construction of the proposed project. This impact is potentially significant. Implementation of Mitigation Measure UTL-1 would reduce this impact to a *less-than-significant* level.

According to the California Department of Forestry and Fire Protection, Solano County Natural Hazard Disclosure (Fire) Map, the project corridor is not located in an area identified as a wildland area that may contain substantial forest fire risks and hazards, or very high fire hazard severity zone. This impact is considered *less than significant.*

2.2.4.4 Avoidance, Minimization, and/or Mitigation Measures

Mitigation Measure HAZ-1: Dispose of ADL-Contaminated Soils in Accordance with Appropriate Regulations

A preliminary investigation and screening for ADL will be performed along the planned alignment to determine the levels of lead in the surface and near-surface soils. Because the ADL-contaminated soil has the potential to be characterized as a hazardous waste, all aspects of the removal, storage, transportation, and disposal shall be conducted in strict accordance with the appropriate regulations. The contractor shall prepare a health and safety plan to address worker safety when working with potentially lead-bearing soils during construction.

Mitigation Measure HAZ-2: Prepare and Implement Water and Soil Sampling, Testing, and Treatment Plan
The potential for the presence of ADL from automobile emissions in soil, the potential for VOC and petroleum hydrocarbons in the groundwater from surrounding businesses, and the potential for asbestos and lead in bridge components necessitate a sampling, testing, and treatment plan. The plan shall include methods of sampling and testing to be implemented, and provide treatment measures should hazardous materials be located. The plan shall be completed and testing and sampling implemented prior to commencement of construction.

Mitigation Measure HAZ-3: Asbestos Removal by Certified Asbestos Abatement Contractor
The asbestos-containing barrier rail shims (a Category I nonfriable/nonhazardous material) and nonfriable/nonhazardous thread compound will be removed and disposed of by a licensed and certified asbestos abatement contractor prior to renovation, demolition, or other activities that would disturb the material.

Mitigation Measure HAZ-4: Notification of Contractors of Presence of Asbestos
Contractors that will be conducting the renovation, demolition, or related activities will be notified of the presence of asbestos prior to work. The contractors will be provided with a copy of the Asbestos Survey Report and a list of asbestos removed by the asbestos abatement contractor during abatement activities. The contractors will be instructed not to disturb asbestos during their work. Contractors will be responsible for informing the landfill of the contractor's intent to dispose of asbestos waste and segregating and characterizing waste streams prior to disposal.

Mitigation Measure HAZ-5: Notify Air Pollution Control Office (APCO) of Asbestos-Related Work
In accordance with Bay Area Air Quality Management District (BAAQMD) Regulation 11, Rule 2, written notification will be provided to the APCO of the BAAQMD ten (10) working days prior to commencement of any demolition activity (whether asbestos is present or not) and for renovation activities involving specified quantities of regulated asbestos-containing material (RACM).

Mitigation Measure HAZ-6: Comply with All Applicable Hazardous Waste Management Regulations
The construction contractor shall comply with all federal, state, and local regulations regarding hazardous waste management.

2.2.5 Air Quality

2.2.5.1 Regulatory Setting
The proposed project is located in the Solano County, which is subject to the requirements of Bay Air Quality Management District (BAAQMD). The BAAQMD has jurisdiction over air quality issues in southwestern Solano County, in addition to the counties surrounding San Francisco Bay. It administers air quality regulations developed at the federal, state, and local

levels. State and local air quality regulations applicable to the proposed project are described below.

2.2.5.1.1 State Requirements

The California Air Resources Board (ARB) and local air pollution control districts are responsible for achieving California's ambient air quality standards (CAAQS) (Table 2-2), which are more stringent than federal standards for certain pollutants and averaging periods. State standards are to be achieved through district-level air quality management plans that are incorporated into the State Implementation Plan (SIP). In California, the EPA has delegated authority to ARB to prepare SIPs, which, in turn, has delegated that authority to individual air districts.

The ARB has traditionally established state air quality standards, maintained oversight authority in air quality planning, developed programs for reducing emissions from motor vehicles, developed air emission inventories, collected air quality and meteorological data, and approved state implementation plans.

Responsibilities of air districts include overseeing stationary source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality related sections of environmental documents required by CEQA.

The California Clean Air Act (CCAA) of 1988 substantially added to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures.

The CCAA focuses on attainment of the state ambient air quality standards and requires designation of attainment and nonattainment areas with respect to these standards. The act also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan (Clean Air Plan) if the district violates state air quality standards for CO, SO_2, NO_2, or ozone. These plans are specifically designed to attain state standards and must be designed to achieve an annual 5% reduction in district-wide emissions of each nonattainment pollutant or its precursors. No locally prepared attainment plans are required for areas that violate the state PM10 standards; the ARB is responsible for developing plans and projects that achieve compliance with the state PM10 standards.

The CCAA requires that the state air quality standards be met as expeditiously as practicable, but, unlike the federal Clean Air Act (CAA), does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards.

The CCAA emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The act gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCM). The CCAA does not define the terms *indirect [sources]* and *area-wide sources*. However, Section 110 of the federal CAA defines an indirect source as

Table 2-2. Ambient Air Quality Standards Applicable in California and the Attainment Status of Solano County

Pollutant	Symbol	Average Time	Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria		Attainment Status of Solano County[a]	
			California	National	California	National	California	National	California	National
Ozone	O_3	1 hour	0.09	NS	180	NS	If exceeded	If exceeded on more than 3 days in 3 years	Serous nonattainment	NS
		8 hours	0.070	0.08	137	157	If exceeded	If fourth highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor within an area	Not yet classified.	Marginal nonattainment
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year	Attainment	Marginal maintenance[b]
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year	Attainment	Unclassified/ attainment
(Lake Tahoe only)		8 hours	6	NS	7,000	NS	If equaled or exceeded	NS	NS	NS
Nitrogen dioxide	NO_2	Annual average	NS	0.053	NS	100	NS	If exceeded	NS	Attainment
		1 hour	0.25	NS	470	NS	If exceeded	If exceeded	Attainment	NS
Sulfur dioxide	SO_2	Annual average	NS	0.030	NS	80	NS	If exceeded	NS	Attainment
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year	Attainment	Attainment
		1 hour	0.25	NS	655	NS	NS	NS	Attainment	NS
Hydrogen sulfide	H_2S	1 hour	0.03	NS	42	NS	If equaled or exceeded	NS	Unclassified	NS
Vinyl chloride	C_2H_3Cl	24 hours	0.010	NS	26	NS	If equaled or exceeded	NS	No designation	NS
Inhalable particulate matter	PM10	Annual geometric mean	NS	NS	20	NS	If exceeded	NS	Nonattainment	NS
		Annual arithmetic mean	NS	NS	NS	50	NS	If exceeded	NS	Unclassified/ attainment
		24 hours	NS	NS	50	150	If exceeded	If average 1% over 3 years is exceeded	Nonattainment	Unclassified/ attainment
	PM2.5	Annual geometric mean	NS	NS	12	NS	If exceeded	NS	Nonattainment	NS
		Annual arithmetic mean	NS	NS	NS	15	NS	If exceeded	NS	Unclassified/ attainment
		24 hours	NS	NS	NS	65	NS	If average 2% over 3 years is exceeded	NS	Unclassified/ attainment
Sulfate particles	SO_4	24 hours	NS	NS	25	NS	If equaled or exceeded	NS	Attainment	NS
Lead particles	Pb	Calendar quarter	NS	NS	NS	1.5	NS	If exceeded no more than 1 day per year	NS	No designation
		30 days	NS	NS	1.5	NS	If equaled or exceeded	NS	Attainment	NS

Source: California Air Resources Board 2003

Notes: All standards are based on measurements at 25ºC and 1 atmosphere pressure; National standards shown are the primary (health effects) standards.

[a] the portion of Solano County within the San Francisco Bay Area Air Basin.

[b] Urbanized areas described in the Technical Support Document from 3/29/85, 50 CFR 12540.

The designation NS (No Standards) represents averaging periods that do not have both state and federal standards.

> "a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution. Such term includes parking lots, parking garages, and other facilities subject to any measure for management of parking supply…"

TCMs are defined in the CCAA as "any strategy to reduce trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing vehicle emissions."

2.2.5.1.2 Local and Regional Implementation of Federal Requirements

The air quality management agencies of direct importance to western Solano County include the EPA, ARB, and the BAAQMD. The EPA has established federal ambient air quality standards for which the ARB and the BAAQMD have primary implementation responsibility. The ARB and the BAAQMD are also responsible for ensuring that State ambient air quality standards are met.

Local Standards

Guidance for the determination of significant air impacts under CEQA within western Solano County is found in the BAAQMD document, *BAAQMD CEQA Guidelines: Assessing Air Quality Impacts of Projects and Plans*.

BAAQMD does not require quantification of construction emissions. Instead, it requires implementation of effective and comprehensive feasible control measures to reduce PM10 emissions (Bay Area Air Quality Management District 1996, revised 1999). PM10 emitted during construction activities varies greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, and weather conditions. Despite this variability in emissions, experience has shown there are a number of feasible control measures that can be reasonably implemented to reduce PM10 emissions during construction; these measures are summarized in Table 2-2. According to the BAAQMD, if all control measures listed in Table 2-3 are implemented (as appropriate, depending on the size of the project area), air pollutant emissions from construction activities would be considered less than significant (Bay Area Air Quality Management District 1996, revised 1999). Construction equipment also emits CO and ozone precursors. Construction-related emissions of these pollutants were not estimated, however, because they are already included in the emission inventory that forms the basis for the BAAQMD's regional air quality plans and because those emissions are not expected to impede attainment or maintenance of ozone and CO standards in the Bay Area (Bay Area Air Quality Management District 1996, revised 1999).

Table 2-3. BAAQMD Feasible Control Measures for Construction Emissions of PM10

Basic Control Measures. The following controls should be implemented at all construction sites.
▪ Water all active construction areas at least twice daily. ▪ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 0.6 meters (2 feet) of freeboard. ▪ Pave, apply water three times daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. ▪ Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites. ▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
Enhanced Control Measures. The following measures should be implemented at construction sites greater than 4 acres in area.
▪ Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (i.e., previously graded areas inactive for 10 days or more). ▪ Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles (e.g., dirt and sand). ▪ Limit traffic speeds on unpaved roads to 24.1 kilometers per hour (15 miles per hour). ▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways. ▪ Replant vegetation in disturbed areas as quickly as possible.
Optional Control Measures. The following control measures are strongly encouraged at construction sites that are large in area, located near sensitive receptors, or for any other reason may warrant additional emissions reductions, but the project applicant is not required to implement.
▪ Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site. ▪ Install windbreaks or plant trees or vegetative wind breaks at windward side(s) of construction areas. ▪ Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. ▪ Limit the area subject to excavation, grading, and other construction activity at any one time.

Source: Bay Area Air Quality Management District 1996, revised 1999.

For project operations, the BAAQMD identifies a significant air quality impact as being a:

- net increase in pollutant emissions of 80 pounds per day (ppd) or 15 tons per year (tpy) of ROG, NO_x, or PM10; or
- project-related contribution to CO concentrations exceeding the CAAQS for the 1- and 8-hour standards (described below). Projects that do not result in the following are presumed to result in less-than-significant levels of CO emissions, and no estimation of CO concentrations is necessary (Bay Area Air Quality Management District 1996, revised 1999).
  - vehicle emissions of CO exceeding 550 ppd
  - project traffic impacting intersections or roadway links operating at LOS D, E or F
  - project traffic causing intersection or roadway link LOS to decline to D, E or F; or

- project traffic increasing traffic volumes on nearby roadways by 10% or more (unless the increase in traffic volume is less than 100 vehicles per hour).

2.2.5.2 Existing Conditions

The project lies within Carquinez Straight Region of the San Francisco Bay Area Air Basin (SFBAAB).

The existing air quality conditions in the project area can be characterized by monitoring data collected in the region. The closest air quality monitoring station is located in Fairfield at Chadbourne Road; this station monitors for ozone. The closest monitoring station that monitors for carbon monoxide and particulate matter is located in Vallejo at Tuolumne Street. Information from these monitoring stations during the last three years in which complete data is available (2003–2005) was examined (Jones & Stokes 2006c). The Fairfield monitoring station has experienced one violation of the state ozone standard during the 3-year monitoring period, while the Vallejo station has experienced two violations of the state ozone standard and 6.1 violations of the state PM10 standards over the same period. No other violations occurred at these monitoring stations during this time period.

Areas are classified as either *attainment* or *nonattainment* with respect to state and federal ambient air quality standards by comparing actual monitored air pollutant concentrations to state and federal standards. If a pollutant concentration is lower than or meets the state or federal standard over a designated period of time, the area is classified as being in attainment of the standard for that pollutant. If a pollutant violates the standard, the area is considered a nonattainment area for that pollutant. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated unclassified. This typically occurs in nonurbanized areas where levels of the pollutant are not a concern.

The EPA has classified the portion of Solano County within the SFBAAB as being a marginal nonattainment area for the 8-hour ozone standard. For the CO standard, the EPA has classified the county as a moderate (≤ 12.7 ppm) maintenance area for urbanized areas described in the Technical Support Document from 3/29/85, 50 CFR 12540; the rest of the County is classified as an unclassified/attainment area. For the PM10 and PM2.5 standards, the EPA has classified the County as an unclassified/attainment area. The ARB has classified the County as being a serious nonattainment area for ozone. For the CO standard, the ARB has classified the County as being an attainment area. For the PM10 and PM2.5 standards, the ARB has classified the County as a nonattainment area. Solano County's attainment status for each of these pollutants relative to the NAAQS and CAAQS is summarized in Table 2-2.

2.2.5.2.1 Climate and Topography

The Carquinez Straight is the only sea-level gap between the San Francisco Bay and the Central Valley. Within the region, the prevailing winds are from the west, but during the summer and fall months, marine air flows eastward through the Carquinez Strait due to high pressure offshore and low pressure in the Central Valley. These easterly winds usually contain more pollutants than the cleaner marine air from the west. During summer and fall months, this can result in elevated pollutant levels as pollutants move through the strait into the central Bay Area from surrounding areas. The high pressure periods during the summer and fall months are often accompanied by low wind speeds, shallow mixing depths, higher temperatures and little or no

rainfall. During the summer, mean maximum temperatures reach about 32.2º C (90º F), while mean minimum temperatures in the winter are typically 1.6–4.4º C (35–40º F). In distant areas like Fairfield, where the region is sheltered from the moderating effects of the strait, temperature extremes are especially pronounced.

There are many industrial facilities, such as chemical plants and refineries, located within the Carquinez Strait Region that generate significant air pollutant emissions. However, the high wind speeds in the region often help moderate the pollution potential of this area. Occasionally, short-term pollution episodes can result from upsets at industrial facilities, while unpleasant odors may occur at anytime. The result is that receptors downwind of these facilities could suffer more long-term exposure to air contaminants than individuals elsewhere. Areas of the region that are traversed by major roadways, such as I-80, may also be subject to higher local concentrations of carbon monoxide and particulate matter, as well as certain toxic air contaminants such as benzene.

2.2.5.2.2 Sensitive Receptors

Certain residents, such as the very young, the elderly, and those suffering from certain illnesses or disabilities, are particularly sensitive to air pollution and are considered "sensitive receptors." Examples of land uses where significant numbers of sensitive air quality receptors are often found are schools, day care centers, parks, recreational areas, medical facilities, and rest homes and convalescent care facilities. Land use conflicts can arise when sensitive receptors are located next to major sources of air pollutant emissions. Sensitive air quality receptors in the immediate vicinity of the proposed project include:

- Scattered residences and residential developments along I-80
- Two motels
- Sikh temple

2.2.5.3 Impacts

A project is deemed inconsistent with air quality plans if it would result in population or employment growth that exceeds growth estimates included in the applicable air quality plan. Therefore, proposed projects need to be evaluated to determine whether they would generate population and employment growth and, if so, whether that growth would exceed the growth rates included in the relevant air plans.

The proposed project is included in the adopted RTP, *Transportation 2030 Plan* and adopted TIP, *2005 Transportation Improvement Program*. The proposed project is identified in Appendix 1 from the RTP as RTP ID: 21807, *I-80/I-680/Route 12 interchange improvements (Phase 2)* (Metropolitan Transportation Commission 2005a). *TIP Amendment #05*-05 from MTC's TIP identifies the proposed project as TIP ID: SOL050031, *I-80/I-680 I/C HOV lanes.* The design and scope of the project remains the same as identified in the adopted RTP and TIP.

Air quality modeling conducted by MTC has been conducted showing that emissions associated with the RTP and TIP are within the allowable emission budgets for CO and ozone precursors (Metropolitan Transportation Commission 2005b). Consequently, the proposed project is

considered a conforming transportation project for these regional nonattainment pollutants and this impact is considered *less than significant*.

2.2.5.3.1 Construction Impacts

Implementation of the project would result in the construction of widened roads, overcrossings, and embankments, as well as intersection improvements. In addition, the proposed project would result in the reconfiguration of barriers at the truck scales, and some minor alterations to on- and off-ramps at the truck scales. Temporary construction emissions would result from grubbing/land clearing, grading/excavation, drainage/utilities/subgrade, and paving activities and construction worker commuting patterns. Pollutant emissions would vary daily, depending on the level of activity, specific operations, and prevailing weather. It is anticipated that construction activities would begin in 2007 and continue for approximately 24–36 months.

The Road Construction Emissions Model (Version 5.1) was used to estimate construction-related ozone precursors (ROG and NO_x), CO, and PM10 emissions from construction activities. It was assumed that construction activities would occur for 8 hours per day over a 12-month period. The total project length was assumed to be 8.3 miles, with a total acreage of 36 acres and a maximum of 9 acres disturbed per day. Construction activities were divided into separate phases and analyzed separately. The results of modeling for construction activities are summarized in Table 2-4.

Table 2-4. Construction Emission Estimates in kgs/day (lbs/day)

Construction Phase	ROG	NO_X	CO	PM10
Grubbing/land clearing	12 (27)	53 (117)	58 (127)	24 (53)
Grading/excavation	11 (24)	46 (101)	52 (114)	24 (53)
Drainage/utilities/subgrade	10 (23)	43 (95)	45 (100)	24 (52)
Paving	8 (18)	33 (117)	40 (127)	3 (53)

Note: Emissions calculations based on Road Construction Emissions Model (Version 5.1)

Construction activities are subject to Caltrans requirements found in the Caltrans document, *Standard Specifications: For Construction of Local Streets and Roads* (Caltrans 2002). Standard Specification 7-1.01F stipulates that construction activities must comply with all rules, regulations, ordinances, and statutes of the local air pollution control district, while Standard Specification 10 addresses dust control requirements. In addition, the BAAQMD requires the implementation of all feasible, effective, and comprehensive control measures to reduce PM10 emissions from construction activities. These control measures are summarized in Table 2-3. Implementation of Mitigation Measures AQ-1 and AQ-2 would minimize air quality impacts from construction activities.

2.2.5.3.2 Operational Impacts

Long-term air quality impacts are those associated motor vehicles operating on the roadway network, predominantly those operating in the project vicinity. Emission of ROG, NO_x, CO, and PM10 for base year (2004, interim year (2015) with and without project, and buildout year (2030) with and without project conditions were evaluated through modeling conducted using the ARB's EMFAC2002 (version 2.2) emission rate program and traffic data provided by the project traffic engineers, Fehr & Peers (STA 2006b, Rabinovitz pers. comm.). The traffic

conditions modeled in the analysis included vehicle activity for HOV and non-HOV lanes of travel along I-80 within the proposed project boundaries.

The EMFAC2002 model and traffic data provided by Fehr & Peers (STA 2006b, Rabinovitz pers. comm.) were used to estimate project-level, operation-related emissions of ozone precursors (ROG and NO_x), CO, and PM10.

Project-level emissions were obtained by comparing future with project emissions to future no project emissions. Future year emissions modeling was conducted for both design year (2015) and buildout year (2030) scenarios. To help identify which types of roadways were contributing the greatest to project-level emissions, the traffic conditions modeled in the analysis included vehicle activity for HOV and non-HOV lanes of travel along I-80 within the proposed project boundaries, in addition to combined HOV and non-HOV activity. The results of these calculations are summarized in the technical report (STA 2006h) and do not exceed the BAAQMD standards. Therefore, this impact is less than significant.

Because the proposed project, as mitigated, would not create a significant construction-related or operational air quality impact, a cumulatively considerable net increase of any criteria pollutant would not occur. This impact is less than significant with the implementation of Mitigation Measures AQ-1 and AQ-2.

The project is not would not generate substantial pollutant concentrations and therefore, could not result in the exposure of sensitive receptors to pollutant concentrations. The project is not expected to generate objectionable odors affecting a substantial number of people.

2.2.5.4 Avoidance, Minimization, and/or Mitigation Measures

Mitigation Measures AQ-1: Implement California Department of Transportation Standard Specification 7-1.01F and Standard Specification 10.
The project proponent will follow Caltrans Standard Specification 7-1.01F and Standard Specification 10, which address the requirements of the local air pollution control district (BAAQMD) and dust control, respectively.

Mitigation Measures AQ-2: Implement BAAQMD Control Measures for Construction Emissions of PM10.
The project proponent will implement all feasible PM10 control measures required by the BAAQMD, indicated in Table 2-3.

2.2.6 Noise

2.2.6.1 Regulatory Setting

Federal and state regulations, standards, and policies relating to traffic noise are discussed in detail in the Caltrans *Construction Noise and Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects* (Protocol) (Caltrans 1998a). The Protocol establishes Caltrans policy for interpretation of title 23, part 772 of the Code of Federal Regulations (CFR) "Procedures for Abatement of Highway Traffic Noise" (23 CFR 772). It also provides guidance

related to the evaluation of noise impacts under CEQA. The evaluation of impacts under 23 CFR 772 is discussed in the noise study report prepared for this project by Jones & Stokes (STA 2006f). Refer to the noise study report for a detailed discussion of the noise impact and abatement analysis prepared for this project. The focus of this CEQA Initial Study is the evaluation of noise impacts under CEQA. Impacts under 23 CFR 772 are discussed at the end of this section.

2.2.6.1.1 California Environmental Quality Act

The main objectives of CEQA are to disclose to decision-makers and the public the significant environmental effects of proposed activities and to identify ways to avoid or reduce those effects by requiring implementation of feasible alternatives or mitigation measures. Under CEQA, a substantial noise increase may result in a significant adverse environmental effect; if so, the noise increase must be mitigated or identified as a noise impact for which it is likely that only partial (or no) mitigation measures are available. Specific economic, social, environmental, legal, and technological conditions can make mitigation measures for noise infeasible.

2.2.6.1.2 Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects

The Protocol specifies the policies, procedures, and practices to be used by agencies that sponsor new construction or reconstruction projects. The Protocol states that if predicted design year traffic noise levels are expected to result in a substantial increase over existing noise level, there is a potential for the proposed project to cause a significant adverse environmental effect. If a substantial increase in noise is predicted, the significance of the noise impact is determined by considering the context and intensity of the impact. This includes the incremental increase in noise cause by the project (i.e., the design year noise level with the project versus the design year noise level without the project.)

2.2.6.2 Existing Conditions

As discussed above the noise study report documents study methods and discusses potential noise impacts and related abatement measures pursuant to 23 CFR 772 associated with the construction and operation of the improvements to I-80 (STA 2006f). The following is a brief summary of information from that document that is relevant to this CEQA assessment.

2.2.6.2.1 Surrounding Noise-Sensitive Land Uses

Sensitive receptors are land uses such as residences, schools, libraries, hospitals, and other similar uses that are considered to be sensitive to noise. The nearest noise sensitive land uses include single- and multi-family residences, a church, two motel swimming pools and a family recreation area. The project area was grouped into areas labeled Areas A through I for analysis.

2.2.6.2.2 Existing Noise Environment

Primary noise sources in the plan area include traffic, aircraft, and fixed sources.

The existing noise environment in the project area was characterized by conducting short- and long-term noise monitoring. Short-term noise monitoring was conducted on Thursday January 19, 2006, and Wednesday, January 25, 2006, and long-term monitoring was conducted at two positions over five consecutive 24-hour periods, beginning Thursday, January 19, 2006, and ending Wednesday, January 25, 2006. The purpose of long-term measurements was to describe

variations in sound levels throughout the day, rather than absolute sound levels at a specific receptor of concern. The average loudest-hour sound level measured at Suisun Creek on the south side of I-80 (LT-1) was 68.4 dBA L_{eq}1h, during the 7:00 am hour. LT-2 was in the backyard of a single-family residence located on Buckingham Drive, south of I-80 in a densely populated neighborhood. The average loudest-hour sound level measured at LT-2 was 74.5 dBA L_{eq}1h, during the 12:00 pm hour.

Table 2-5 summarizes short-term noise monitoring results.

Table 2-5. Noise Monitoring Locations and Results

Measurement Location	Description	Area	Measured L_{eq}
ST-1	Cordelia Road	H	60.4
ST-2	Buckingham Drive	B	57.5
ST-3	Kent Way	B	53.4
ST-4	Michigan Street	D	63.5
ST-5	Warren Street	D	58.6
ST-6	Hamilton Avenue	F	54.2
ST-7	Carnation Drive	A	67.3
ST-8	Begonia Boulevard	A	57.2
ST-9	Mankas Boulevard	C	68.9
ST-10	Mankas Boulevard	C	63.0
ST-12	Hartford Place	E	57.9
ST-13	Lozano Lane	G	71.1
ST-14	Russell Road	I	69.3

2.2.6.3 Impacts

CEQA requires the significance of noise impacts to be determined for proposed projects. The process of assessing the significance of noise impacts associated with a proposed project starts by establishing thresholds at which significant impacts are considered to occur. Next, noise levels associated with project-related activities are predicted and compared to the significance thresholds. A significant impact is considered to occur when a predicted noise level exceeds a threshold.

Noise from traffic on roadways in the project area has been evaluated under the existing conditions, and the project design year with and without the project.

The FHWA Traffic Noise Model (TNM) was used for calculating future traffic noise levels, using traffic information provided by Fehr & Peers (STA 2006b). Noise levels were calculated at noise-sensitive receiver locations potentially affected by the project and at specific prediction locations that would be directly affected by traffic noise along I-80. Construction noise was evaluated using methods recommended by the U.S. Department of Transportation.

2.2.6.3.1 Operational Impacts

The traffic noise modeling results are summarized in Table 2-6. Table E-1 in Appendix E provides detailed modeling results for each receiver evaluated.

Table 2-6. Noise Modeling Results

Area	Noise Levels, dBA, $L_{eq}(h)$			Increase in noise, Design Year with Project vs. Existing, dB	Substantial Increase in Noise?	Significant Impact under CEQA?
	Existing	Design Year, No Project	Design Year with Project			
A	55 to **67**	57 to **69**	57 to **69**	2 to 3	N	N
B	56 to **72**	57 to **74**	58 to **75**	1 to 3	N	N
C	54 to **70**	56 to **72**	56 to **72**	1 to 3	N	N
D	58 to **71**	60 to **73**	60 to **74**	2 to 3	N	N
E	58 to **66**	59 to **68**	60 to **68**	1 to 3	N	N
F	59 to 63	60 to 64	61 to 64	1 to 2	N	N
G	64 to **72**	**66** to **74**	**66** to **75**	1 to 3	N	N
H	65 to **72**	**66** to **73**	**67** to **75**	2 to 4	N	N
I	58 to **71**	59 to **72**	60 to **74**	2 to 3	N	N
J	65 to **78**	**66** to **79**	**66** to **80**	1 to 2	N	N
Fairfield Linear Park	Refer to Areas D,G, and I	Refer to Areas D,G, and I	Refer to Areas D,G, and I	Refer to Areas D,G, and I	N	N

In all cases the difference between design year noise level with the project and existing noise level is 4 dB or less. Accordingly, implementation of the project is not considered to result in a substantial increase in noise. The predicted incremental increase in noise associated with implementation of the proposed project is less than 2 dB in all cases. Because implementation of the proposed project is not considered to result in a substantial increase in noise and because the incremental increase in noise is small in all cases, the operational noise impacts of the project are considered to be less than significant.

The proposed project is not located within 2 miles of an airport or private airstrip.

2.2.6.3.2 Construction Impacts

During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction noise is regulated by Caltrans Standard Specifications Section 7-1.01I "Sound Control Requirements," which states that noise levels generated during construction shall comply with applicable local, state, and federal regulations, and that all equipment shall be fitted with adequate mufflers according to the manufacturers' specifications.

Table 2-7 summarizes noise levels produced by construction equipment that is commonly used on roadway construction projects. Construction equipment is expected to generate noise levels ranging from 70 to 90 dB at a distance of 15 m (50 ft), and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Table 2-7. Construction Equipment Noise

Equipment	Maximum Noise Level (dBA at 15 m [50 ft])
Scrapers	89
Bulldozers	85
Heavy Trucks	88
Backhoe	80
Pneumatic Tools	85
Concrete Pump	82

Source: FTA 1995.

No significant noise impacts from construction are anticipated because construction would be conducted in accordance with Caltrans Standard Specifications Section 7-1.01I and applicable local noise standards. Construction noise would be short-term, intermittent, and overshadowed by local traffic noise.

2.2.6.3.3 Supplemental Discussion of Federal Procedures for Abatement of Highway Traffic Noise (23 CFR 772)

In addition to considering whether the project would cause impacts as defined under CEQA and the State CEQA Guidelines, Caltrans must also determine if the proposed project will result in traffic noise "impacts" as defined under the requirements of Title 23 Part 772 of the Federal Code of Regulations (23 CFR 772). If traffic noise impacts are predicted to occur then noise abatement must be considered. Noise abatement that is determined to be reasonable and feasible must be identified before adoption of the final environmental document. Although the discussion of noise impacts under 23 CFR 772 is a Federal issue and is not required under CEQA, this discussion of the federal regulation is provided here to disclose conclusions of the analysis.

Caltrans has prepared a detailed noise study report to evaluate traffic noise impacts in accordance with 23 CFR 772. This report is available for review at the Caltrans District 4 office. The report identified several locations in the project area where noise abatement must be considered. A detailed evaluation of potential noise abatement options in the form of sound walls was conducted. The costs of implementing the noise abatement options were determined by the project engineer. This cost was then compared to reasonableness allowances calculated in accordance with procedures specified in the Caltrans Traffic Noise Analysis Protocol (Caltrans 1998). Table 2-8 summarizes key information on the barriers determined to be feasible. Figures E-1 through E-10 in Appendix E show the location of each barrier evaluated.

In all cases the costs of implementing the abatement exceeds the reasonableness allowances. The determination of final reasonableness of abatement will made upon completion of the public input process.

2.2.7 Topics Not Analyzed

"As part of the scoping and environmental analysis conducted for the project, the following environmental issues were considered but no adverse impacts were identified. Consequently there is no further discussion regarding these issues in this document."

- Paleontology

Table 2-8. Summary of Reasonableness Allowances and Cost Estimates of Feasible Evaluated Noise Barriers

	Height (ft)	Receivers Benefited	Existing Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level with Barrier, dBA-Leq[h]	Caltrans Reasonableness Allowance ($)	Estimated Construction Cost ($)	Cost-effective/Not Cost-effective
Replacement of Existing Walls in Fairfield								
B2	14	24	56-72	59-75	57-69	1,248,000	4,145,900	Not cost effective
	16	83			57-68	4,316,000	4,441,500	Not cost effective
B4A-option 1	10	1	70	72	67	36,000	196,400	Not cost effective
	12	1			66	38,000	211,200	Not cost effective
	14	1			65	38,000	225,000	Not cost effective
	16	1			64	38,000	268,800	Not cost effective
B4A-option 2	14	1	70	72	67	36,000	292,400	Not cost effective
	16	1			67	36,000	310,400	Not cost effective
B5	14	19	58-71	60-74	60-70	950,000	3,098,100	Not cost effective
	16	47			58-69	2,350,000	3,499,100	Not cost effective
New Walls Evaluated								
SB1-option 1	10	1	66-71	69-74	66-69	48,000	676,000	Not cost effective
	12	1			65-67	50,000	739,000	Not cost effective
	14	2			64-66	100,000	772,000	Not cost effective
	16	2			64-66	100,000	835,000	Not cost effective

Table 2-8. Continued

	Height (ft)	Receivers Benefited	Existing Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level with Barrier, dBA-Leq[h]	Caltrans Reasonableness Allowance ($)	Estimated Construction Cost ($)	Cost-effective/Not Cost-effective
SB1-option 2	10	1	66-71	69-74	66-71	48,000	1,081,900	Not cost effective
	12	1			65-67	50,000	1,223,500	Not cost effective
	14	2			64-66	100,000	1,334,100	Not cost effective
	16	2			64-66	100,000	1,444,700	Not cost effective
SB2-option 1	10	1	65	68	63	46,000	474,000	Not cost effective
	12	1			62	48,000	527,000	Not cost effective
	14	1			61	48,000	554,000	Not cost effective
	16	1			60	48,000	580,000	Not cost effective
SB2-option 2	12	1	65	68	63	46,000	1,551,900	Not cost effective
	14	1			63	46,000	1,717,900	Not cost effective
	16	1			63	46,000	1,853,900	Not cost effective
SB3-option 1	12	1	65	68	63	46,000	592,500	Not cost effective
	14	1			62	48,000	651,500	Not cost effective
	16	1			62	48,000	681,500	Not cost effective
SB3-option 2	12	1	656	68	62	48,000	1,741,500	Not cost effective
	14	1			62	48,000	1,907,500	Not cost effective
	16	1			62	48,000	2,060,500	Not cost effective

Table 2-8. Continued

	Height (ft)	Receivers Benefited	Existing Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level with Barrier, dBA-Leq[h]	Caltrans Reasonableness Allowance ($)	Estimated Construction Cost ($)	Cost-effective/Not Cost-effective
SB4-option 1	8	1	66-71	69-75	66-69	52,000	1,559,000	Not cost effective
	10	1			66-69	52,000	1,678,000	Not cost effective
	12	3			65-68	156,000	1,827,000	Not cost effective
	14	4			64-67	216,000	1,946,000	Not cost effective
	16	4			63-66	216,000	2,069,000	Not cost effective
SB4-option 2	8	1	66-71	69-75	66-71	50,000	1,473,500	Not cost effective
	10	2			65-70	100,000	1,656,500	Not cost effective
	12	4			64-68	208,000	1,839,500	Not cost effective
	14	4			63-67	208,000	2,023,500	Not cost effective
	16	4			63-66	216,000	2,206,500	Not cost effective
SB5	10	1	64	66	61	44,000	455,600	Not cost effective
	12	1			60	46,000	478,600	Not cost effective
	14	1			60	46,000	531,600	Not cost effective
	16	1			59	46,000	554,600	Not cost effective
SB6-option 1	8	1	64	66	61	44,000	428,600	Not cost effective
	10	1			60	46,000	455,600	Not cost effective
	12	1			69	46,000	478,600	Not cost effective

Table 2-8. Continued

	Height (ft)	Receivers Benefited	Existing Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level with Barrier, dBA-Leq[h]	Caltrans Reasonableness Allowance ($)	Estimated Construction Cost ($)	Cost-effective/Not Cost-effective
	14	1			58	46,000	531,600	Not cost effective
	16	1			58	46,000	554,600	Not cost effective
SB6-option 2	12	1	64	66	61	44,000	2,041,500	Not cost effective
	14	1			61	44,000	2,242,500	Not cost effective
	16	1			60	46,000	2,443,500	Not cost effective
SB7-option 1	8	1	65-72	67-75	65-71	50,000	982,000	Not cost effective
	10	6			65-68	312,000	1,069,000	Not cost effective
	12	6			65-67	312,000	1,158,000	Not cost effective
	14	7			64-66	378,000	1,244,000	Not cost effective
	16	7			63-66	378,000	1,333,000	Not cost effective
SB7-option 2	8	5	65-72	67-75	64-70	250,000	896,500	Not cost effective
	10	6			64-69	312,000	996,500	Not cost effective
	12	7			63-67	364,000	1,127,500	Not cost effective
	14	8			62-66	432,000	1,227,500	Not cost effective
	16	8			62-66	432,000	1,328,500	Not cost effective
SB8-option 1	10	1	66-69	68-71	65-66	46,000	716,000	Not cost effective
	12	4			64-65	192,000	752,000	Not cost effective

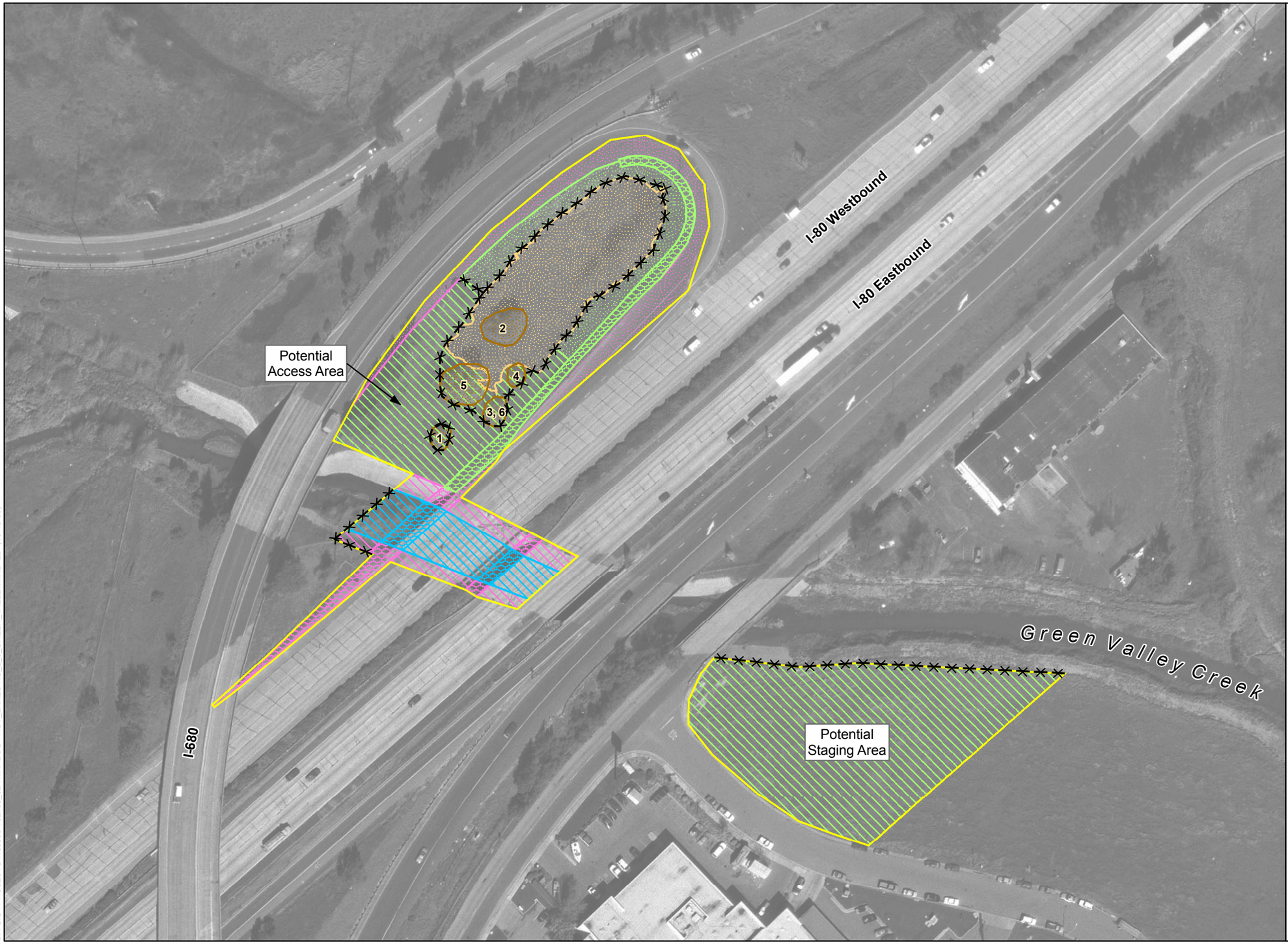
Table 2-8. Continued

	Height (ft)	Receivers Benefited	Existing Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level, dBA-Leq[h]	Predicted Design Year Noise Level with Barrier, dBA-Leq[h]	Caltrans Reasonableness Allowance ($)	Estimated Construction Cost ($)	Cost-effective/Not Cost-effective
	14	4			63-64	192,000	822,000	Not cost effective
	16	6			63	288,000	858,000	Not cost effective
SB8-option 2	12	3	66-69	68-71	64-66	144,000	1,277,500	Not cost effective
	14	6			63-65	288,000	1,425,500	Not cost effective
	16	6			63-65	288,000	1,543,500	Not cost effective
NR	6	7	65-78	66-80	63-75	350,000	671,400	Not cost effective
	8	7			63-74	364,000	765,000	Not cost effective
	10	8			63-73	416,000	857,600	Not cost effective
	12	8			63-71	432,000	951,200	Not cost effective
	14	8			62-70	432,000	1,044,800	Not cost effective
	16	8			62-70	432,000	1,138,400	Not cost effective

Note:
Refer to Figure E-1 through E-10 in Appendix E for the specific locations of each barrier evaluated.

Figure 2-5

Study Area and Biological Resources
in the I-80 HOV Lane Project
Solano County, California
September 2006



Legend

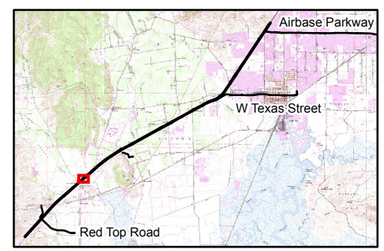
Impact Level
- No Impact
- Temporary Impact
- Permanent Impact

Habitat Types
- Annual Grassland
- Seasonal Wetland
- Drainage
- Developed

1 Native Tree (tree number, see Table 3-5 for species and size information)

Environmentally Sensitive Habitat Exclusion Fencing (to be installed by contractor)

Construction Work Area



100 50 0 100 Feet

N

Aerial Photo Source: Nolte Associates 2002, 2003

Prepared By:
Jones & Stokes Associates
2600 V St.
Sacramento, CA 95818
(916) 737-3000

Green Valley Creek

S:\ GIS \ PROJECTS \ I80680 \ 02166_02 \ MAPDOC \ HOV_LANES \ IS_2_5_GREEN_VALLEY.MXD LD (10-18-06)

Figure 2-6

Study Area and Biological Resources
in the I-80 HOV Lane Project
Solano County, California
September 2006



Legend

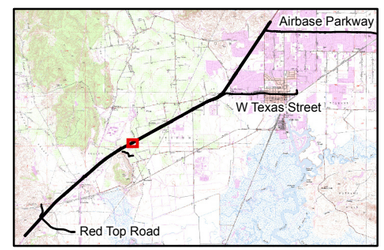
Impact Level

- No Impact
- Temporary Impact
- Permanent Impact

Habitat Types

- Riparian Woodland
- Drainage
- Developed

- Elderberry Shrub
- Environmentally Sensitive Habitat Exclusion Fencing (to be installed by contractor)
- Construction Work Area



100 50 0 100 Feet

N

Aerial Photo Source: Nolte Associates 2002, 2003

Prepared By:
Jones & Stokes Associates
2600 V St.
Sacramento, CA 95818
(916) 737-3000

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Suisun Creek



Figure 2-7

Study Area and Biological Resources
in the I-80 HOV Lane Project
Solano County, California
September 2006

Legend

Impact Level

Temporary Impact

Permanent Impact

Habitat Types

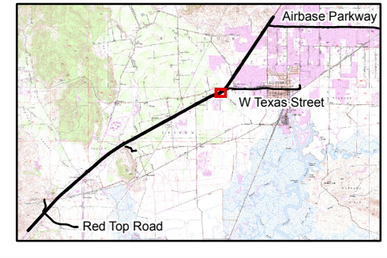
Annual Grassland

Drainage

Developed

Environmentally Sensitive Habitat Exclusion Fencing (to be installed by contractor)

Construction Work Area



100 50 0 100 Feet

N

Aerial Photo Source: Nolte Associates 2002, 2003

Prepared By:
Jones & Stokes Associates
2600 V St.
Sacramento, CA 95818
(916) 737-3000

Ledgewood Creek

S:\ GIS\ PROJECTS \ I80680 \ 02166_02 \ MAPDOC \ HOV_LANES \ IS_2_7_LEDGEWOOD.MXD LD (10-18-06)

2.3 Biological Environment

2.3.1 Biological Resources

The study area for the analysis of impacts to biological resources consists of the work areas for the construction work on the three bridges that cross water and where not constricted by I-80 or development, a 30.5 meter (100 foot) radius around the construction work areas (Figure 2-5 thru 2-7). All other construction will take place in the median and will not affect biological resources. This section addresses natural communities, wetlands and other waters, plant and animal species, threatened and endangered species, and invasive species. Information presented here is summarized from the NES prepared by Jones & Stokes (STA 2006g).

2.3.2 Natural Communities

This section of the document discusses natural communities of concern covered in Section 4.1 of the NES (STA 2006g). The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors, fish passage, and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed in section 2.3.6, Threatened and Endangered Species.

The study area supports three natural communities of special concern: riparian woodland, seasonal wetland, and drainages. Other parts of the study area support nonnative annual grassland habitat or are developed.

2.3.2.1 Riparian Woodland

2.3.2.1.1 Regulatory Setting

Riparian communities are considered sensitive locally, regionally, and statewide because of their habitat value and decline in extent. DFG has adopted a no-net-loss policy for riparian habitat values, and the Streambed Alteration Agreement (SAA) would include mitigation requirements for loss of riparian vegetation. USFWS mitigation policy identifies California's riparian habitats in Resource Category 2, for which no net loss of existing habitat value is recommended (46 FR 7644).

2.3.2.1.2 Existing Conditions

Riparian woodland occurs in the study area along Suisun Creek, but only outside the study area at Green Valley and Ledgewood Creeks. Riparian species that characterize riparian woodland at Suisun Creek include valley oak, willows, white alder, California buckeye, bay laurel, and Himalayan blackberry. Adjacent to the south side of the study area at Suisun Creek, riparian woodland also supports elderberry shrubs. Herbaceous groundcover consists of nonnative grasses, sedge species, mugwort, Bermuda grass, California wild rose, poison oak, and California wild grape. The west bank of Suisun Creek also supports a dense area of bigleaf periwinkle, an invasive species.

2.3.2.1.3 Impacts

Construction of the widened roadway and bridge on the south side of I-80 and the west bank of Suisun Creek will result in a permanent loss of approximately 0.001 hectare (0.002 acre) of riparian woodland within the project footprint (Figure 2-6). The permanent impact area is not anticipated to include any riparian trees, but it may include understory plants such as coyote brush and Himalayan blackberry.

Approximately 0.04 hectare (0.10 acre) of riparian woodland vegetation will be temporarily disturbed during construction. This impact will include the probable removal of two California buckeye trees on the west bank and a black willow on the east bank. In addition, understory coyote brush, Himalayan blackberry, and poison oak will be removed from both banks to provide equipment access to the streambed.

Indirect impacts on riparian woodland vegetation could occur from adjacent construction activity. Riparian vegetation is adjacent to the construction area and will not be removed for construction, but it could sustain damage from equipment. Most of the riparian trees that are not on the Suisun Creek banks are rooted outside the I-80 right-of-way, but the trunks are at the property fenceline and the canopy extends over the right-of-way. Implementation of the avoidance and minimization measures will protect trees and avoid this potential impact.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of riparian habitat. The loss or disturbance of riparian woodland vegetation is considered adverse because it provides a variety of important ecological functions and values.

Cumulative Impacts

Cumulative impacts on riparian vegetation would result from construction of other general development projects in Solano County. Construction of the proposed project would add to the cumulative loss of riparian habitats. However, with implementation of the mitigation measures prescribed for minimizing impacts and compensating for remaining impacts, the proposed project would not likely have a cumulatively adverse effect on riparian habitats.

2.3.2.1.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following avoidance and minimization measures will ensure that the proposed project minimizes effects on riparian habitat within and adjacent to the study area.

Avoidance and Minimization Measures

Mitigation Measure BIO-1: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Biological Resources to Be Avoided

STA or its contractor will install orange construction barrier fencing to identify environmentally sensitive areas. A qualified biologist will identify sensitive biological habitat at each bridge site before the final design plans are prepared so that the areas to be fenced can be included in the plans. The area that would generally be required for construction, including staging and access, is shown on Figures 2-5 through 2-7. Pockets of this area that are to be avoided during construction should be fenced off to avoid disturbance. Sensitive biological habitat that occurs adjacent to the construction area includes the three creek channels outside the construction zone, the seasonal wetland north of Green Valley Creek, protected trees north of Green Valley Creek,

Figure 2-7

Study Area and Biological Resources
in the I-80 HOV Lane Project
Solano County, California
September 2006

I-80 Westbound

I-80 Eastbound

Potential
Staging Area

Ledgewood Creek

Legend

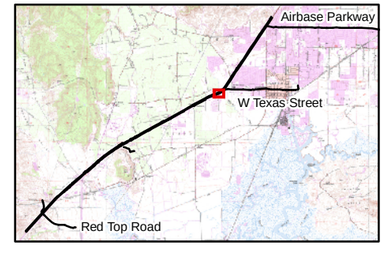
Impact Level

- Temporary Impact
- Permanent Impact

Habitat Types

- Annual Grassland
- Drainage
- Developed

- Environmentally Sensitive Habitat Exclusion Fencing (to be installed by contractor)
- Study Area



100 50 0 100 Feet

Aerial Photo Source: Nolte Associates 2002, 2003

Prepared By:
Jones & Stokes Associates
2600 V St.
Sacramento, CA 95818
(916) 737-3000

Ledgewood Creek

J:\ GIS \ PROJECTS \ I80680 \ 02166_02 \ ARCMAP \ HOV_LANES \ IS_2_7_LEDGEWOOD.MXD LD (09-11-06)

elderberry shrubs south of the Suisun Creek construction area, California buckeye and oak trees west of Suisun Creek, and any trees that support nests of special-status bird species.

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 (i.e., elderberry shrubs, seasonal wetland, native trees, trees that support nests of special-status birds) to indicate these locations. The protected areas will be designated as environmentally sensitive areas and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated and will be maintained throughout the construction period. The following paragraph will be included in the construction specifications:

> The contractor's attention is directed to the areas designated as "environmentally sensitive areas." These areas are protected, and no entry by the contractor for any purpose will be allowed unless specifically authorized in writing by Caltrans or the Solano Transportation Authority. The contractor will take measures to ensure that contractor's forces do not enter or disturb these areas, including giving written notice to employees and subcontractors. Vehicle operation, material and equipment storage, and other surface-disturbing activities are prohibited within the fenced environmentally sensitive areas.

Temporary fences around the environmentally sensitive areas will be installed as one of the first orders of work. Temporary fences will be furnished, constructed, maintained, and removed as shown on the plans, as specified in the special provisions, and as directed by the project engineer. The fencing will be commercial-quality woven polypropylene, orange in color, and at least 1.2 meters (4 feet) high (Tensor Polygrid or equivalent). The fencing will be tightly strung on posts set at maximum intervals of 3 meters (10 feet).

Mitigation Measure BIO-2: Retain a Biological Monitor to Conduct Weekly Visits during Construction in or near Green Valley, Suisun, and Ledgewood Creeks

STA will retain a biologist to conduct construction monitoring in and adjacent to Green Valley, Suisun, and Ledgewood Creeks. The biological monitor will assist the construction crew as needed to comply with all project implementation restrictions and guidelines. The biological monitor also will be responsible for ensuring that the contractor maintains the staked and flagged perimeters of the construction area and staging areas adjacent to sensitive biological resources.

Mitigation Measure BIO-3: Avoid and Minimize Potential Indirect Disturbance of Riparian Communities

To the extent possible, STA will avoid and minimize potential indirect disturbance of riparian communities by implementing the following measures:

- The potential for long-term loss of riparian vegetation will be minimized by trimming vegetation rather than removing entire shrubs. Shrubs that need to be trimmed will be cut at least 0.3 meter (1 foot) above ground level to leave the root systems intact and allow for more rapid regeneration. Cutting will be limited to the minimum area necessary within the construction zone. Cutting will be allowed only for shrubs; all trees will be avoided. Also, cutting will be allowed only in areas that do not provide habitat for sensitive species. To

Compensatory Mitigation

Mitigation Measure BIO-4: Compensate for Permanent and Temporary Loss of Riparian Vegetation
STA will compensate for temporary construction-related loss of riparian vegetation at Suisun Creek by replanting the access area with the native species removed, including California buckeye, black willow, and coyote brush. Replanting will occur after completion of the construction activities at Suisun Creek, and before October 1 to avoid impacts to fish.

STA will compensate for the permanent loss of riparian vegetation within the widened roadway at Suisun Creek at a minimum ratio of 1:1 (1 hectare/acre restored or created for every 1 hectare/acre permanently affected). This ratio will be confirmed through coordination with state and federal agencies as part of the permitting process for the proposed project. Compensation in this area can be easily achieved through onsite enhancement of 0.001 hectare (0.002 acre) within and adjacent to the study area (see Figure 2-8). The riparian area south of the I-80 Bridge at Suisun Creek could be enhanced by planting native woody species, including black willow, elderberry, buckeye, coyote brush, and other readily establishing native riparian species. Plantings will consist of cuttings taken from local plants, or plants grown from local material obtained within the Suisun Creek watershed. Plantings will be monitored annually for 3 years, or as required in the project permits. A minimum of 75 percent of the plantings will survive at the end of the monitoring period. If the survival criterion is not met at the end of the monitoring period, planting and monitoring will be repeated until the survival criterion is met. Additional enhancement measures could include removal of invasive species within the study area, such as bigleaf periwinkle, and replacement with a native cover, such as mugwort, grown from local stock.

2.3.2.2 Seasonal Wetland

2.3.2.2.1 Regulatory Setting
The seasonal wetland may be considered jurisdictional by the U.S. Army Corps of Engineers (Corps) and therefore subject to regulation under Clean Water Act (CWA) Section 404. Regardless of Corps jurisdiction, local, state, and federal agencies recognize seasonal wetlands as sensitive natural communities.

2.3.2.2.2 Impacts
The seasonal wetland east of Green Valley Creek could be indirectly affected by use of the adjacent area as an access route during construction associated with the widening of the Green Valley Creek bridge. Implementation of the following avoidance and minimization measures is expected to prevent this indirect impact. No additional mitigation is proposed.

Cumulative Impacts
Cumulative impacts on seasonal wetlands would result from construction of other general development projects in Solano County. Construction of the proposed project would not add to the cumulative loss of these habitats because the seasonal wetland will be avoided.



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Figure 2-8
Location of Proposed Riparian Habitat Enhancement on Suisun Creek

Regardless of Corps jurisdiction, local, state, and federal agencies recognize seasonal wetlands as sensitive natural communities.

2.3.2.2.2 Impacts

The seasonal wetland east of Green Valley Creek could be indirectly affected by use of the adjacent area as an access route during construction associated with the widening of the Green Valley Creek bridge. Implementation of the following avoidance and minimization measures is expected to prevent this indirect impact. No additional mitigation is proposed.

Cumulative Impacts

Cumulative impacts on seasonal wetlands would result from construction of other general development projects in Solano County. Construction of the proposed project would not add to the cumulative loss of these habitats because the seasonal wetland will be avoided.

2.3.2.2.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described under section 2.3.2.1, Riparian Woodland, and the following avoidance and minimization measure would ensure that the proposed project avoids direct effects and minimizes indirect effects on seasonal wetland habitat adjacent to the construction area.

Mitigation Measure BIO-5: Avoid and Minimize Potential Indirect Disturbance of the Seasonal Wetland near Green Valley Creek

STA will minimize the potential for indirect disturbance of the seasonal wetland in the Green Valley Creek portion of the study area by prohibiting the use of vehicles and equipment staging in the access area within the I-80/I-680 interchange loop north of I-80. All creek access by vehicle will occur via the cement-lined channel and access roadway south of I-80.

2.3.2.3 Drainages

2.3.2.3.1 Existing Conditions

The study area includes three drainages: Green Valley, Suisun, and Ledgewood Creeks. All of these creeks originate in the hills north of Fairfield. Green Valley Creek drains to Cordelia Slough, Suisun Creek to Chadbourne Slough, and Ledgewood Creek to Peytonia Slough. All three sloughs are tributaries to Suisun Slough, which drains to Suisun Bay.

Approximately 0.085 hectare (0.21 acre) of Green Valley Creek is within the study area. The ordinary high water mark (OHWM) of Green Valley Creek varies from approximately 15.2 to 18.3 meters (50 to 60 feet) wide throughout the study area. Green Valley Creek has a cement-lined bed and bank throughout the study area, although sediment deposits have built up in portions of the creek bed (Figure 2-9). These sediment "islands" support some emergent vegetation, including willow and cattail. The emergent vegetation was not separately mapped because it is transient and can be scoured during high flows. The open water and emergent vegetation habitats are considered to function as a single ecological unit.

Approximately 0.061 hectare (0.15 acre) of Suisun Creek is within the study area. The OHWM of Suisun Creek is approximately 18.3 meters (60 feet) wide. The creekbed is natural in the portion of the study area under the bridge. A pier wall extends the entire width of the bridge and

divides the creek down the center. Streamflow during the time of the survey was primarily through the east half of the bridge, whereas the west half was nearly dry. Mounds of sediment have deposited on the west half of the creek bed and support sparse vegetation. Downstream of the bridge, the creek is in a natural state and was open water with no emergent vegetation at the time of the survey (Figure 2-10).

Approximately 0.032 hectare (0.08 acre) of Ledgewood Creek is within the study area. The OHWM of Ledgewood Creek is approximately 9.1 meters (30 feet) wide. Within the study area, Ledgewood Creek has an entirely cement-lined bed and bank. However, unlike Green Valley and Suisun Creeks, there is not a substantial buildup of sediment within the creek in the study area (Figure 2-11).

2.3.2.3.2 Impacts

Construction associated with widening the I-80 bridges at Green Valley, Suisun, and Ledgewood Creeks would involve installation of cofferdams during construction and placement of bridge footings and abutments. Table 2-9 lists the extent of direct impacts (fill) anticipated in each creek based on the proposed bridge footing size (permanent fill) and the proposed extent of the cofferdams and falsework (temporary fill). Additional indirect impacts caused by sedimentation could occur in portions of the drainages outside the project footprint. The impact areas are preliminary, pending USACE verification of the OHWM for each creek.

Table 2-9. Direct Impacts on Drainages in the Study Area

Creek	Area of Temporary Fill (Hectares [Acres])[a]	Area of Permanent Fill (Hectares [Acres])[b]	Total Area of Fill (Temporary + Permanent)
Green Valley Creek	0.07 (017)	0.02 (0.04)	0.09 (0.21)
Suisun Creek	0.06 (0.14)	0.004 (0.01)	0.06 (0.15)
Ledgewood Creek	0.03 (0.07)	0.004 (0.01)	0.03 (0.08)
Total Direct Impacts	**0.16 (0.38)**	**<0.03 (0.06)**	**0.18 (0.44)**

[a] Includes temporary fill for cofferdam.

[b] Includes permanent fill for bridge structures.

Natural streams and connecting drainages are considered waters of the United States, protected under the Clean Water Act CWA Section 404. Placement of material in these areas, including cofferdams and bridge footings, would be considered placement of fill within waters of the United States. However, driving piles in Ledgewood Creek would not be considered fill. This activity would require Section 404 authorization from the USACE and a CWA Section 401 water quality certification from the RWQCB.

An SAA from DFG would be required for construction activity within drainages and their floodplains. No creeks in the study area are regulated by the State Lands Commission, and construction would not require a land lease amendment (Jones pers. comm.).

With implementation of the avoidance and minimization measures described in section 2.3.2.1, Riparian Woodland, the proposed project would not result in indirect impacts on drainages that are considered waters of the United States. Additional mitigation is proposed to compensate for the direct impacts on drainages.



Looking downstream from South side of I-80



Looking upstream from the North side of I-80



Looking West at seasonal wetland and native trees on North side of I-80

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Figure 2-9
Representative Photographs (Green Valley Creek)



Elderberry shrubs on east bank of creek south of I-80



Looking downstream from south side of i-80



Looking west across creek on the south side of i-80

02166.02 IS (09/06)

Figure 2-10
Representative Photographs (Suisun Creek)

Cumulative Impacts

Cumulative impacts on drainages would result from construction of other general development projects in Solano County. Construction of the proposed project would add to the cumulative loss of drainage habitats. However, with implementation of the mitigation measures referenced above, the proposed project would not likely have a cumulatively adverse effect on drainages.

2.3.2.3.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the avoidance and minimization measures described under section 2.3.2.1, Riparian Woodland, and the following avoidance and minimization measures would ensure that the proposed project avoids direct effects and minimizes indirect effects on seasonal wetland habitat adjacent to the construction area.

Mitigation Measure BIO-6: Protect Water Quality and Prevent Erosion in Drainages

To protect water quality in Green Valley, Suisun, and Ledgewood Creeks, STA will implement the following BMPs before and during construction:

- All earthwork or foundation activities involving creeks, culverts, and bridges will occur in the dry season (generally between June 1 and October 1).
- All work in the drainages that may contain fish will be limited to the low-flow period in the dry season.
- Equipment used in and around waters of the United States will be in good working order and free of dripping or leaking engine fluids. All vehicle maintenance, staging, and materials storage will occur at least 91 meters (300 feet) from all waters of the United States. Any necessary equipment washing will occur where the water cannot flow into the stream channel.
- Any surplus concrete rubble, asphalt, or other rubble from construction will be taken to the Solano County landfill.
- An erosion control plan will be prepared and implemented for the proposed project. It will include the following provisions and protocols:
  - Discharge from dewatering operations, if needed, and runoff from disturbed areas will be made to conform to the water quality requirements of the waste discharge permit issued by the RWQCB.
  - Material stockpiles will be located in non-traffic areas only. Side slopes will not be steeper than 2:1. All stockpile areas will be surrounded by a filter fabric fence and interceptor dike.
  - Erosion control measures will be applied throughout construction of the proposed project. The SWPPP for the project will detail the applications and type of measures and the allowable exposure of unprotected soils.
  - Soil exposure will be minimized through the use of temporary BMPs, groundcover, and stabilization measures. Exposed dust-producing surfaces will be sprinkled daily, if necessary, until wet; this measure will be controlled to avoid producing runoff. Paved streets will be swept daily following construction activities.

- The contractor will conduct periodic maintenance of erosion and sediment control measures.
- All temporary erosion and sediment control measures will be removed after the working area is stabilized or as directed by the engineer.
- An appropriate seed mix of native species will be planted on disturbed areas upon completion of construction.
- Sandbagged silt fences will be installed in all named and unnamed waterways in which construction work occurs, both upstream and downstream of the construction site. Any accumulated sediment will be removed and trucked to the Solano County landfill or an approved disposal site.

Mitigation Measure BIO-7: Obtain Required Permits, Authorizations, Certifications, and Agreements
Before construction, STA will obtain the following:

- CWA Section 404—NWP #14
- CWA Section 401—water quality certification
- CFGC Section 1602—SAA
- State Water Board—NPDES permit
- USFWS Section 7–Biological Opinion

All conditions that are attached to the state and federal permits would be implemented as part of the project. The conditions would be identified clearly in the construction plans and specifications, and monitored during and after construction to ensure compliance.

Compensatory Mitigation

Mitigation Measure BIO-8: Compensate for Permanent and Temporary Loss of Drainage Habitat
STA will compensate for the permanent fill of other waters of the United States (a direct impact associated with bridge footings and abutments) in drainages at a minimum ratio of 2:1 (2 hectares/acres restored or created for every 1 acre permanently affected). Because the proposed project will result in the loss of 0.03 hectare (0.06 acre) of other waters of the United States (Table 2-9), a minimum of 0.05 hectare (0.12 acre) of compensation will be required. Compensation will be accomplished by restoring and/or enhancing riparian and in-stream habitats in the study area. Green Valley and Ledgewood Creeks have no riparian habitat within the study area because these sections of the creek are concrete-lined. Therefore, restoration and enhancement efforts will focus on Suisun Creek in the study area (location of restoration/enhancement area is shown on Figure 2-8). Compensation for other waters of the United States will be in addition to and will follow the guidelines for riparian habitat compensation described in Mitigation Measure BIO-4.



Looking downstream from under i-80 bridge



Looking downstream from south side of I-80



Looking upstream from north side of I-80

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Figure 2-11
Representative Photographs (Ledgewood Creek)

Temporarily disturbed portions of the drainages will be returned to original grade following construction, and will result in no permanent impacts.

2.3.3 Wetlands and Other Waters

A total of 0.32 hectare (0.80 acre) of potential waters of the United States was delineated in the study area. An estimated 0.16 hectare (0.40 acre) of these potential waters of the United States in Green Valley, Suisun, and Ledgewood Creeks would be permanently or temporarily filled during construction of the proposed project.

2.3.3.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The Clean Water Act (CWA) regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States 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 vegetation, wetland hydrology, and hydric soils (soils subject to saturation or inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the USACE with oversight by the EPA.

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the FHWA, 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 DFG and the RWQCBs. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600-1607 of the 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 DFG before beginning construction. If DFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. DFG 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 DFG.

RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. A RWQCB also issues water quality certifications in compliance with Section 401 of the CWA. See section 2.2.2, Water Quality, for additional details.

2.3.3.2 Existing Conditions

The study area contains a total of 0.92 acre of potential jurisdictional waters of the United States (Table 2-10). This acreage includes 0.44 acre of potential other waters of the United States (drainage) and 0.48 acre of seasonal wetland (Figure 2-5). Potential jurisdictional areas within the study area are described above (section 2.3.2.3, Drainages).

Table 2-10. Acreage Summary of Waters of the United States by Type

Waters	Type	Total
Green Valley Creek	Drainage	0.21
Suisun Creek	Drainage	0.15
Ledgewood Creek	Drainage	0.08
Seasonal Wetland	Seasonal Wetland	0.48
Total		**0.92**

2.3.3.2.1 Seasonal Wetland

One seasonal wetland that contains positive indicators for all three wetland criteria is located east of Green Valley Creek within the I-80/I-680 interchange loop. Dominant species in this wetland are iris-leaved rush, Bermuda grass, curly dock, and Harding grass. Bermuda grass and Harding grass are considered invasive plant species. The wetland receives runoff via a culvert connected to another vegetated section of the I-80/I-680 interchange loop located to the west, as well as from the roadway that surrounds it. This wetland is less than 60.1 meters (200 feet) from the top of bank at Green Valley Creek and may drain to the creek during storm events. At the time of the 2004 survey, a fence truncated the west end of the wetland, but it had been removed by the time of the 2006 survey. Wetland hydrology was identified based on water observed in January 2006. Soil in this wetland revealed low chroma (dark) soils and contrasting redoximorphic features (mottles) in the soil matrix.

2.3.3.2.2 Perennial Drainage

The study area includes three drainages: Green Valley, Suisun, and Ledgewood Creeks. These drainages are described above in section 2.3.2.3, Drainages.

2.3.3.3 Impacts

See impacts under section 2.3.2.3, Drainages.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

See avoidance and minimization/mitigation measures under section 2.3.2.3, Drainages.

2.3.4 Plant Species

2.3.4.1 Regulatory Setting

The U.S. Fish and Wildlife Service (USFWS) and DFG share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare or subject to population and habitat declines. Special status is a general term for species that are afforded 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 (ESA) or the California Endangered Species Act (CESA). See section 2.3.6, Threatened and Endangered Species, for detailed information regarding these special-status species.

This section discusses all the other special-status plant species, including DFG fully protected species and species of special concern, USFWS candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for the federal ESA can be found at United States Code 16 (USC), Section 1531, et. seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found in California Fish and Game Code, Section 2050, et. seq. Department projects are also subject to the Native Plant Protection Act, found in Fish and Game Code, Section 1900-1913, and CEQA, Public Resources Code, Sections 2100-21177.

2.3.4.2 Existing Conditions

During the prefield investigation, 34 special-status plant species were determined to have the potential to occur in the project region (Table 2-11). Suitable plant communities and soil types for seven species were identified in the study area. However, the study area has a high level of disturbance from previous and ongoing activities such that suitable microhabitat conditions for special-status plant species are not present. Therefore, the study area has a low potential to support special-status plant species. Based on the lack of previously recorded occurrences and the negative results of spring botanical field surveys conducted in the study area, the botanist determined that the study area was unlikely to support summer-blooming special-status plant species.

No special-status plants have been previously recorded in or adjacent to the study area (California Natural Diversity Database 2005). Spring botanical surveys were conducted in April and May of 2004 and April and May of 2005 in the study area. No special-status plants were found during the survey (STA 2006g). Therefore, the proposed project would not result in impacts on special-status plant species.

2.3.4.3 Impacts

The proposed project would not result in impacts on special-status plant species.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization and/or mitigation measures are proposed because no special-status plants have previously been recorded or discovered during botanical surveys.

2.3.5 Animal Species

After biological field surveys were conducted and additional information was obtained from the resource agencies, the biologist determined that 10 sensitive species could occur within the study area or be affected by construction activities (see Table 2-12). Of these species, five are listed or proposed for listing as threatened or endangered species and are discussed in section 2.3.6, Threatened and Endangered Species, below. The remaining five species—northwestern pond turtle, white-tailed kite, Yuma myotis (roosting bat), river lamprey, and Pacific lamprey—are

discussed here. In addition, swallows and migratory birds are also addressed here because they are protected by state law.

2.3.5.1 Regulatory Setting

Many state and federal laws regulate impacts on wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) and the DFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under state or federal Endangered Species Act (ESA). Species listed or proposed for listing as threatened or endangered are discussed in section 2.3.6 below. All other special-status animal species are discussed here, including DFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act (MBTA)
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1601—1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

2.3.5.2 Northwestern Pond Turtle

Northwestern pond turtle is designated as a federal species of concern and state species of special concern. Northwestern pond turtle, one of two subspecies of western pond turtle, occurs from the vicinity of the American River in California to the lower Columbia River in Oregon and Washington (Jennings et al. 1992).

Western pond turtles are thoroughly aquatic, preferring the quiet waters of ponds, reservoirs, and sluggish streams (Stebbins 1985). The species occurs in a wide range of both permanent and intermittent aquatic environments (Jennings et al. 1992). Western pond turtles spend considerable time basking on rocks, logs, emergent vegetation, mud or sand banks, or human-generated debris. They move up to 396 meters (1,300 feet) or more to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994). Northwestern pond turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992).

2.3.5.2.1 Existing Conditions

No western pond turtles were observed within or adjacent to the study area during the January 2006 field surveys. However, turtles are not as active during winter and may have been present but not necessarily active and visible. There is moderate potential for western pond turtles to move through the study area. However, upland habitat within the study area occurs in heavily

Table 2-11. Sensitive Plant Species in the Project Region

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Suisun marsh aster *Aster lentus*	–	–	1B	Sacramento River–San Joaquin River Delta, Suisun Marsh, and Suisun Bay. Contra Costa, Napa, Sacramento, San Joaquin, and Solano Counties.	Tidal brackish and freshwater marsh below 500 feet above sea level.	May–November	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Alkali milk-vetch *Astragalus tener* var. *tener*	–	–	1B	Merced, Solano, and Yolo Counties. Historically more widespread.	Grassy flats and vernal pool margins on alkali soils below 200 feet above sea level.	March–June	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Heartscale *Atriplex cordulata*	–	–	1B	Western Central Valley and valleys of adjacent foothills.	Alkali grassland, alkali meadow, and alkali scrub below 660 feet above sea level.	April–October	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Brittlescale *Atriplex depressa*	–	–	1B	Western Central Valley and valleys of adjacent foothills on west side of Central Valley.	Alkali grassland, alkali meadow, alkali scrub, chenopod scrub, playas, and valley and foothill grasslands on alkaline or clay soils below 660 feet above sea level.	May–October	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Joaquin spearscale *Atriplex joaquiniana*	–	–	1B	West edge of Central Valley from Glenn County to Tulare County.	Alkali grassland, alkali meadow, alkali scrub, and saltbush scrub below 1,000 feet above sea level.	April–October	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Big-scale balsamroot *Balsamorhiza macrolepis* var. *macrolepis*	–	–	1B	Scattered occurrences in Coast Range and Sierra Nevada foothills.	Chaparral, cismontane woodland, valley and foothill grassland, sometimes on serpentine soils, at 300–4,600 feet above sea level.	March–June	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Narrow-anthered California brodiaea *Brodiaea californica* var. *leptandra*	–	–	1B	Lake, Napa, and Sonoma Counties.	Broadleaved upland forest, chaparral, and lower montane coniferous forest at 300–3,000 feet above sea level.	May–July	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Mt. Diablo fairy-lantern *Calochortus pulchellus*	–	–	1B	Endemic to Contra Costa County.	Cismontane woodland and chaparral.	April–June	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 2-11. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Tiburon Indian paintbrush *Castilleja affinis* ssp. *neglecta*	E	T	1B	San Francisco Bay Area. Marin, Napa, and Santa Clara Counties.	Serpentine grasslands.	April–June	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Holly-leaved ceanothus *Ceanothus purpureus*	–	–	4	Inner north Coast Range. Napa and Solano Counties.	Chaparral on volcanic, rocky substrate.	February–April	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Pappose spikeweed *Centromadia [Hemizonia] parryi* ssp. *parryi*	–	–	1B	Butte, Colusa, Glenn, Lake, Napa, San Mateo, Solano, and Sonoma Counties.	Coastal prairie, meadows and seeps, marshes and swamps, and mesic annual grassland, often on alkaline soils.	May–November	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
Suisun thistle *Cirsium hydrophilum* var. *hydrophilum*	E	–	1B	Suisun Marsh. Solano County.	Salt marsh.	July–September	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Hispid bird's-beak *Cordylanthus mollis* ssp. *hispidus*	–	–	1B	Central Valley. Alameda, Kern, Merced, Placer, and Solano Counties.	Meadow, grassland, and playa on alkaline soils below 500 feet above sea level.	June–September	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Soft bird's-beak *Cordylanthus mollis* ssp. *mollis*	E	R	1B	San Francisco Bay region and Suisun Marsh. Contra Costa, Marin[b], Napa, Solano, Sacramento[b], and Sonoma[b] Counties.	Tidal salt marsh.	July–September	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Recurved larkspur *Delphinium recurvatum*	–	–	1B	San Joaquin Valley and Central Valley of the south Coast Range. Contra Costa County to Kern County.	Subalkaline soils in annual grassland, saltbush scrub, cismontane woodland, and vernal pools at 100–2,000 feet above sea level.	March–May	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Dwarf downingia *Downingia pusilla*	–	–	2	Central Valley.	Vernal pools and valley and foothill grasslands.	March–May	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
Mt. Diablo buckwheat *Eriogonum truncatum*	–	–	1A	Historically known from Alameda, Contra Costa, and Solano Counties.	Coarse sandy soil in grasslands at 1,000–2,000 feet above sea level.	April–September	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 2-11. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Adobe lily *Fritillaria pluriflora*	–	–	1B	Northern Sierra Nevada foothills, inner Coast Range foothills, and Sacramento Valley. Butte, Colusa, Glenn, Lake, Napa, Plumas, Solano, Tehama, and Yolo Counties.	Adobe soil in chaparral, woodland, and valley and foothill grassland.	February–April	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Brewer's western flax *Hesperolinon breweri*	–	–	1B	Southern north inner Coast Range, northeast San Francisco Bay region, and Mt. Diablo. Contra Costa, Napa, and Solano Counties.	Serpentine slopes in chaparral and grasslands at 100–2,000 feet above sea level.	May–July	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Carquinez goldenbush *Isocoma arguta*	–	–	1B	Deltaic Sacramento Valley and Suisun Slough. Contra Costa and Solano Counties.	Annual grassland on alkaline soils and flats generally below 70 feet above sea level.	August–December	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Contra Costa goldfields *Lasthenia conjugens*	E	–	1B	Napa and Solano Counties.	Vernal pools and valley and foothill grasslands.	March–June	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	–	–	1B	Central Valley and San Francisco Bay region. Alameda, Contra Costa, Fresno, Marin, Napa, Sacramento, San Benito, Santa Clara, San Joaquin, and Solano Counties.	Coastal and estuarine marshes below 1,000 feet above sea level.	May–September	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Legenere *Legenere limosa*	–	–	1B	Central Valley.	Vernal pools.	April–June	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
Mason's lilaeopsis *Lilaeopsis masonii*	–	R	1B	Southern Sacramento Valley, Sacramento River–San Joaquin River Delta, and northeast San Francisco Bay Area. Alameda, Contra Costa, Marin[b], Napa, Sacramento, San Joaquin, and Solano Counties.	Freshwater and intertidal marshes, as well as tidal streambanks in riparian scrub, generally at sea level.	April–November	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

Table 2-11. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Baker's navarretia *Navarretia leucocephala* ssp. *bakeri*	–	–	1B	North Coast Range.	Vernal pools and swales.	May–July	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
Colusa grass *Neostapfia colusana*	T	E	1B	Central Valley. Colusa[b], Glenn[b], Merced, Solano, Stanislaus, and Yolo Counties.	Adobe soils of vernal pools generally below 650 feet above sea level.	May–September	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
San Joaquin Valley orcutt grass *Orcuttia inaequalis*	T	E	1B	Scattered locations along east edge of the San Joaquin Valley and adjacent foothills, from Stanislaus County to Tulare County.	Vernal pools.	April–September	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
Bearded popcorn-flower *Plagiobothrys hystriculus*	–	–	1A	Endemic to Solano[b] County. Last recorded in 1892 (California Natural Diversity Database 2005); rediscovered in 2005.	Mesic grasslands and vernal pools.	April–May	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
California beaked-rush *Rhynchospora californica*	–	–	1B	Scattered occurrences in northern California. Butte, Mariposa, Marin, and Sonoma Counties.	Freshwater marshes and seeps, bogs and fens, and lower montane coniferous forest.	May–July	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Marin checkerbloom *Sidalcea hickmanii* ssp. *viridis*	–	–	1B	Sonoma County to San Mateo County.	Openings in chaparral on volcanic or serpentinite substrates.	May–June	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Showy Indian clover *Trifolium amoenum*	E	–	1B	Sonoma County and Solano[b] County (one record, last observed in 1902 (California Natural Diversity Database 2005).	Low, rich fields and swales.	April–June	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.
Saline clover *Trifolium depauperatum* var. *hydrophilum*	–	–	1B	Alameda, Monterey, Napa, San Benito, Santa Clara, San Luis Obispo, San Mateo, Solano, and Sonoma Counties.	Marshes, mesic/alkaline annual grassland, and vernal pools.	April–June	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.
Greene's tuctoria *Tuctoria greenei*	E	R	1B	Scattered distribution along eastern Central Valley and foothills from Shasta County to Tulare County.	Dry vernal pools at 30–1,070 meters (100–3,500 feet) above sea level.	May–September	No	Potentially suitable habitat in the study area is too degraded or disturbed to support this species.

Table 2-11. Continued

Common Name, *Scientific Name*	Legal Status[a]			Geographic Distribution	Habitat Requirements	Blooming Period	Habitat Present in Study Area?	Rationale
	Federal	State	CNPS					
Oval-leaved viburnum *Viburnum ellipticum*	–	–	2	Northwest California, San Francisco Bay Area, and north and central Sierra Nevada foothills. Contra Costa, Fresno, El Dorado, Glenn, Humboldt, Mendocino, Napa, Shasta, and Sonoma Counties, as well as Oregon and Washington.	Chaparral, cismontane woodland, and lower montane coniferous forest.	May–June	No	No suitable vegetation communities, soils, or hydrologic conditions are present in the study area.

[a] Status explanations:

– = no listing.

Federal
E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.

State
E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
R = listed as rare under the California Native Plant Protection Act; this category is no longer used for newly listed plants, but some plants previously listed as rare retain this designation.

California Native Plant Society
1A = List 1A species: presumed extinct in California.
1B = List 1B species: rare, threatened, or endangered in California and elsewhere.
2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.
4 = List 4 species: limited distribution—a watch list.

[b] Known populations believed extirpated from that county.

Table 2-12. Sensitive Wildlife and Fish Species Potentially Occurring in the Project Region

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Rationale
	Federal	State				
Invertebrates						
Conservancy fairy shrimp *Branchinecta conservatio*	E	–	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties.	Large deep vernal pools in annual grasslands.	Absent	No suitable habitat is present in or near the study area.
Vernal pool fairy shrimp *Branchinecta lynchi*	T	–	Central Valley and central and south Coast Range from Tehama County to Santa Barbara County. Isolated populations also in Riverside County.	Common in vernal pools. Also found in sandstone rock outcrop pools.	Absent	No suitable habitat is present in or near the study area.
Vernal pool tadpole shrimp *Lepidurus packardi*	E	–	Shasta County to Merced County.	Vernal pools and ephemeral stock ponds.	Absent	No suitable habitat is present in or near the study area.
California freshwater shrimp *Syncaris pacifica*	E	E	Endemic to Marin, Napa, and Sonoma Counties. Extant populations in Lagunitas Creek in Marin County; Huichica Creek in Napa County; and Franz, East Austin, Sonoma, and Salmon Creeks in Sonoma County.	Pool areas of low-elevation, low-gradient, permanent streams; among live tree roots of undercut banks; and under overhanging woody debris or vegetation.	Absent	The study area is outside the known range of the species (53 Federal Register 43884).
Delta green ground beetle *Elaphrus viridus*	T	–	Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve in central Solano County.	Sparsely vegetated edges of vernal lakes and pools, occurring up to 250 feet from pools.	Absent	The study area is outside the known range of the species. The closest record occurs about 13 miles east of the study area at Jepson Prairie Preserve.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T	–	Streamside habitats below 3,000 feet above sea level throughout the Central Valley.	Riparian and oak savanna habitats with elderberry shrubs and streamside habitats below 3,000 feet above sea level. Elderberries are the host plant.	Present	Suitable habitat exists within riparian habitat along the east bank of Suisun Creek, approximately 75 feet south of proposed construction activities.
Callippe silverspot *Speyeria callippe callippe*	E	–	San Bruno Mountains, San Mateo County, and a single location in Alameda County.	Open hillsides where wild pansy (*Viola pedunculata*) grows. Larvae feed on Johnny jump-up plants, whereas adults feed on native mints and non-native thistles.	Absent	The study area is outside the known range for the species. No Johnny jump-up plants were located in the study area during the 2004 and 2005 floristic surveys.
Amphibians						
California red-legged frog *Rana aurora draytoni*	T	SSC	Along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehema County to Fresno County.	Permanent and semi-permanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods.	Present	Drainages in the study area provide potential aquatic habitat.

Table 2-12. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Rationale
	Federal	State				
California tiger salamander *Ambystoma californiense*	PT	SSC	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet above sea level and coastal region from Butte County to northeastern San Luis Obispo County	Valley floor grasslands or low (below 1,500 feet above sea level) foothill elevations where lowland aquatic sites like large vernal pools, playa pools, sag ponds, and stock ponds are available for breeding. Upland habitat consists of small mammal burrows within approximately 2,200 feet of breeding habitat.	Absent	No vernal pools or other suitable aquatic habitat are present in or near the study area.
Reptiles						
Giant garter snake *Thamnophis couchi gigas*	T	T	Central Valley from the vicinity of Burrel in Fresno County to near Chico in Butte County. Extirpated from areas south of Fresno.	Sloughs, canals, low-gradient streams, and freshwater marshes where there is a prey base of small fish and amphibians. Also irrigation ditches and rice fields. Requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	Absent	The study area is on the edge of the species' range. Green Valley, Suisun, and Ledgewood Creeks in the study area do not provide suitable habitat (marsh and slough).
Northwestern pond turtle *Clemmys marmorata marmorata*	SC	SSC	Occurs from the Oregon border of Del Norte and Siskiyou Counties along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of the Sierra Nevada.	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests.	Present	Suitable aquatic habitat is present within the study area. Surveys conducted as part of the Solano County Water Agency's Wildlife Habitat Monitoring Program indicate that the species is present within the Dan Wilson Creek/Green Valley Creek watershed (Solano County Water Agency 2005).
Birds						
Bald eagle *Haliaeetus leucocephalus*	T	E	Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and the Lake Tahoe Basin. Reintroduced into central coast. Winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County.	In western North America, nests and roosts in coniferous forests within 1 mile of a lake, reservoir, stream, or the ocean.	Absent	No suitable nesting or foraging habitat (coniferous forest) is present in the study area.

Table 2-12. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Rationale
	Federal	State				
Northern harrier *Circus cyaneus*	–	SSC	Throughout lowland California. Has been recorded in fall at high elevations.	Grasslands, meadows, marshes, and seasonal and agricultural wetlands.	Absent	No suitable nesting or foraging habitat (marsh or tall grasslands) is present in the study area.
White-tailed kite *Elanus leucurus*	–	FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills, to western San Diego County at the Mexico border.	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	Present	Riparian habitat along Green Valley, Suisun, and Ledgewood Creeks provides potential nesting habitat in the study area.
Swainson's hawk *Buteo swainsoni*	–	T	Lower Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County.	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields.	Present	Riparian habitat along Green Valley, Suisun, and Ledgewood Creeks provides potential nesting habitat in the study area.
Western burrowing owl *Athene cunicularia hypugea*	SC	SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast.	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows.	Absent	No suitable nesting habitat (open grasslands with suitable burrows) is present in the study area.
Loggerhead shrike *Lanius ludovicianus*	–	SSC	Resident and winter visitor in lowlands and foothills throughout California. Rare on coastal slope north of Mendocino County, occurring only in winter.	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Absent	Potential migrant through the study area, but no suitable nesting habitat (open grasslands with scattered shrubs) is present.
California clapper rail *Rallus longirostris oboletus*	E	–	Marshes around San Francisco Bay and east through the Sacramento River–San Joaquin River Delta to Suisun Marsh.	Restricted to salt marshes and tidal sloughs. Usually associated with heavy growth of pickleweed. Feeds on mollusks removed from the mud in sloughs.	Absent	No suitable habitat (marsh and slough) is present in the study area.
California least tern *Sterna antillarum*	E	E	Nests on beaches along San Francisco Bay and along the southern California coast from southern San Luis Obispo County to San Diego County.	Nests on sandy, upper ocean beaches, and occasionally uses mudflats. Forages on adjacent surf line, estuaries, or the open ocean.	Absent	No suitable habitat (sandy beaches and mudflats) is present in the study area.
Western yellow billed cuckoo *Oncorhynchus americanus occidentalis*	C	E	Nests along the upper Sacramento, lower Feather, south fork of Kern, Amargosa, Santa Ana, and Colorado Rivers.	Wide, dense riparian forests with a thick understory of willows for nesting. Sites with a dominant cottonwood overstory are preferred for foraging. May avoid valley-oak riparian habitats where scrub jays are abundant.	Absent	No suitable habitat (dense riparian habitat) is present in the study area.

Table 2-12. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Rationale
	Federal	State				
Mammals						
Riparian (San Joaquin Valley) woodrat *Neotoma fuscipes riparia*	E	SSC, FP	Historical distribution along the San Joaquin, Stanislaus, and Tuolumne Rivers, and Caswell State Park in San Joaquin, Stanislaus, and Merced Counties. Presently limited to San Joaquin County at Caswell State Park and a possible second population near Vernalis.	Riparian habitats with dense shrub cover, willow thickets, and an oak overstory.	Absent	The study area is outside the known range of the species. The closest known population occurs approximately 50 miles southeast of the study area along Paradise Cut in the Sacramento River–San Joaquin River Delta (California Natural Diversity Database 2005).
Salt marsh harvest mouse *Reithrodontomys raviventris*	E	E, FP	Vicinity of San Francisco, San Pablo, and Suisun Bays and the Sacramento River–San Joaquin River Delta.	Salt marshes with a dense plant cover of pickleweed and fat hen. Adjacent to an upland site.	Absent	No suitable habitat (salt marsh) is present in the study area.
Yuma myotis *Myotis yumanensis*	SC	–	Considered common and widespread in northern California up to 5,000 feet above sea level. Colonies known from Marin and San Francisco Counties.	Found in desert scrub, pinyon-juniper woodlands, and other open woodlands and forests. Open water is a key habitat element for this species. Roosts colonially in a variety of natural and artificial sites, including caves, mines, buildings, bridges, and trees.	Present	Bridges in study area provide potential roosting sites.
Small-footed myotis *Myotis ciliolabrum*	SC	–	Sierra Nevada; south Coast, Transverse, and Peninsular Ranges; and Great Basin at mid- to and high elevations. May also be found at low elevations in some deserts.	Occurs in a variety of habitat types, including desert scrub, grasslands, oak and pinyon juniper woodlands, and pine forests. Roosts are found primarily in cavities in mines and trees, but also in rock faces and clay banks, beneath bark on trees, and in barns.	Absent	No suitable roosting habitat is present in the study area. This species does not roost in bridges, and no potential tree roosts occur in the study area.
Long-legged myotis *Myotis volans*	SC	–	Throughout California from near sea level along the coast to high elevations in the Sierra Nevada and White Mountains.	Occurs in pinyon-juniper, Joshua tree woodland, montane coniferous forest habitats, and forested habitat along the coast. May also be found in streamside and arid habitats. Roosts in hollow trees, rock crevices, mines, and buildings.	Absent	No suitable roosting habitat is present in the study area. This species does not roost in bridges, and no potential tree roosts occur in the study area.
Fish						
Delta smelt *Hypomesus transpacificus*	T	T	Sacramento River–San Joaquin River Delta	Euryhaline estuary channels.	Absent	The project is located in inland freshwater stream habitats draining to Suisun Marsh.

Table 2-12. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Rationale
	Federal	State				
Coho salmon—Central California Coast Evolutionarily Significant Unit *Oncorhynchus kisutch*	E	E	Coastal streams from San Francisco Bay to Punta Gorda and coastal marine waters from California to Alaska.	Coastal anadromous coldwater streams.	Absent	The project is located in inland freshwater stream habitats draining to Suisun Marsh.
Central California Coast steelhead Distinct Population Segment (DPS) *Oncorhynchus mykiss*	T	–	Coastal streams from Russian River to Aptos Creek; tributaries to San Francisco, San Pablo, and Suisun Bays; Suisun Marsh; and coastal marine waters off California.	Coldwater anadromous streams.	Present	The project is located in inland freshwater stream habitats draining to Suisun Marsh. Species occurrence documented. Study area is not included in critical habitat.
California Central Valley Steelhead DPS *Oncorhynchus mykiss*	T	–	The Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo Bays and their tributaries, and coastal marine waters off California.	Coldwater anadromous streams.	Absent	Project area outside the range of this DPS.
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytsha*	T	T	Tributaries to the upper Sacramento River, primarily Butte, Big Chico, Deer, and Mill Creeks, and coastal marine waters off California.	Higher-elevation tributaries to the Sacramento River.	Absent	The project area is not located within current distribution of this run. Study area is not included in critical habitat.
Winter-run Chinook salmon *Oncorhynchus tshawytsha*	E	E	Upper mainstem Sacramento River, Sacramento River–San Joaquin River Delta (juveniles), and coastal marine waters off California.	Spring-fed headwaters to the Sacramento River.	Absent	The project area is not located within current distribution of this run. Study area is not included within critical habitat.
River lamprey *Lampetra ayresi*	SC	SSC	Exact range unknown, but includes coastal streams from Alaska to San Francisco Bay. In California, within lower Sacramento and San Joaquin Rivers, Napa River, Sonoma Creek, Alameda Creek, Salmon Creek, Russian River tributaries, and tributaries to San Francisco Bay.	Habitat requirements poorly understood, but include anadromous streams with gravel riffle for spawning and soft-bottomed areas for rearing.	Present	The project is located in inland freshwater anadromous stream habitats draining within the range of the species.
Pacific lamprey *Lampetra tridentata*	SC	–	Pacific Ocean marine waters and coastal streams from Japan to Baja California.	Habitat requirements poorly understood, but include anadromous streams with gravel riffle for spawning and soft-bottomed areas for rearing.	Present	The project is located in inland freshwater anadromous stream habitats draining within the range of the species.
Sacramento splittail *Pogonichthys macrolepidotus*	SC	SSC	Largely confined to Sacramento River–San Joaquin River Delta, Napa River, Petaluma River, Sacramento River, and Suisun Marsh.	Shallow-water, low-salinity habitats throughout slow areas of rivers and sloughs; areas of flooded vegetation for spawning and rearing.	Absent	The project area does not include large rivers and is not within the primary range of the species.

Table 2-12. Continued

Common Name, *Scientific Name*	Legal Status[a]		Geographic Distribution	Habitat Requirements	Habitat Present in Study Area?	Rationale
	Federal	State				
Green sturgeon *Acipenser medirostris*	P	SSC	In marine waters of the Pacific Ocean from the Bering Sea to Ensenada, Mexico. In rivers from British Columbia south to the Sacramento River, primarily in the Klamath/Trinity and Sacramento Rivers.	Primarily marine, using large anadromous freshwater rivers and associated estuaries for spawning and rearing.	Absent	The project area does not include large rivers and is not within the primary range of the species.
Central Valley fall/late fall–run Chinook salmon *Oncorhynchus tshawytsha*	SC	–	Sacramento and San Joaquin Rivers and their tributaries, as well as some tributaries to San Francisco Bay.	Lower-elevation coldwater anadromous streams.	Present	The project is located in inland freshwater anadromous stream habitats draining to Suisun Marsh, designated essential fish habitat. Species occurrence documented.
Longfin smelt *Spirinchus thaleichthys*	SC	SSC	Within California, mostly in the Sacramento River–San Joaquin River Delta, but also in Humboldt Bay, Eel River estuary, and Klamath River estuary.	Salt or brackish estuary waters with freshwater inputs for spawning.	Absent	The project is located in inland freshwater stream habitats draining to Suisun Marsh.

[a] Status explanations:

– = no listing.

Federal
E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.
P = officially proposed (in the Federal Register) for listing as endangered or threatened.
C = candidate to become a proposed species.

State
E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
FP = fully protected under the California Fish and Game Code.
SSC = species of special concern in California.

disturbed areas along I-80 and does not provide suitable nesting or overwintering habitat for pond turtles. In addition, the banks of the creeks in the study area are steep, so it would be difficult for pond turtles to move into upland areas.

2.3.5.2.2 Impacts

Suitable upland habitat for pond turtles is not present within the study area. Western pond turtles are very sensitive to disturbances and quickly retreat into the water when threatened. If pond turtles are present in the creek channel or along the creek bank during the construction period, it is expected that they would move out of the way of construction equipment and would not be harmed.

Cumulative Impacts

Western pond turtles will be avoided during project construction. No cumulative impacts on the species are anticipated.

2.3.5.2.3 Avoidance, Minimization, and/or Mitigation Measures

No impacts on western pond turtle are anticipated. Therefore, no avoidance and minimization measures are required.

Compensatory Mitigation

No compensatory mitigation for western pond turtles is recommended.

2.3.5.3 White-Tailed Kite

White-tailed kite is a fully protected species under CFGC 3511. The species has a restricted distribution in the United States, occurring only in California and western Oregon and along the Texas coast (American Ornithologists' Union 1983). The species is fairly common in California's Central Valley lowlands. White-tailed kites nest in riparian and oak woodlands and forage in nearby grasslands, pastures, agricultural fields, and wetlands. White tailed kites use nearby treetops for perching and nesting sites. Voles and mice are common prey species.

2.3.5.3.1 Existing Conditions

No white-tailed kite nest sites are known from the study area or within an 8-kilometer (5-mile) radius around the study area (California Natural Diversity Database 2005). Riparian habitat within and adjacent to the study area provides potential nesting habitat for white-tailed kites. However, it is unlikely that white-tailed kites would nest in the study area because of its close proximity to I-80. Annual grasslands in the study area are located along I-80 and within developed portions of Fairfield. These areas are not typically used by white-tailed kites for foraging. Higher-quality foraging habitat (open agricultural fields) occurs in the project vicinity.

2.3.5.3.2 Impacts

The proposed project would result in a permanent loss of approximately 0.001 hectare (0.002 acre) and temporary disturbance of 0.04 hectare (0.10 acre) of riparian woodland within and adjacent to the study area, which provides potential nesting habitat for white-tailed kites. Although there is a low likelihood that white-tailed kites would nest adjacent to I-80, tree removal or noise associated with construction activities could result in the disturbance of nesting white-tailed kites if active nests are present within or near the construction area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential

at active nests located in or near the study area. Such disturbance would violate CFGC 3503.5 and 3511 and MBTA.

Cumulative Impacts

The proposed project would result in the permanent loss of approximately 0.001 hectare (0.002 acre) and temporary disturbance of 0.04 hectare (0.10 acre) of riparian woodland that provides potential nesting habitat for white tailed kites. Because this habitat occurs along I-80 and is unlikely to be used by nesting white-tailed kites, the loss of this small amount of habitat located along I-80 would not be cumulatively considerable and cumulative impacts to white-tailed kites from the proposed project are not anticipated.

2.3.5.3.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described under sections 2.3.2.1, Riparian Woodland, and 2.3.6.2, Swainson's Hawk, would avoid and minimize impacts on nesting white-tailed kites.

Compensatory Mitigation

No compensatory mitigation for white-tailed kites is recommended.

2.3.5.4 Migratory Birds and Raptors

Several migratory birds and raptors could nest in and adjacent to the study area. The breeding season for most birds is generally from March 1 to August 15. The occupied nests and eggs of these birds are protected by federal and state laws, including the Migratory Bird Treaty Act (MBTA) and CFGC 3503 and 3503.5.

2.3.5.4.1 Existing Conditions

Potential nesting habitat for migratory birds and raptors occurs within riparian habitat along Green Valley, Suisun, and Ledgewood Creeks in the study area. Because the January 2006 wildlife field surveys were conducted outside the breeding season for migratory birds and raptors, a focused nest search was not conducted in the study area.

2.3.5.4.2 Impacts

Implementation of the proposed project could affect nesting birds, including raptors, if construction activities remove or otherwise disturb occupied nests during the breeding season. Construction activities during the breeding season that result in death of young or loss of reproductive potential would violate CFGC 3503 and 3503.5 and MBTA.

Cumulative Impacts

The proposed project will avoid removal of occupied migratory bird and raptor nests. No cumulative impacts are anticipated.

2.3.5.4.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described under sections 2.3.2.1, Riparian Woodland, and 2.3.6.2, Swainson's Hawk, would avoid and minimize impacts on nesting migratory birds and raptors.

Compensatory Mitigation
No compensatory mitigation for migratory birds and raptors is recommended.

2.3.5.5 Swallows
Swallows are not considered sensitive wildlife species. However, their occupied nests and eggs are protected by both federal and state laws, including MBTA. Cliff and barn swallows are two swallow species that frequently build mud nests on the undersides of artificial structures, such as bridges. The two species winter in South America and return to California to breed in February. Nesting generally occurs from March to August, and migration south occurs in September and October (Zeiner et al. 1990).

2.3.5.5.1 Existing Conditions
Empty and remnant swallow nests were observed on the undersides of the bridge decks and ledges within the study area. Because the January 2006 field surveys were conducted outside the breeding season (March 1 through August 15), no active swallow nests were observed. Because evidence of past use was identified, swallows could occupy the bridges later in the season.

2.3.5.5.2 Impacts
Construction activities associated with bridge construction could result in the direct loss of active swallow nests. Loss of a nest could in turn result in the death of adults, young, or eggs. This would violate CFGC 3503 and MBTA.

Cumulative Impacts
The proposed project will avoid removal of occupied swallow nests. No cumulative impacts are anticipated.

2.3.5.5.3 Avoidance, Minimization, and/or Mitigation Measures
Implementation of the following avoidance and minimization measure would ensure that swallows do not begin nesting on bridge structures before the start of construction.

Mitigation Measure BIO-9: Install Exclusion Netting on the Undersides of Bridges to Prevent Swallows from Nesting Adjacent to New Bridge Construction
To avoid impacts on nesting swallows and other bridge-nesting migratory birds that are protected under MBTA and CFGC, STA will implement the following measures:

- If bridge construction will take place during the breeding season (generally between March 1 and August 15), STA or its contractor will hire a qualified wildlife biologist to inspect the Green Valley Creek, Suisun Creek, and Ledgewood Creek bridges during the swallows' non-breeding season (August 16 through February 28). If nests are found and are abandoned, they may be removed. To avoid damaging active nests adjacent to new bridge construction, nests must be removed before the breeding season begins (March 1).
- After nests are removed, the undersides of the bridges will be covered with 1.3- to 1.9-centimeter (0.5- to 0.75-inch) mesh net or poultry wire. All net installation shall occur before March 1. The netting shall be anchored so that swallows cannot attach their nests to the bridge through gaps in the net.

- If netting of the bridges does not occur by March 1 and swallows colonize the bridge, modifications to this structure should not begin before August 15 of that year or until a qualified biologist has determined that the young have fledged and all nest use has been completed.

If appropriate steps are taken to prevent swallows from constructing new nests, work can proceed at any time of the year.

Compensatory Mitigation
No compensatory mitigation for nesting swallows is recommended.

2.3.5.6 Yuma Myotis (Roosting Bats)
Crevices, including expansion joints, on the undersides of bridges provide potential roosting and maternity sites for bats. Bats commonly use bridges that are located over perennial waterways or are in or near open agricultural or grassland areas. These areas provide an abundant source of insects, the primary food source for bats.

2.3.5.6.1 Existing Conditions
At the time of the January 2005 field survey, no evidence of bat presence (guano, urine staining, odor, or vocalizations) was observed on portions of the undersides of the existing bridges over Green Valley, Suisun, and Ledgewood Creeks. However, the undersides of the bridge decks contained expansion joints that could provide roosting sites for bats. These areas are not large enough to support a maternal colony but could support day or night roosting bats.

2.3.5.6.2 Impacts
Potential bat roosting areas occur within portions of the existing bridges over Green Valley, Suisun, and Ledgewood Creeks that will not be directly disturbed during new bridge construction and no roosting habitat will be removed. Noise disturbances associated with new bridge construction and pile driving could disturb day-roosting bats if they are present within the bridge during construction. However, these disturbances would be temporary and would not result in the death of a large number of bats.

Cumulative Impacts
The proposed project will not affect roosting bats. No cumulative impacts are anticipated.

2.3.5.6.3 Avoidance, Minimization, and/or Mitigation Measures
The proposed project will not remove bat roosting habitat. Noise disturbances would be temporary and no avoidance or minimization measures are recommended.

Compensatory Mitigation
The proposed project will not remove bat roosting habitat. No compensatory mitigation is recommended.

2.3.5.7 River Lamprey
River lamprey (*Lampetra ayressii*) is currently listed by DFG (2006) and USFWS (2005) as a species of special concern. Although it is widely believed to be in decline, the exact status of this species is uncertain. Currently, very little information describing the abundance and distribution

of river lamprey is available, perhaps largely in part because the species is often overlooked and seldom studied. River lamprey is thought to occur throughout Pacific coast streams, but its occurrence in California includes tributaries to San Francisco Bay such as the Napa River, Sonoma Creek, and Alameda Creek, as well as the Sacramento, San Joaquin, and Russian Rivers (Moyle et al. 1995; Moyle 2002).

Limited information is available regarding the life history of this species in California. Current accounts are based largely on information from Canadian populations (Moyle 2002). River lamprey is a semelparous (i.e., reproducing only once) anadromous fish with long freshwater rearing periods. Adults return to fresh water to spawn in fall and winter, but spawning usually occurs from February through March in gravelly riffles in small tributary streams (Moyle 2002). Juvenile river lamprey (ammocoetes) remain in silty backwater habitats, where they filter feed on various microorganisms for approximately 3–5 years before migrating to the ocean during late spring periods (Moyle et al. 1995; Moyle 2002). Adult lamprey prey on other fish and may reach a total length of around 17 centimeters (Moyle et al. 1995).

2.3.5.7.1 Existing Conditions

River lamprey could occur in the study area, although their occurrence has not been documented. The study area is encompassed by the species' known distribution in California and all three creeks appear to possess suitable habitat for the species.

2.3.5.7.2 Impacts

The project is not expected to impact juvenile river lamprey because of the lack of rearing habitat in the study area. Adult lamprey could use the project area at Suisun Creek for spawning because of gravel beds located in the area. The study area could also provide a migration corridor to upstream spawning areas if river lamprey use the creeks for spawning. Construction is expected to occur from June 1 to October 1, when lampreys would not be migrating upstream to spawn. Juvenile lampreys (ammocoetes) rear in backwater areas in the silt and sand. None of the creeks in the study area have backwater habitat in the immediate vicinity of the impact areas. Green Valley and Ledgewood Creeks have concrete lined channels and the creekbed of Suisun Creek is dominated by gravel in the construction area; consequently, suitable rearing habitat for ammocoetes (lamprey larvae) is not present in the immediately vicinity of the bridges. However, if ammocoetes were to occur in the study area in pockets of silt and sand, they could be disturbed by project construction. If disturbed, ammocoetes would be expected to move away from the study area and rebury themselves. Some gravel beds occurs at the Suisun Creek project site that could be used for spawning. STA will avoid the gravel beds, or if disturbed, will replace the gravel in its originallocation.

Cumulative Impacts

The proposed project would not result in cumulative impacts on river lamprey.

2.3.5.7.3 Avoidance, Minimization, and/or Mitigation Measures

Avoidance and minimization efforts described under section 2.3.6.5, Central California Coast Steelhead, would also benefit river lamprey.

Compensatory Mitigation

No compensatory mitigation for river lamprey is required.

2.3.5.8 Pacific Lamprey

Pacific lamprey (*Lampetra tridentata*) is found throughout Pacific coast streams, including streams within the Central Valley. The species is listed as a federal species of concern (U.S. Fish and Wildlife Service 2005). There is little information about its status. Pacific lamprey exhibits the same basic life history characteristics as river lamprey; however, adult Pacific lamprey migrate upstream in spring (early March to late June) in contrast to the fall and winter migration of adult river lamprey (Moyle 2002).

2.3.5.8.1 Existing Conditions

Pacific lamprey could occur in the study area, although their occurrence has not been documented. The study area is encompassed by the species' known distribution in California and all three creeks appear to possess suitable habitat for the species.

2.3.5.8.2 Impacts

Project impacts would be similar to those described under section 2.3.5.7, River Lamprey.

Cumulative Impacts

The proposed project would not result in cumulative impacts on Pacific lamprey.

2.3.5.8.3 Avoidance, Minimization, and/or Mitigation Measures

Avoidance and minimization efforts described under section 2.3.6.5, Central California Coast Steelhead, would also benefit Pacific lamprey.

Compensatory Mitigation

No compensatory mitigation is required for Pacific lamprey.

2.3.6 Threatened and Endangered Species

This section addresses species listed or eligible for listing as threatened or endangered. Table 2-11 in section 2.3.4.2 and Table 2-12 in section 2.3.5 list the threatened and endangered plant and animal species with potential to occur in the study area. Five threatened or endangered animal species have the potential to occur in the study area: Swainson's hawk, valley elderberry longhorn beetles, California red-legged frogs, central California coast steelhead, and Central Valley fall/late fall-run Chinook salmon. No threatened or endangered plant species occur in the study area, so they are not further addressed in this section.

2.3.6.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the federal Endangered Species Act (ESA): 16 United States Code (USC), Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent 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 FHWA, are required to consult with the USFWS and NOAA Fisheries to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of the federal ESA defines take as

"harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the CESA, California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The DFG 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 DFG. For projects requiring a Biological Opinion under Section 7 of the federal ESA, DFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

2.3.6.2 Swainson's Hawk

Swainson's hawk is state-listed as threatened by DFG, is a federal species of concern, and is protected under MBTA and CFGC 3503.5. MBTA and CFGC 3503.5 prohibit the "take" of migratory birds, nests, and young. In the Central Valley, this species typically nests in oak or cottonwood trees in or near riparian habitats; in oak groves; in roadside trees; and in lone trees. Swainson's hawks prefer nesting sites that provide sweeping views of nearby foraging grounds that consist of grasslands, irrigated pasture, alfalfa, hay, and row and grain crops. Swainson's hawks are migratory, wintering from Mexico to Argentina and breeding in California and elsewhere in the western United States. The raptor generally arrives in the Central Valley in mid-March and begins courtship and nest construction immediately after arrival at the breeding sites. The young fledge in early July, and most Swainson's hawks leave their breeding territories by late August or early September.

2.3.6.2.1 Existing Conditions

No Swainson's hawk nest sites are known from the study area or within an 8-kilometer (5-mile) radius around the study area (California Natural Diversity Database 2005). Large trees, suitable for nesting Swainson's hawk, are present along Green Valley, Suisun, and Ledgewood Creeks. However, it is unlikely that Swainson's hawks would nest in the study area because of the area's close proximity to I-80. Annual grasslands in the study area are located along I-80 and within developed portions of Fairfield. These areas are not typically used by Swainson's hawks for foraging. Higher-quality foraging habitat (open agricultural fields) occurs in the project vicinity.

2.3.6.2.2 Impacts

The proposed project would result in a permanent loss of approximately 0.001 hectare (0.002 acre) and temporary disturbance of 0.04 hectare (0.10 acre) of riparian woodland within and adjacent to the study area, which provides potential nesting habitat for Swainson's hawks. Although there is a low likelihood that Swainson's hawks would nest adjacent to I-80, tree removal or noise associated with construction activities could result in the disturbance of nesting Swainson's hawks if active nests are present within or near the construction area. These disturbances could cause nest abandonment and death of young or loss of reproductive potential

at active nests located in or near the study area. The proposed project could result in a substantial adverse effect, through loss of eggs or young, on a species listed as threatened under CESA.

Cumulative Impacts

The proposed project would result in the permanent loss of approximately 0.001 hectare (0.002 acre) and temporary disturbance of 0.04 hectare (0.10 acre) of riparian woodland that provides potential nesting habitat for Swainson's hawks. Because this habitat occurs along I-80 and is unlikely to be used by nesting Swainson's hawks the loss of habitat located along I-80 would not be cumulatively considerable and cumulative impacts to Swainson's hawk from the proposed project are not anticipated.

2.3.6.2.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance and minimization measures described under section 2.3.2.1, Riparian Woodland, and the following avoidance and minimization measure would avoid and minimize impacts on nesting Swainson's hawks.

Mitigation Measure BIO-10: Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary

To avoid and minimize impacts on nesting migratory birds, STA or its contractor will implement one or more of the following surveys and restrictions:

- Tree and shrub removal shall occur during the non-breeding season for most migratory birds and raptors (generally between August 16 and February 28).
- If construction activities, including tree and shrub removal, are scheduled to occur during the breeding season for migratory birds and raptors (generally between March 1 and August 15), STA will retain a qualified wildlife biologist (with knowledge of the species to be surveyed) to conduct nesting migratory bird and raptor surveys before the start of construction. The nesting surveys should be conducted within 1 week before initiation of construction activities (including tree removal) between March 1 and August 15. If no active nests are detected during these surveys, no additional mitigation is required.
- If surveys indicate that migratory bird or raptor nests are present in the survey area, a no-disturbance buffer will be established around the site to avoid disturbance or destruction of the nest site until after the breeding season or until after a qualified wildlife biologist determines that the young have fledged (usually late June to mid-July). The extent of these buffers will be determined by the biologist (in coordination with DFG) and will depend on the level of noise or construction disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. These factors will be analyzed to make an appropriate decision on buffer distances. Suitable buffer distances may vary between species

Compensatory Mitigation

No compensatory mitigation for Swainson's hawks is recommended.

2.3.6.3 Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle (VELB) is federally listed as a threatened species (45 FR 52803). This species was first described in 1921 from specimens collected in Sacramento (U.S.

Fish and Wildlife Service 1984). The species' range extends throughout the associated foothills of the Central Valley in California, from Kern County in the south to Shasta County in the north (Jones & Stokes Associates 1985, 1986, 1987).

VELB is closely associated with blue elderberry, an obligate host for beetle larvae. Blue elderberry is considered a typical riparian shrub (Roberts et al. 1977; Katibah et al. 1984; Warner 1984) in California. Though elderberry shrubs will grow in non-riparian habitats if there is a source of water, most VELB occurrences are known from elderberry shrubs in or adjacent to riparian communities.

2.3.6.3.1 Existing Conditions

A thorough search of Ledgewood and Green Valley Creeks in the construction work area and 30.5-meter (100-foot) radius around the construction work area did not identify any elderberry shrubs, the host plant for VELB. Four elderberry shrubs were identified along the east bank of Suisun Creek just south of the study area (Figure 2-6). All four shrubs are outside the construction work area, but within 30.5 meters (100 feet) of the proposed construction. The closest elderberry shrub #1 in Figure 2-6) occurs approximately 7.6 meters (25 feet) south of the construction work area. At the time of the January 27, 2006, field survey, much of the vegetation along the creek bank had been heavily disturbed or uprooted by recent flooding that occurred approximately 3 weeks earlier. Many of the stems of the elderberry shrubs were bent or broken, and one of the shrubs was lying horizontally. The number and size of stems present on each shrub and riparian habitat associations for each shrub are listed in Table 2-13.

Table 2-13. Summary of Stem Counts for Elderberry Shrubs adjacent to the Study Area

Shrub	Presence of Exit Holes?	Riparian Habitat?	Number of Stems (by Diameter)			Effect on Shrub (None, Direct, or Indirect)	Comments
			2.5–7.6 cm (1–3 in)	7.6–12.7 cm (3–5 in)	>12.7 cm (>5 in)		
1	No	Yes	8	1	2	Indirect	Approximately 7.6 meters 25 feet) south from proposed construction; Main stem is lying vertically on ground, old exit holes present
2	No	Yes	13	0	0	Indirect	Approximately 18.3 meters (60 feet) south from proposed construction; many (30+) smaller stems less than 2.5 centimeters (1 inch) in diameter
3	No	Yes	1	0	1	Indirect	Approximately 18.3 meters (60 feet) south from proposed construction; many (10+) smaller stems less than 2.5 centimeters (1 inch) in diameter
4	No	Yes	1	0	0	Indirect	Approximately 24.4 meters (80 feet) south from proposed construction; a few smaller stems less than 2.5 centimeters (1 inch) in diameter

2.3.6.3.2 Impacts

The proposed project will not directly affect (i.e., require removal or transplanting) VELB or its habitat. The four elderberry shrubs that occur along the east bank of Suisun Creek are located more than 6 meters (20 feet) from, but within 30.5 meters (100 feet) of proposed construction activities (grading, bridge construction, and staging) at Suisun Creek and could be indirectly affected by the proposed project. The closest elderberry shrub occurs approximately 7.6 meters (25 feet) from proposed construction. Possible indirect effects on VELB potentially occurring within 30.5 meters (100 feet) of the construction work area include increases in dust accumulation on shrubs from ground-disturbing activities and removal of associated woodland species. These impacts are discussed below:

- Ground-disturbing activities occurring within 30.5 meters (100 feet) of an elderberry shrub could cause an accumulation of dust on elderberry shrubs, altering VELB habitat. Excavation and grading in the vicinity of an elderberry shrub could damage the root system resulting in death of the shrub.

- Implementation of the proposed project would not change the hydrology of the existing habitat.
- Tree and shrub removal activities within the study area would be minimized and would involve only the removal of trees and shrubs necessary to construct the proposed project.

Cumulative Impacts

Cumulative impacts occur when two or more individual impacts, considered together, are considerable or compound or increase other environmental impacts.

In addition to the indirect effects on VELB habitat in the project vicinity, the project would contribute incrementally to Solano County cumulative impacts on VELB as a result of similar bridge modification projects, new bridge construction, and road widening projects, and from the loss of riparian habitat attributed to urban development. Additional projects proposed within the County, such as Fairfield Corporate Commons, Green Valley Corporate Park, and other business and residential projects in the area, have the potential to impact VELB habitat. No elderberry shrubs will be removed and mitigation measures identified below will ensure that indirect impacts on elderberry shrubs are minimized and compensated. Therefore, the project is not expected to contribute to cumulative impacts on VELB.

2.3.6.3.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the avoidance and minimization measures described under section 2.3.2.1, Riparian Woodland, and the following avoidance and minimization measure would minimize potential indirect effects on VELB and VELB habitat in the project vicinity.

Mitigation Measure BIO-11: Establish a Minimum 6.1-Meter-Wide (20-Foot-Wide) Buffer around All Elderberry Shrubs Where Feasible

Before any ground-disturbing activity, STA will ensure that a minimum 1.2-meter-tall (4-foot-tall) temporary, plastic mesh–type construction fence (Tensor Polygrid or equivalent) is installed at least 6.1 meters (20 feet) from the driplines of elderberry shrubs that will be retained adjacent to the study area (Shrubs # 1, 2, 3, and 4). This fencing is intended to prevent encroachment by construction vehicles and personnel. The exact location of the fencing shall be determined by a qualified biologist, with the goal of protecting habitat for VELB.

The fencing shall be strung tightly on posts set at a maximum interval of 3.0 meters (10 feet). The fencing shall be installed in a way that prevents equipment from enlarging the work area beyond the delineated work area. The fencing shall be checked and maintained weekly until all construction is completed. This buffer zone shall be marked by a sign stating, "This is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment."

No construction activity, including grading, shall be allowed until this condition is satisfied. No grading, clearing, storage of equipment or machinery, or other disturbance or activity may occur until a representative of the County has inspected and approved all temporary construction fencing. The fencing and a note reflecting this condition shall be shown on the construction plans.

Mitigation Measure BIO-12: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel

Before any work occurs in the study area, including grading, a qualified wildlife biologist shall conduct mandatory contractor/worker awareness training for construction personnel. The training shall be provided to all construction personnel to brief them on the need to avoid impacts on biological resources and the penalties for not complying with biological mitigation requirements. If new construction personnel are added to the project, the contractor's superintendent shall ensure that the personnel receive the mandatory training before starting work. An environmental awareness handout will be provided to each person that describes and illustrates sensitive resources (i.e., California red-legged frog, nesting birds and raptors, elderberry shrubs, and native trees) that will be avoided during project construction and identifies all relevant permit conditions.

Mitigation Measure BIO-13: Implement Dust Control Measures

The contractor will ensure that dust control measures are implemented for all ground-disturbing activities in the project area. These measures may include application of water to graded and disturbed areas that are unvegetated. To avoid attracting Argentine ants, at no time shall water be sprayed within the driplines of elderberry shrubs.

Compensatory Mitigation

Implementation of the following compensation measure would ensure that the proposed project fully mitigates indirect affects on VELB habitat in the project vicinity.

Mitigation Measure BIO-14: Compensate for Indirect Impacts on Valley Elderberry Longhorn Beetle Habitat

Indirect impacts to elderberry stems measuring 2.5 centimeters (1.0 inch) or more at ground level (i.e., VELB habitat) that are located more than 6 meters (20 feet) from but within 30.5 meters (100 feet) of construction activities (Shrubs #1, 2, 3, and 4) will be compensated. Compensation shall include replacement plantings of elderberry seedlings or cuttings and associated native plantings in a USFWS-approved conservation area, at a ratio between 1:1 and 8:1 (ratio = new plantings to affected stems), depending on the diameter of the stem at ground level, the presence or absence of exit holes, and whether the shrub is located in riparian habitat (Table 2-13). A total of four elderberry shrubs are growing within 30.5 meters (100 feet) of proposed construction activities (Table 2-13) and could be indirectly affected by the proposed project (Shrubs #1, 2, 3 and 4). The locations of these shrubs are depicted in Figure 2-6. Using the compensation ratios presented in Table 2-14 and information presented in Table 2-13, a total of 41 elderberry seedlings ([23 at 2:1 = 26] + [1 at 3:1 = 3] + [3 at 4:1 = 12]) would be required to compensate for indirect effects on VELB habitat within 30.5 meters (100 feet) of construction activities. The compensation ratio for associated native plantings is 1:1 for elderberry shrubs without exit holes, for a total of 41 associated native plantings (41 at 1:1 = 41). These compensation ratios reflect the fact that none of the shrubs located in the study area contains exit holes.

Table 2-14. USFWS-Approved Compensation Ratios for VELB Habitat

Location	Stems (Diameter in cm [in] at Ground Level)	Exit Holes?	Elderberry Seedling Ratio	Associated Native Plant Ratio*
Non-Riparian	2.5–7.6 (1–3)	No: Yes:	1:1 2:1	1:1 2:1
Non-Riparian	7.6–12.7 (3–5)	No: Yes:	2:1 4:1	1:1 2:1
Non-Riparian	>12.7 (>5)	No: Yes:	3:1 6:1	1:1 2:1
Riparian	2.5–7.6 (1–3)	No: Yes:	2:1 4:1	1:1 2:1
Riparian	7.6–12.7 (3–5)	No: Yes:	3:1 6:1	1:1 2:1
Riparian	>12.7 (>5)	No: Yes:	4:1 8:1	1:1 2:1

* Ratio of native trees/plants to each elderberry seedling.

To compensate for indirect impacts to VELB habitat, STA shall purchase VELB credits at a USFWS-approved mitigation bank. Currently, there are no mitigation banks for VELB within Solano County. Because compensation is being proposed only for indirect impacts and no elderberry shrubs will be removed (transplanted), STA proposes to purchase mitigation credits at the closest VELB mitigation bank located at Wildlands Inc.'s Sacramento River Ranch Valley Elderberry Beetle Conservation Bank in nearby Yolo County. The exact cost to establish a mitigation site for 41 elderberry seedlings and 41 associated native plantings at the approved mitigation site will be determined at the time of purchase. The final amount and final location of this mitigation will be determined through consultation between FHWA and the USFWS and outlined in the USFWS biological opinion.

2.3.6.4 California Red-Legged Frog

The California red-legged frog is listed as threatened under the federal ESA and is a California species of special concern. Historically, California red-legged frog was common from Redding to Baja California, including the Sierra Nevada and Coast Ranges. Its current range is much reduced, and most remaining populations are found in central California along the coast from Marin County to Ventura County.

California red-legged frogs breed in lowland and foothill streams and wetlands, including livestock ponds (Jennings and Hayes 1994). California red-legged frogs may also be found in upland habitats near breeding areas and along intermittent drainages connecting wetlands. Adults may take refuge during dry periods in rodent holes or leaf litter in riparian habitats. Although California red-legged frogs typically remain near streams or ponds, recent studies in Santa Cruz suggest that they are capable of moving 1.6 kilometers (1 mile) or more in upland habitat or through ephemeral drainages (Bulger 1999).

2.3.6.4.1 Existing Conditions

California red-legged frogs have not been previously documented within the study area or in the drainages associated with the study area (Green Valley, Ledgewood, and Suisun Creeks). Monk & Associates (2004) identified suitable aquatic habitat (a plunge pool) within Suisun Creek on

the north side of I-80 adjacent to the study area; however, no California frogs were identified in this area during protocol-level surveys. The closest sightings of red-legged frogs occur within a drainage just north of SR 12 in the Jameson Canyon area, approximately 1.2 miles west of Green Valley Creek in the study area (California Natural Diversity Database 2005; Monk & Associates 2004). One adult red-legged frog and seven larvae were observed in 2003 and 2004, respectively, at this location.

2.3.6.4.2 Impacts

No red-legged frogs were observed within or adjacent to the study area during the January and August 2006 reconnaissance-level surveys. No plunge pools or side channels that could provide potential breeding habitat for California red-legged frogs were observed in the study area. If California red-legged frogs occur within portions of Green Valley Creek, Suisun Creek, or Ledgewood Creek (upstream or downstream from the study area), there is potential for California red-legged frogs to move through the study area. Adjacent uplands within the study area occur in heavily disturbed areas along I-80 and do not provide suitable habitat for California red-legged frogs. A site assessment report was prepared for the proposed project and has been submitted to USFWS to determine if protocol-level surveys are necessary. Based on the known occurrence of California red-legged frog near the study area and the presence of suitable habitat in the study area, Caltrans prepared a BA to submit to USFWS. Site assessment data sheets are provided in the Biological Assessment (STA 2006g).

Bridge construction within Green Valley, Suisun, and Ledgewood Creeks would temporarily disturb 0.16 hectare (0.40 acre) of potential California red-legged frog aquatic dispersal habitat. Additionally, the proposed project would result in the loss of 0.001 hectare (0.002 acre) and temporary disturbance of 0.04 hectare (0.10 acre) of riparian habitat along the creek banks that provides potential foraging and refuge sites for California red-legged frog. This habitat occurs within a highly disturbed area along I-80. No loss of potential California red-legged frog breeding habitat will occur because no plunge pools or side channels were identified within the study area. A small side pool was observed within Green Valley Creek in the study area but is likely to provide only marginal breeding habitat since it occurs within the main channel and adjacent o the bridge where high velocity flows would be expected during large rain events. It is unlikely that construction activities will harm this species because it is not known to occur in Green Valley Creek, Suisun Creek, or Ledgewood Creek. However, because occupied habitat and suitable breeding habitat are in close proximity (1.6 kilometers [1 mile] west of Green Valley Creek), the potential for California red-legged frogs to occur in the study area during construction cannot be discounted.

California red-legged frogs could be directly affected by construction activities occurring within or adjacent to Green Valley, Suisun, or Ledgewood Creeks. If California red-legged frogs are present within the construction work area hey could be inadvertently killed or wounded by construction vehicles, construction personnel, and accidental spill of toxic fluids (i.e., gasoline and other petroleum-based products). If California red-legged frogs must be captured and relocated outside the construction work area, they could be exposed to increased risks or disease, predation, and competition that could result in increased mortality.

Construction activities associated with bridge widening within Green Valley, Suisun, and Ledgewood Creeks would temporarily disturb a total of 0.16 hectares (0.40 acre) of suitable

California red-legged frog habitat. Additionally, he proposed project would result in the permanent loss of 0.001 hectare (0.002 acre) and temporary disturbance of 0.04 hectare (0.10 acre) of riparian habitat along the creek band that provides potential foraging and refuge sites for California red-legged frogs.

Construction activities associated with bridge widening within Green Valley, Suisun, and Ledgewood Creeks could result in indirect effects on water quality downstream from the construction work area. Increased sedimentation could reduce the suitability of California red-legged frog habitat downstream of the construction area by filling in pools and smothering eggs. Accidental spills of toxic fluids could also result in the subsequent mortality of California red-legged frogs if these substances flow downstream from the construction area and California red-legged frogs are present. Implementation of the avoidance and minimization efforts identified above for California red-legged frog and construction BMPs, along with compensatory mitigation below, would reduce indirect affects on California red-legged frogs and potential habitat that could occur downstream from the construction work area.

Cumulative Impacts

Cumulative impacts occur when two or more individual impacts, considered together, are considerable or compound or increase other environmental impacts.

In addition to the direct effects on California red-legged frog and its habitat in the project vicinity, the project would contribute incrementally to Solano County cumulative impacts on California red-legged frog as a result of similar bridge modification projects, new bridge construction, and road widening projects, and from the loss of riparian habitat attributed to urban development. Additional projects proposed within the County, such as Fairfield Corporate Commons, Green Valley Corporate Park, and other business and residential projects in the area, have the potential to have cumulative effects on California red-legged frog and its habitat through the loss of aquatic and riparian habitat.

California red-legged frogs will be avoided during project construction, and the proposed project will remove only a very small amount (0.001 hectare [0.002 acre]) of potential California red-legged frog habitat within a highly disturbed area along I-80. All other impacts are temporary. Therefore, the project is not expected to contribute to cumulative impacts on California red-legged frogs.

2.3.6.4.3 Avoidance, Minimization, and/or Mitigation Measures

In addition to minimization measures identified above under 2.3.2.1, Riparian Woodland, and 2.3.2.3, Drainages, implementation of the following USFWS standardized avoidance and minimization measures would ensure that effects to California red-legged frogs are minimized during construction activities associated with widening the bridges at Green Valley, Ledgewood, and Suisun Creeks in the study area.

Mitigation Measure BIO-15: Avoid and Minimize Temporary Impacts on Potential California Red-Legged Frog Aquatic Habitat

The following measures will be implemented before and during construction activities occurring within or near potential California red-legged frog habitat to minimize both direct and indirect effects on California red-legged frogs:

- A qualified biologist approved by USFWS will train all project staff regarding habitat sensitivity, identification of California red-legged frogs, and required practices before the start of construction. The training shall include the general measures that are being implemented to conserve the species as they relate to the project, penalties for non-compliance, and boundaries of the study area. A fact sheet or other supporting materials containing this information will be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures. Training shall be conducted in languages other than English as appropriate.
- A pre-construction survey shall be conducted immediately preceding a construction activity that occurs in California red-legged frog habitat or an activity that may result in take of the species. The USFWS-approved biologist shall carefully search all obvious potential hiding spots for California red-legged frogs, such as large downed woody debris, the perimeter of pond or wetland habitats, and the riparian corridors associated with streams and drainages. Any California red-legged frogs found shall be captured and held for the minimum amount of time necessary to release them in suitable habitat outside the study area. Suitable release sites shall be approved by a qualified biologist approved by the USFWS before the start of construction activities.
- The USFWS-approved biologist will monitor all ground-disturbing construction activity near potential California red-legged frog habitat. After ground-disturbing activities are complete, the USFWS-approved biologist will train an individual to act as the on-site construction monitor. The on-site monitor will have attended the training described above. Both the USFWS-approved biologist and construction monitor will have the authority to stop or redirect project activities to ensure protection of resources and compliance with all environmental permits and conditions of the project. If the USFWS-approved biologist or construction monitor has requested that work stop because of take of any of the listed species, USFWS and DFG will be notified within 1 working day via email or telephone. The USFWS-approved biologist and construction monitor will complete a daily log summarizing activities and environmental compliance.
- If a California red-legged frog is encountered during construction work, activities will cease until the frog is removed and relocated by a USFWS-approved biologist.
- Any person capturing or handling California red-legged frogs shall be a qualified biologist approved by USFWS. A qualified biologist means any person who has completed at least 4 years of university training in wildlife biology or a related science, or has demonstrated field experience in the identification and life history of the California red-legged frog. Resumes of all biologists proposed to capture or handle California red-legged frogs shall be submitted to USFWS for approval no later than 30 days before the start of construction.
- If necessary, nets or bare hands may be used to capture red-legged frogs. The USFWS-approved biologist will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within 2 hours before and during periods in which they are capturing and relocating California red-legged frogs. To avoid transferring disease or pathogens between aquatic habitats during the course of surveys or handling of California red-legged frogs, the USFWS-approved biologist will follow the Declining Amphibian Populations Task Force's Code of Practice. The USFWS-approved biologist will limit the duration of handling and

captivity of California red-legged frogs. While in captivity, California red-legged frogs shall be kept in a cool, moist, aerated environment, such as a bucket containing a damp sponge. Containers used for holding or transporting adults of this species shall not contain any standing water.

- All construction areas will be flagged, and all activity will be confined to these areas.
- Because dusk and dawn are often the times when California red-legged frogs are most actively foraging and dispersing, all construction activities should cease 30 minutes before sunset and should not begin before 30 minutes prior to sunrise.
- A representative shall be appointed by the applicant who will be the contact source for any employee or contractor who might inadvertently kill or injure a California red-legged frog or who finds a dead, injured, or entrapped individual. The representative shall be identified during the employee education program. The representative's name and telephone number shall be provided to the USFWS before the initiation of ground-disturbing activities.
- Tightly woven fiber netting or similar material shall be used for erosion control or other purposes at the project site to ensure that California red-legged frogs are not trapped. This limitation will be communicated to the contractor through use of special provisions included in the bid solicitation package. Coconut coir matting is an acceptable erosion control material. No plastic monofilament matting shall be used for erosion control.
- A litter control program shall be instituted at the entire project site. All workers will ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the study area are deposited in covered or closed trash containers. The trash containers shall be removed from the study area at the end of each working day.
- After construction activities are complete, temporarily disturbed areas will be restored to pre-project conditions and additional areas within and adjacent to the study area would be enhanced by removing nonnative riparian vegetation (i.e., giant reed, bigleaf periwinkle, and Himalayan blackberry) and replacing it with native riparian plants including, willow, alder, mugwort, and California wild rose.
- The construction contract will specify the avoidance and minimization measures described above for bid information when applicable. In addition, the applicant will educate and inform contractors involved in the project about the requirements of applicable permits obtained for the project, including a biological opinion.

Compensatory Mitigation

Implementation of the following compensation measure would ensure that the proposed project fully mitigates for permanent and temporary impacts on California red-legged frog habitat in the study area.

Mitigation Measure BIO-16: Compensate for the Loss and Disturbance of California Red-Legged Frog Habitat. Currently, there are no mitigation banks for California red-legged frog within Solano County. The closest mitigation bank is located in Alameda County (Ohlone Conservation Bank). The Solano County Water Agency's Habitat Conservation Plan (in preparation), which covers Solano County, will identify specific areas (e.g., the Tri-City Planning Area managed by the Solano Land Trust) where mitigation efforts for California red-

legged frog should be directed (Okita pers. comm.). At this time, there is no mechanism for contributing funds to this conservation site.

To compensate for the permanent loss of 0.001 hectare (0.002 acre) and temporary disturbance of 0.04 hectare (0.10 acre) of riparian habitat for California red-legged frog along Green Valley Creek, Ledgewood Creek, and Suisun Creek in the study area, STA shall enhance an area of Suisun Creek approximately 50 feet upstream and downstream from the study area by removing nonnnative species (i.e., giant reed, bigleaf periwinkle, Himalayan blackberry) and replacing them with native riparian plants including, willow, alder, mugwort, and California wild rose. Additional enhancement opportunities are not feasible along Ledgwood Creek and Green Valley Creek because these areas either support existing native species or are maintained for flood control by the Solano County Water Agency (Okita pers. comm.) and support sparse vegetation.

2.3.6.5 Central California Coast Steelhead

Central California coast steelhead (*Oncorhynchus mykiss*) was listed as threatened by NOAA Fisheries on August 18, 1997 (62 FR 43938). There is no state status. Central California coast steelhead includes populations from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River. Although streams within the study area are known to contain steelhead, these streams are not designated as critical habitat for steelhead by NOAA Fisheries (70 FR 52488).

2.3.6.5.1 Existing Conditions

Various surveys conducted by DFG and Leidy et al. (2005) indicate that steelhead have been found historically and are currently present in the Suisun Creek watershed. A few steelhead (one adult and two juveniles) were collected by Leidy et al. (2005) in Green Valley Creek approximately 1 and 2 miles upstream of the project site. In Suisun Creek, adult and juvenile steelhead were found above the study area near the confluence with Wooden Valley Creek (Hanson Environmental 2002). Ledgewood Creek connects to Suisun Slough downstream from the project site, and steelhead are able to ascend the creek. The Suisun Creek watershed, near Lake Curry, provides suitable habitat for steelhead spawning and juvenile rearing when there is moderate to high rainfall. During dry years, adults would not be able to migrate upstream to suitable spawning habitat and juveniles would not have appropriate water temperatures to rear through summer (Hanson Environmental 2002). In Suisun Creek, there is a potential spawning habitat under the I-80 bridge. Green Valley and Ledgewood Creeks at the I-80 crossings are concrete lined and do not provide spawning habitat, although accumulated sediments in the concrete-lined portion of Green Valley Creek may provide potential spawning habitat but these gravels would be subject to scour during storm events as a result of high water velocities under the bridge. Currently, the concrete-lined portions of the Green Valley and Ledgewood Creeks in the study area contain constructed fishways to facilitate fish passage under the respective bridges while the creek bed in Suisun Creek under I-80 is natural bottom.

2.3.6.5.2 Impacts

The proposed project could have impacts on habitat structure and habitat conditions for steelhead. Steelhead in the study area are listed as threatened under the federal ESA, and incidental take of juveniles could occur if the proposed project is implemented.

Avoidance and minimization measures described above would ensure that implementation of the proposed project will not adversely affect the continued existence and recovery of central California coast steelhead.

Effects on Water Quality

Assessment of water quality impacts (Section 2.2.2) addresses the effects of sediment and contaminants on steelhead and their habitat. Contaminants include toxic substances, such as metals, petroleum products, pesticides, fertilizers, sewage, and uncharacteristically high sediment loading. Activities associated with bridge widening, highway improvements, and revegetation could increase erosion processes, thereby increasing sedimentation and turbidity in downstream waterways. Excessive sediment deposited in or near stream channels can degrade aquatic habitats. Increased turbidity can increase fish mortality; reduce feeding opportunities for fish, including rearing steelhead; and cause fish to avoid important habitat.

Additionally, construction materials, such as concrete, sealants, oil, and paint could adversely affect water quality if accidental spills occurred during project construction. Increased pollutant concentrations could limit fish production, abundance, and distribution by direct mortality of fish or their prey. Steelhead inhabiting the study area require relatively clean, cold, well-oxygenated water for successful growth, reproduction, and survival and are not well adapted for survival in degraded aquatic habitats.

This impact can be minimized by implementing Mitigation Measure BIO-17: Prevent Contaminants and Hazardous Materials from Entering Streambed, described below.

Effects on Fish Habitat and Channel Morphology

Construction activities associated with the proposed project that would affect fish habitat include stream dewatering and placement of new bridge piers and abutments and revegetation. Bridge widening and bank stabilization activities would require removal of vegetation, resulting in temporary loss of vegetative cover, potentially reducing shade and fish habitat complexity. Construction activities could also change the channel morphology by disturbing the streambed substrate with heavy equipment.

Streamside vegetation, including shaded riverine aquatic (SRA) cover, is an essential component of salmonid habitat. Undercut banks and overhead SRA cover, such as canopy cover and overhanging vegetation, provides fish with protection from predators, maintains shade necessary to reduce thermal input, and provides nutrients to the stream in the form of fallen leaves and insects. Riparian vegetation is also important in controlling streambank erosion, contributing to in-stream structural diversity, and maintaining undercut banks. Elements of the proposed project would remove vegetation and SRA cover. However, the amount of vegetation removal is relatively minor, and other project elements would mitigate any adverse effects. This impact can be minimized by implementing the Mitigation Measure BIO-21: Minimize Impacts on Creek Channel, described below.

Water Temperature Effects

Under existing conditions, habitat in the study area for juvenile steelhead rearing is likely marginal to unsuitable during summer (Hanson Environmental 2002). Water temperature is an important variable that determines the suitability of fish habitat for fish growth, reproduction,

survival, and migration. This is especially true for steelhead, which have relatively narrow temperature requirements for carrying out their life history. Any increase in water temperatures could further reduce the suitability of habitat in the study area for steelhead.

Water temperature is controlled primarily by flow, weather, stream width and depth, and shading of the stream surface. The proposed project would affect shade provided by riparian vegetation.

Based on a site evaluation conducted during the field visit, the proposed project would affect a relatively minor amount of vegetation that shades the water (SRA cover) and would not affect on the geometry of the existing low-flow channel, thereby avoiding effects on the residence time and depth of water, or the area of water exposed to solar radiation. From the perspective of water temperature, the reduction in stream shading from removal of SRA cover vegetation would not result in any measurable change in water temperature. Furthermore, the loss of shade would be offset by the increased shading provided by the bridge widening and, over time, by the replacement and re-establishment of riparian vegetation in the affected area. Implementation of the proposed project is not expected to affect creek shading and water temperature, therefore no water temperature effects would occur.

Effects on Fish Movement

Construction activities associated with the proposed project would require temporary redirection of the flow of water through the use of cofferdams and a pipeline. These devices could block the migration of juvenile steelhead. The implementation of Mitigation Measure BIO-20: Provide Alternate Migration Corridor through Creek Channel, would ensure the temporary stream diversions associated with construction would not likely adversely affect juvenile steelhead.

The additional bridge piers at Green Valley, Suisun, and Ledgewood Creeks crossing over the study area would not affect fish passage or movement because they would be placed in the flood flow channel and not the low flow channel, through which the fish pass.

Effects on Potential Spawning Habitat

Potential spawning habitat exists in Suisun Creek beneath the I-80 bridge However, construction activities would not affect the existing gravel patch under the bridge because all construction equipment will access the construction site from the existing bridge and road. The implementation of Mitigation Measure BIO-19: Avoid Potential Fish Spawning Habitat, will further ensure that impacts on spawning habitat are avoided.

Disturbance and Direct Injury

Noise, vibrations, artificial light, and other physical disturbances can harass fish, disrupt or delay normal activities, or cause injury or mortality. The potential magnitude of effects depends on a number of factors, including the type and intensity of the disturbance, proximity of the action to the water body, timing of actions relative to the occurrence of sensitive life stages, and frequency and duration of activities. For most activities, the effects on fish will be limited to avoidance behavior in response to movements, noises, and shadows caused by construction personnel and equipment operating in or adjacent to the water body. However, survival may be altered if disturbance causes fish to leave protective habitat (e.g., increased exposure to predators) or is of sufficient duration and magnitude to affect growth and spawning success. Injury or mortality

may result from direct and indirect contact with humans and machinery, sound pressure (blasting and pile driving), and physiological stress.

Physical disturbance and injury is most likely to occur during in-water work. Project actions that involve in-water work include removing and disturbing aquatic vegetation, removing sediment and debris from the stream channel, and driving concrete pilings. Project actions that cause no direct harm but may temporarily disturb fish include movement of construction equipment and personnel, lighting, removal and disturbance of riparian vegetation, and grading and construction of access roads and staging areas adjacent to the stream.

Potential direct effects of pile driving activities include increased noise and turbidity. Researchers have suggested that salmonids can hear pile-driving noise approximately 610 meters (2,000 feet) from the source, and have further concluded that pile driving altered the distribution and behavior of juvenile pink and chum salmon (Feist et al. 1992). The potential impact on salmonids from pile driving activities depends on the distance and duration of pile-driving activities.

Short-term noise disturbance caused by pile driving will occur during construction. Evidence suggests that although pile-driving noise may affect distribution and behavior of juvenile pink and chum salmon, no significant changes occurred in their overall abundance (Feist et al. 1992). Pile driving and blasting can generate intense sound pressure that can injure or kill fish. The effects on fish can range from avoidance to direct mortality depending on the species, life stage, and intensity of the pressure waves. Factors that influence the intensity of pressure waves include the proximity to the source, maximum force generated and rate at which it is generated, and characteristics of the medium (e.g., water and substrate) through which the waves travel. Pile driving effects will be minimized by Mitigation Measure BIO-22: Minimize Noise Impacts on Special-Status Fish Species (see below). Therefore, pile-driving activities will not adversely affect steelhead.

Cumulative Impacts

The proposed project would not result in cumulative impacts on central California coast steelhead.

2.3.6.5.3 Avoidance, Minimization, and/or Mitigation Measures

STA will implement the following avoidance and minimization measures for sensitive fish species potentially occurring in Green Valley, Suisun, and Ledgewood Creeks.

Mitigation Measure BIO-17: Prevent Contaminants and Hazardous Materials from Entering the Stream Channel

The contractor will implement a SWPPP as part of the NPDES and a General Construction Activity Storm Water Permit to minimize the potential for sediment input to the aquatic system, including chinook salmon and steelhead spawning and rearing habitats. The contractors will also develop and implement a toxic materials control and spill response plan to regulate the use of hazardous materials, such as the petroleum-based products used as fuel and lubricants for equipment and other potentially toxic materials associated with project construction. In addition to the measures outlined above, the following measures will be implemented:

- Falsework will be installed to keep bridge debris and construction and maintenance materials from falling into streams during demolition, construction, and substantial maintenance activities.
- When concrete is poured to construct bridge footings or other infrastructure in areas of flowing water, work must be conducted to prevent contact of wet concrete with water (e.g., within a cofferdam).

Mitigation Measure BIO-18: Restrict Timing of In-Water Work to Avoid Special-Status Fish Spawning Seasons
In-channel construction, including riverbank and channel bed construction below the OHWM, will be limited to the summer low-precipitation period (June 1 to October 1) to reduce the likelihood of adverse effects on rearing juvenile steelhead, adult fish migration and spawning, and smolt emigration, unless otherwise approved by appropriate resource agencies.

Mitigation Measure BIO-19: Avoid Potential Fish Spawning Habitat
In-water construction activities will avoid disturbance of the spawning gravel bed under the I-80 bridge on Suisun Creek. If the gravel cannot be avoided, the gravel will be removed temporarily and replaced to the pre-construction conditions and using, to the extent practicable, gravel removed from the site.

Mitigation Measure BIO-20: Provide Alternate Migration Corridor through Creek Channel
In-water construction activities will provide a migratory route through the creek channel by installing cofferdams in all creeks around the new footing excavations. A pipeline will also be installed at Green Valley Creek.

The pipeline in Green Valley Creek will be a corrugated steel pipe, approximately 24–36 inches in diameter, which will allow for the passage of various sizes of fish. The pipe will span the width of the bridge plus ten feet on either side (i.e., upstream and downstream of the bridge). The pipeline will be installed at grade and will convey the entire creek flow to maintain a live stream downstream of the construction area. The pipeline will be removed as soon as possible after construction. Disturbance to the channel bed is not anticipated because the channel in the project area is concrete-lined. Subject to the sufficiency of ambient conditions, adequate fish passage conditions would be sustained by maintaining contiguous flows, avoiding the creation of vertical drops in excess of 6 inches, and maintaining suitable water velocities (i.e., 8 feet per second or less) and water depths of at least 1 foot). The pipe will be examined twice each day at a minimum (i.e., once in the morning and once in the evening), depending on debris load, to clear any debris buildup that may occur during construction. More frequent checks and debris removal will occur as conditions warrant.

Cofferdams shall affect no more of the stream channel than is necessary to support completion of the construction activity. Flow will be diverted the minimum distance necessary to isolate construction area. Water shall be released downstream at an appropriate rate to maintain downstream flows at all times.

STA will ensure that a fish biologist is on site to implement a fish rescue operation in isolated pools or other isolated channel areas that may harbor stranded fish. Exclusion and rescue protocols outlined by DFG and NOAA Fisheries will be implemented. Fish shall be removed from isolated pools by seining or electroshocking. At least one person on the fish rescue team will have a 4-year college degree in fisheries or biology, or related degree. The person must also have at least 2 years of professional experience in fisheries field surveys and the use of electroshocking equipment. Captured fish will be identified and counted. All fish will be released downstream of the project area. If any listed fish such as steelhead are recovered, NOAA Fisheries and DFG will be notified immediately and construction activities will cease until the agencies and STA have decided on appropriate actions.

Mitigation Measure BIO-21: Minimize Impacts on the Creek Channel
The following measures will be implemented to decrease impacts on the creek channel and habitat. See also the avoidance and minimization measures in section 2.3.2.3, Drainages.

- All HOV lane extension work will be performed from the road or median where practicable.
- The duration and extent of in-water activities will be limited to the maximum extent practicable.
- The minimum amount of wood, sediment, gravel, and other natural debris necessary will be removed to maintain and protect bridge function, ensure suitable fish passage conditions, and minimize disturbance of the streambed.
- Immediately upon completion of in-channel work, temporary fills (as needed), cofferdams, and other in-channel structures will be removed in a manner that minimizes disturbance to downstream flows and water quality.
- Streamflow through the widened portion of the bridges must meet the velocity, depth, and other passage criteria for salmonids as described by NOAA Fisheries and DFG, or as developed in cooperation with NOAA Fisheries and DFG to accommodate site-specific conditions.
- All creek channels will be returned to pre-project conditions.

Mitigation Measure BIO-22: Minimize Noise Impacts on Special-Status Fish Species
Potential injury and mortality associated with pile driving will be avoided or minimized by implementing the following measures:

- In-channel construction, including riverbank and channel bed construction below the OHWM, would be limited to the summer low precipitation period (June 1 to October 1) to reduce the likelihood of adverse effects on rearing juvenile steelhead and on adult fish spawning and migration.
- In-channel construction will be limited to the summer low flow period (June 1 to October 1), which decreases the distance the sound waves travel.
- Vibratory hammers will be used whenever feasible.
- The smallest pile driver and minimum force necessary will be used to complete the work.

During in-channel construction activities, some harassment or delay of migrating adults or juveniles may occur as a result of noise, artificial light, and other disturbances. These disturbances are not expected to be of sufficient extent, duration, or intensity to impact survival, growth, or spawning success.

Compensatory Mitigation

Mitigation Measure BIO-4, described above in section 2.3.2.1, Riparian Woodland, would compensate for the loss of riparian habitat in the study area. No further mitigation is recommended.

2.3.6.6 Central Valley Fall/Late Fall–Run Chinook Salmon

On March 9, 1998 (63 FR 11481), NOAA Fisheries issued a proposed rule to list fall-run Chinook salmon (*O. tshawytscha*) as threatened, but determined that the species did not warrant listing and identified it as a candidate species (64 FR 50393). On April 15, 2004, NOAA Fisheries downgraded the status of fall-run Chinook salmon to a species of concern (69 FR 19975).

Adult fall-run Chinook salmon migrate into freshwater from September through December. Fall-run Chinook salmon arrive at their spawning grounds in mature condition and spawn soon after. Fall-run Chinook salmon spawn from early October through late December, and incubation takes place from October through March. The peak of spawning is in October and November as water temperature drops. Juvenile Chinook salmon emerge from the gravel and migrate downstream to the ocean soon after emerging, rearing in the streams for only a few months before emigrating to the ocean.

2.3.6.6.1 Existing Conditions

Chinook salmon are known to occur in, and upstream of, the study area (NOAA Fisheries 2006). On Green Valley Creek, Chinook salmon redds (i.e., nests) have been observed upstream of I-80 near Mankas Crossing. In Suisun Creek, Chinook salmon have been observed as far upstream as the Napa County/Sonoma County line (approximately 20 miles upstream of I-80). Chinook salmon have also been observed in Ledgewood Creek upstream I-80 (NOAA Fisheries 2006). In Suisun Creek, there is potential spawning habitat under the I-80 bridge. No suitable spawning habitat occurs in the concrete-lined portion of Green Valley and Ledgewood Creeks at the I-80 crossings and existing fishways consisting of a low-flow channel with flow deflectors facilitates fish passage through the study area on these creeks.

2.3.6.6.2 Impacts

Impacts on Central Valley fall/late fall–run Chinook salmon are similar to those described under section 2.3.6.5, Central California Coast Steelhead.

Cumulative Impacts

The proposed project would not result in cumulative impacts on Chinook salmon.

2.3.6.6.3 Avoidance, Minimization, and/or Mitigation Measures

The avoidance and minimization efforts described under section 2.3.6.5, Central California Coast Steelhead, would also benefit Central Valley fall/late fall–run Chinook salmon.

Compensatory Mitigation

Mitigation Measure BIO-4, described under section 2.3.2.1, Riparian Woodland, would compensate for the loss of riparian habitat in the study area. No further mitigation is recommended.

2.3.7 Invasive Species

Invasive species are plant species designated as federal noxious weeds by U.S. Department of Agriculture (USDA), species listed by the California Department of Agriculture (CDFA), and invasive plants identified by the California Invasive Plant Council (Cal-IPC). Roads, highways, and related construction projects are some of the principal dispersal vectors for invasive species. The introduction and spread of invasive plants adversely affect natural plant communities by displacing native plant species that provide shelter and forage for wildlife species.

2.3.7.1 Regulatory Setting

On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." FHWA guidance issued August 10, 1999, directs the use of the state's noxious weed list (California Department of Food and Agriculture 2004) to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project. Accordingly, the CDFA and Cal-IPC lists were used for the analysis of invasive species in the study area.

2.3.7.2 Existing Conditions

Table 2-15 identifies the invasive species from the CDFA and Cal-IPC lists found in the study area. The infestation of the study area by these species is limited. Except for infestations of Bermuda grass and Harding grass in the seasonal wetland adjacent to Green Valley Creek and bigleaf periwinkle in the riparian woodland on the west bank of Suisun Creek, infestations occur primarily on isolated patches of ruderal vegetation on the edges of roadways or scattered in the annual grassland.

Table 2-15. Invasive Plant Species Located in the Study Area

Species	CDFA	Cal-IPC
Slender wild oat (*Avena barbata*)	–	Moderate
Wild oat (*Avena fatua*)	–	Moderate
Black mustard (*Brassica nigra*)	–	Moderate
Soft chess (*Bromus hordeaceus*)	–	Limited
Italian thistle (*Carduus pycnocephalus*)	C	Moderate
Yellow star-thistle (*Centaurea solstitialis*)	C	High
Poison hemlock (*Conium maculatum*)	–	Moderate
Bermuda grass (*Cynodon dactylon*)	C	Moderate
Longbeak stork's bill (*Erodium botrys*)	–	Limited
Blue gum (*Eucalyptus globulus*)	–	Moderate
Fennel (*Foeniculum vulgare*)	–	High
Annual cranesbill (*Geranium molle*)	–	Moderate
Italian ryegrass (*Lolium multiflorum*)	–	High
Harding grass (*Phalaris aquatica)*	–	Moderate
Bristly ox-tongue (*Picris echioides*)	–	Limited
Smilo grass (*Piptatherum millaceum*)	–	Limited
Wild radish (*Raphanus sativus*)	–	Limited
Himalayan blackberry (*Rubus discolor*)	–	High
Curly dock (*Rumex crispus*)	–	Limited
Milk thistle (*Silybum marinum*)	–	Limited
Medusahead (*Taeniatherum caput-medusae*)	C	High
Bigleaf Periwinkle (*Vinca major*)	–	Moderate

Notes: The CDFA and Cal-IPC lists assign ratings that reflect the CDFA and CalIPC views of the statewide importance of the pest, likelihood that eradication or control efforts would be successful, and present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest under general circumstances.

The CDFA categories indicated in the table are defined as follows:

- **C:** State-endorsed holding action and eradication only when found in a nursery; action to retard spread outside nurseries at the discretion of the commissioner.

The Cal-IPC categories indicated in the table are defined as follows:

- **High:** Species with severe ecological impacts, high rates of dispersal and establishment, and usually widely distributed.
- **Moderate:** Species with substantial and apparent ecological impacts, moderate to high rates of dispersal, establishment dependent on disturbance, and limited to widespread distribution.
- **Limited:** Species with minor ecological impacts, low to moderate rates of invasion, limited distribution, and locally persistent and problematic.

2.3.7.3 Impacts

Invasive weed species in the study area are present along roadsides, which are routinely disturbed by shoulder maintenance and vegetation management activities. The proposed project would create additional disturbed area for a temporary period, but it would not substantially increase the area subject to repeated disturbance because the new road shoulders would replace existing road shoulders. Therefore, the proposed project is not anticipated to either increase or decrease the area currently occupied by invasive weeds or the potential for spreading invasive weed species. Implementation of the avoidance and minimization measures described above would avoid potential impacts of invasive plants. No further mitigation is proposed.

Cumulative Impacts

Cumulative impacts caused by the spread of invasive weed species would result from construction of general development projects in Solano County. Construction of the proposed project would not be expected to add to the cumulative spread of invasive weeds. Additionally, with implementation of the mitigation measures prescribed for minimizing impacts, the proposed project would avoid cumulatively adverse impacts related to the spread of invasive weed species.

2.3.7.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following measure would avoid and minimize the introduction and spread of invasive plants during construction.

Mitigation Measure BIO-23: Avoid the Introduction and Spread of Invasive Plants

The construction contractor shall be responsible for avoiding the introduction of new invasive plants and the spread of invasive plants previously documented in the study area. Accordingly, the following measures shall be implemented during construction:

- Construction supervisors and managers will be educated about invasive plant identification and the importance of controlling and preventing the spread of invasive plant infestations.
- Surface disturbance within the construction work area will be minimized to the greatest extent possible.
- All disturbed areas will be seeded with certified weed-free native mixes and mulched with certified weed-free mulch (rice straw may be used in upland areas).
- Native, non-invasive species will be used in erosion control plantings to stabilize site conditions and prevent invasive species from colonizing.

2.3.8 Compliance with Conservation Plans and/or Local Policies

There are several policies (identified below) in the Fairfield General Plan and the Fairfield City Code pertaining to biological resources, including special status plant and animal species, wetlands and drainages, trees, and riparian habitat.

2.3.8.1 Regulatory Setting

City of Fairfield General Plan-Open Space Element

Policy OS 7.7: Promote the preservation of existing mature trees and encourage the replanting of appropriate shade trees in new developments.

Policy OS 9.1: Promote restoration and establish permanent mechanisms to protect wetlands and riparian corridors.

Fairfield City Code Section 21.2. Pruning, destroying, etc., trees

This section of the City Code states that no person not the owner of a tree shall injure, prune, disfigure, or destroy any tree within the city, whether situated on private land or on any public property or easement without written consent by the owner. (Ord. No. 12 (1953), section 2.)

Fairfield City Code, Chapter 25, Article VIII: Creekside Protection Plan

The purpose of this plan is to maintain, restore, protect, and enhance stream and riparian zoned in a manner compatible with the character of the adjoining property. This plan applies to Ledgewood, Green Valley, and Suisun Creeks, but excludes the construction of bridges. Therefore, it is not necessary for this project to comply with Fairfield's Creekside Protection Plan.

Solano County Habitat Conservation Plan

The Solano County Water Agency (SCWA) and the Bureau of Reclamation, along with the eight Member Agencies that receive delivery of Solano Project water (City of Vacaville, City of Fairfield, Suisun City, City of Vallejo, Solano Irrigation District (SID), Maine Prairie Water District (MPWD), University of California, Davis, and California Medical Facility/California State Prison, Vacaville) have agreed to implement conservation measures to ensure the protection of threatened and endangered species and their habitat within the SCWA contract service area. They have developed a habitat conservation plan (HCP) for this area. The Solano County HCP is intended to support the issuance of a Section 10(a)1(B) "incidental take permit" under the federal ESA for activities associated with future water use in the Solano Project contract service area.

2.3.8.2 Impacts

STA is not a participant in the Solano County HCP, and the project will not result in any rezoning, the conversion of open space to another use, or a take of any species. Therefore, there is no conflict with the Solano County HCP.

There are several policies in the Fairfield General Plan pertaining to biological resources, including special-status plant and animal species, wetlands and drainages, trees, and riparian habitat. With avoidance, minimization, and mitigation measures for biological resources in place, the project will not conflict with any policies outlines in the Fairfield General Plan or any city or county ordinances.

2.3.8.3 Avoidance, Minimization, and/or Mitigation Measures

Implementation of avoidance, minimization and mitigation measures indicated above for individual species and riparian woodland habitat will ensure compliance with local policies and ordinances, and with the Solano County HCP.

2.4 Mandatory Findings of Significance

As identified and described throughout this initial study, the environmental impacts associated with the proposed project range from "no impact" to "less than significant with mitigation incorporated." Resources and resource issues that were identified as incurring potentially significant impacts are: biological resources; hazardous waste and materials; noise; transportation and traffic; and utilities and emergency services. Mitigation measures have been identified to avoid, minimize, rectify, reduce, eliminate, or compensate for all impacts identified as potentially significant, thereby reducing such impacts *to less-than-significant* levels. These mitigation measures are identified in each section of the initial study where potentially significant impacts are discussed.

Adverse effects on human beings as a result of the operation of the proposed project are minimal. Potential for adverse effects on human beings would be limited to the construction phase of the project, but would be insubstantial and are therefore considered *less than significant*. Implementation of the prescribed mitigation measures would reduce all potentially significant impacts to *less-than-significant* levels.

Interstate 80 (I-80) is an important arterial roadway connecting the San Francisco Bay Area, Sacramento, the Sierra Nevada Range, and regions eastward across the country. The proposed project involves the section of I-80 that provides passage for area residents and commuters from the Fairfield region and beyond. Traffic congestion on I-80 is particularly high within Solano County, especially along the segment where I-80, I-680 and SR 12 converge in the vicinity of the City of Fairfield. In an effort to address the heavy congestion within this segment of I-80, the STA, in conjunction with Caltrans, intends to construct eastbound and westbound regional HOV lanes. The proposed project is necessary to address the cumulative impacts of past and planned development identified in the City of Fairfield General Plan and would not in itself have cumulatively significant impacts. Implementation of the proposed project is consistent with the City of Fairfield General Plan and numerous transportation planning documents. There are no new cumulative impacts associated with the proposed project. *No impact* would occur.

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Chapter 4 List of Preparers

4.1 Technical Reviewers

Maggie Townsley—Project Manager

4.2 Technical Preparers

Shahira Ashkar—Hazards and Hazardous Material, Water Quality/Storm Runoff, Traffic & Transportation

Taryn Nance—Visual/Aesthetics, Land Use, Utilities and Emergency Services

Andrea Gueyger—Hydrology/Floodplain, Geology/Soils/Seismicity/Topography

Shannon Hatcher—Air Quality

Jason Volk—Noise

Dave Buehler—Senior Noise Review

Tim Rimpo—Senior Air Quality Review

Megan Robison—Hydrology and Water Quality Peer Review, Floodplain Review

Lisa Webber—Biological Resources

Angela Alcala—Biological Resources

Stephanie Myers—Biological Resources

Donna Maniscalco—Biological Resources

Jeff Kozlowski—Biological Resources

Appendix A Environmental Checklist

Appendix A Environmental Checklist

1. **Project Title:** Interstate 80 High-Occupancy Vehicle Lane

2. **Lead Agency Name and Address:** California Department of Transportation

3. **Contact Person and Phone Number:** Joseph Douglas, (510) 622-8799

4. **Project Location:** Solano County

5. **Project Sponsor's Name and Address:** Solano Transportation Authority
   One Harbor Center, Suite 130
   Suisun City, CA 94585

6. **General Plan Designation:** Freeway

7. **Zoning:** Freeway

8. **Description of Project:** The Solano Transportation Authority (STA) proposes to construct high-occupancy vehicle (HOV) lanes within the median of Interstate-80 (I-80) from 0.5 miles (0.8 kilometers) west of Red Top Road to 0.5 miles (0.8 kilometers) east of Air Base Parkway in the City of Fairfield , Solano County, California. As part of the project, it is proposed that bridges over three creeks (Suisun Creek, Green Valley Creek, and Ledgewood Creek) and one street (West Texas Street) be widened to accommodate an additional lane in each direction. Minor changes to the truck scales, and minor highway widening in the area of the I-80/I-680 interchange and the area of the truck scales are also proposed. All construction will take place within the highway right-of-way.

9. **Surrounding Land Uses and Setting:** Surrounding land use consists of commercial, industrial, recreational, open space, residential and agricultural uses.

10. **Other Public Agencies whose Approval Is Required:** California Department of Fish and Game; San Francisco Bay Regional Water Quality Control Board; Solano Transportation Authority

Environmental Factors Potentially Affected:

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agricultural Resources	☒ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☒ Hazards and Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☒ Public Services	☐ Recreation	☒ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

Determination: (to be completed by the lead agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions to the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have an impact on the environment that is "potentially significant" or "potentially significant unless mitigated" but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Signature	Date
Printed Name	For

Evaluation of Environmental Impacts:

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained if it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2. All answers must take account of the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an Environmental Impact Report (EIR) is required.

4. "Negative Declaration: Less than Significant with Mitigation Incorporated" applies when the incorporation of mitigation measures has reduced an effect from a "Potentially Significant Impact" to a "Less-than-Significant Impact". The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less-than-significant level. (Mitigation measures from Section XVII, "Earlier Analyses", may be cross-referenced.)

5. Earlier analyses may be used if, pursuant to tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration [Section 15063(c)(3)(D)]. In this case, a brief discussion should identify the following:

   (a) Earlier Analysis Used. Identify and state where earlier analyses are available for review.

   (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   (c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Incorporated," describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, when appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:

   (a) the significance criteria or threshold, if any, used to evaluate each question; and
   (b) the mitigation measure identified, if any, to reduce the impact to a less-than-significant level.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
I.	**AESTHETICS.** Would the project:					
a.	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒	2.1.4.3
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☐	☒	2.1.4.3
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐	2.1.4.3
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☒	☐	2.1.4.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
II.	**AGRICULTURAL RESOURCES.** In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. Would the project:					
a.	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒	2.1.5.3
b.	Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☒	2.1.5.3
c.	Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☒	2.1.5.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
III.	**AIR QUALITY.** When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐	2.2.5.3
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐	2.2.5.3
c.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐	2.2.5.3
d.	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒	2.2.5.3
e.	Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒	2.2.5.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
IV.	**BIOLOGICAL RESOURCES.** Would the project:					
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	2.3.4; 2.3.5; 2.3.6
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	2.3.2.1
c.	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐	2.3.2.2; 2.3.3
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐	2.3.6.5; 2.3.6.6
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐	2.3.8
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐	2.3.8

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
V.	**CULTURAL RESOURCES.** Would the project:					
a.	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒	2.1.5.2
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☐	☒	2.1.5.2
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒	2.1.5.2
d.	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒	2.1.5.2

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
VI.	**GEOLOGY AND SOILS.** Would the project:					
a.	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
	1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐	2.2.3.2
	2. Strong seismic groundshaking?	☐	☐	☒	☐	2.2.3.3
	3. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	2.2.3.3
	4. Landslides?	☐	☐	☐	☒	2.2.3.3
b.	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒	2.2.3.3
c.	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒	2.2.3.3
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒	2.2.3.3
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒	2.2.3.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
VII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:					
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐	2.2.4.3
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	2.2.4.3
c.	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐	2.2.4.3
d.	Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☒	☐	☐	2.2.4.3
e.	Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒	2.2.4.3
f.	Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒	2.2.4.3
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐	2.1.2.2

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
h.	Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐	2.2.4.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
VIII.	**HYDROLOGY AND WATER QUALITY.** Would the project:					
a.	Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐	2.2.2.3
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒	2.2.1.3
c.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite?	☐	☐	☒	☐	2.2.2.3
d.	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite?	☐	☐	☒	☐	2.2.1.3, 2.2.2.3
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒	2.2.2.3
f.	Otherwise substantially degrade water quality?	☐	☒	☐	☐	2.2.2.3
g.	Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒	2.2.1.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
h.	Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	☐	☐	☒	☐	2.2.1.3
i.	Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒	2.2.1.3
j.	Contribute to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒	2.2.1.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
IX.	**LAND USE AND PLANNING.** Would the project:					
a.	Physically divide an established community?	☐	☐	☐	☒	2.1.1.1
b.	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒	2.1.1.1
c.	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒	2.1.1.1

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
X.	**MINERAL RESOURCES.** Would the project:					
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒	2.2.3.3
b.	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒	2.2.3.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
XI.	**NOISE.** Would the project:					
a.	Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	☐	☐	☒	☐	2.2.6.3
b.	Expose persons to or generate excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐	2.2.6.3
c.	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐	2.2.6.3
d.	Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐	2.2.6.3
e.	Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒	2.2.6.3
f.	Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒	2.2.6.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
XII.	**POPULATION AND HOUSING.** Would the project:					
a.	Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒	2.1.5.4
b.	Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	2.1.5.1
c.	Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	2.1.5.1

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
XIII.	**PUBLIC SERVICES.** Would the project:					
a.	Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:					
	Fire protection?	☐	☒	☐	☐	2.1.2.2
	Police protection?	☐	☒	☐	☐	2.1.2.2
	Schools?	☐	☐	☐	☒	2.1.5.4
	Parks?	☐	☐	☐	☒	2.1.5.4
	Other public facilities?	☐	☐	☐	☒	2.1.5.4

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
XIV.	**RECREATION.** Would the project:					
a.	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒	2.1.1.3
b.	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒	2.1.1.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
XV.	**TRANSPORTATION/TRAFFIC.** Would the project:					
a.	Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☒	2.1.3.3
b.	Cause, either individually or cumulatively, exceedance of a level-of-service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒	2.1.3.3
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒	2.1.3.3
d.	Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐	2.1.3.3
e.	Result in inadequate emergency access?	☐	☒	☐	☐	2.1.2.2
f.	Result in inadequate parking capacity?	☐	☐	☐	☒	2.1.3.3
g.	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒	2.1.3.3

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
XVI.	**UTILITIES AND SERVICE SYSTEMS.** Would the project:					
a.	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒	2.1.2.2
b.	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒	2.1.2.2
c.	Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐	2.1.2.2
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	☐	☐	☐	☒	2.1.2.2
e.	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒	2.1.2.2
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒	2.1.2.2
g.	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒	2.1.2.2

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Reference Section
XVII.	**MANDATORY FINDINGS OF SIGNIFICANCE.**					
a.	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐	2.4
b.	Does the project have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☐	☒	2.4
c.	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐	2.4

Appendix B Minimization and/or Mitigation Summary

Appendix B Minimization and/or Mitigation Summary

Mitigation Measure UTL-1: Notify Emergency Service Providers of the Construction Schedule and Any Associated Lane Closures
Mitigation Measure HAZ-1: Prepare a Storm Water Pollution Prevention Plan (SWPPP)
Mitigation Measure HAZ-2: Dispose of ADL-Contaminated Soils in Accordance with Appropriate Regulations
Mitigation Measure HAZ-3: Prepare and Implement Water and Soil Sampling, Testing, and Treatment Plan
Mitigation Measure HAZ-4: Asbestos Removal by Certified Asbestos Abatement Contractor
Mitigation Measure HAZ 5: Notification of Contractors of Presence of Asbestos
Mitigation Measure HAZ-6: Notify Air Pollution Control Office (APCO) of Asbestos-Related Work
Mitigation Measure HAZ-7: Comply with All Applicable Hazardous Waste Management Regulations
Mitigation Measures AQ-1: Implement California Department of Transportation Standard Specification 7-1.01F and Standard Specification 10
Mitigation Measures AQ-2: Implement BAAQMD Control Measures for Construction Emissions of PM10
Mitigation Measure BIO-1: Install Construction Barrier Fencing around the Construction Area to Protect Sensitive Biological Resources to Be Avoided
Mitigation Measure BIO-2: Retain a Biological Monitor to Conduct Weekly Visits during Construction in or near Green Valley, Suisun, and Ledgewood Creeks
Mitigation Measure BIO-3: Avoid and Minimize Potential Indirect Disturbance of Riparian Communities
Mitigation Measure BIO-4: Compensate for Permanent and Temporary Loss of Riparian Vegetation
Mitigation Measure BIO-5: Avoid and Minimize Potential Indirect Disturbance of the Seasonal Wetland near Green Valley Creek
Mitigation Measure BIO-6: Protect Water Quality and Prevent Erosion in Drainages
Mitigation Measure BIO-7: Obtain Required Permits, Authorizations, Certifications, and Agreements
Mitigation Measure BIO-8: Compensate for Permanent and Temporary Loss of Drainage Habitat
Mitigation Measure BIO-9: Install Exclusion Netting on the Undersides of Bridges to Prevent Swallows from Nesting Adjacent to New Bridge Construction
Mitigation Measure BIO-10: Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary
Mitigation Measure BIO-11: Establish a Minimum 6.1-Meter-Wide (20-Foot-Wide) Buffer around All Elderberry Shrubs Where Feasible
Mitigation Measure BIO-12: Conduct Mandatory Contractor/Worker Awareness Training for Construction Personnel
Mitigation Measure BIO-13: Implement Dust Control Measures
Mitigation Measure BIO-14: Compensate for Indirect Impacts on Valley Elderberry Longhorn Beetle Habitat
Mitigation Measure BIO-15: Avoid and Minimize Temporary Impacts on Potential California Red-Legged Frog Aquatic Habitat
Mitigation Measure BIO-16: Compensate for the Loss and Disturbance of California Red-Legged Frog Habitat
Mitigation Measure BIO-17: Prevent Contaminants and Hazardous Materials from Entering the Stream Channel
Mitigation Measure BIO-18: Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons
Mitigation Measure BIO-19: Avoid Potential Fish Spawning Habitat
Mitigation Measure BIO-20: Provide Alternate Migration Corridor through Creek Channel
Mitigation Measure BIO-21: Minimize Impacts on Creek Channel
Mitigation Measure BIO-22: Minimize Noise Impacts on Special-Status Fish Species
Mitigation Measure BIO-23: Avoid the Introduction and Spread of Invasive Plants

Appendix C Title VI Policy Statement

DEPARTMENT OF TRANSPORTATION
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Flex your power!
Be energy efficient!

January 14, 2005

TITLE VI
POLICY STATEMENT

The California Department of Transportation under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, and age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

WILL KEMPTON
Director

Appendix D List of Acronyms

ABAG	Association of Bay Area Governments
ACCM	asbestos-containing construction material
ADL	Aerially deposited lead
APCO	Air Pollution Control Office
ARB	California Air Resources Board
BAAQMD	Bay Area Air Quality Management District
BMP	best management practices
CAAQS	California's ambient air quality standards
Caltrans	California Department of Transportation
CBSC	California Building Standards Code
CCAA	California Clean Air Act
CEG	Certified Engineering Geologist
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CHWMP	County Hazardous Waste Management Plan
Clean Air Plan	air quality attainment plan
CNPS	California Native Plant Society
Corps	U.S. Army Corps of Engineers
CTP	Comprehensive Transportation Plan
CWA	Clean Water Act
DFG	California Department of Fish and Game
EB	eastbound
EPA	Environmental Protection Agency
EPA	U.S. Environmental Protection Agency
ESA	federal Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FSURMP	Fairfield–Suisun Urban Runoff Management Program
General Permit	General Permit for Storm Water Discharges Associated with Construction Activity
GVY	Green Valley Fault
HCP	habitat conservation plan
HOV	high-occupancy vehicle
I-80	Interstate 80
LOMR	Letter of Map Revision

LOS	levels of service
LOTB	Log of Test Borings
LUST	leaking underground storage tank
MIS	Major Investment Study
mph	miles per hour
MPWD	Maine Prairie Water District
MTC	Metropolitan Transportation Commission's
NAC	noise abatement criteria
NEPA	National Environmental Policy Act
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OHWM	ordinary high water mark
PDT	project design team
ppd	pounds per day
Protocol	*Construction Noise and Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects*
RACM	regulated asbestos-containing material
RG	Registered Geologist
ROW	right-of-way
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SACOG	Sacramento Area Council of Governments
SCC	Solano County Code
SCWA	Solano County Water Agency
SEMSC	Solano Emergency Medical Services Cooperative
SFBAAB	San Francisco Bay Area Air Basin
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SID	Solano Irrigation District
SIP	State Implementation Plan
SR	State Route
SRA	shaded riverine aquatic
STA	Solano Transportation Authority
State Water Board	State Water Resources Control Board
STPS	*Strategic Transportation Planning Study*
SWPPP	Storm Water Pollution Prevention Plan
TASAS	Caltrans Traffic Accident Surveillance and Analysis System
TCM	traffic control measures

tpy	tons per year
UBC	Uniform Building Code
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VELB	Valley elderberry longhorn beetle
VMT	vehicle-miles traveled
VOC	volatile organic compounds
WB	westbound
WPCP	Water Pollution Control Program
WQF	Water Quality Flow
WQV	Water Quality Velocity

Appendix E Noise Abatement Information

Table E-1. Traffic Noise Impact Evaluation

Position	Name of Position Shown on Figure	Location	Area	Existing Traffic Noise Level, dBA, L_{eq}(h)	Design-year No-project Traffic Noise Level, dBA, L_{eq} (h)	Design-year With Project Traffic Noise Level, dBA, L_{eq} (h)	Design-year With Project minus Existing, dB	Design-year With Project minus Design-year No-project, dB	Traffic Noise Impact
a1		Carnation Drive	a	67	69	69	+ 2	0	A/E
a2		Lily Street	a	58	60	60	+ 2	0	---
a3	R48 (Figure E-1)	Carnation Drive	a	59	61	61	+ 2	0	---
a4-ST-7	R46 (Figure E-1)	Carnation Drive	a	67	69	69	+ 2	0	A/E
a5-ST-8	R47 (Figure E-1)	Begonia Boulevard	a	57	59	60	+ 3	+ 1	---
a6		Carnation Drive	a	57	59	59	+ 2	0	---
a7		Tulip Street	a	55	56	57	+ 2	+ 1	---
a8		Tulip Street	a	55	57	57	+ 2	0	---
a9	R45 (Figure E-1)	Carnation Drive	a	66	67	68	+ 2	+ 1	A/E
a10		Tulip Street	a	56	58	58	+ 2	0	---
a11		Dahlia Street	a	62	64	64	+ 2	0	---
a12		Dahlia Street	a	58	60	60	+ 2	0	---
b1		Alaska Avenue	b	60	61	62	+ 2	+ 1	---
b2		Alaska Avenue	b	61	62	63	+ 2	+ 1	---
b3		Alaska Avenue	b	65	67	67	+ 2	0	A/E
b4		Pennsylvania Avenue	b	57	58	59	+ 2	+ 1	---
b5		Pennsylvania Avenue	b	68	70	71	+ 3	+ 1	A/E
b6		Pennsylvania Avenue	b	61	62	63	+ 2	+ 1	---
b7	R43 (Figure E-1)	Pennsylvania Avenue	b	70	72	72	+ 2	0	A/E
b8		Pennsylvania Avenue	b	71	73	73	+ 2	0	A/E
b8a	R44 (Figure E-1)	Pennsylvania Avenue	b	63	65	65	+ 2	0	---
b9		Pennsylvania Avenue	b	64	66	66	+ 2	0	A/E
b10		Pennsylvania Avenue	b	71	73	73	+ 2	0	A/E
b11-LT-2	R40 (Figure E-2)	Buckingham Drive	b	72	74	75	+ 3	+ 1	A/E
b12		Flint Way	b	57	58	58	+ 1	0	---
b13	R37 (Figure E-2)	Buckingham Drive	b	69	71	72	+ 3	+ 1	A/E
b14	R36 (Figure E-2)	Buckingham Drive	b	61	63	63	+ 2	0	---
b15		Flint Way	b	56	57	58	+ 2	+ 1	---
b16		Buckingham Drive	b	68	70	71	+ 3	+ 1	A/E
b17		Canterbury Drive	b	56	58	58	+ 2	0	---
b18		Buckingham Drive	b	69	70	72	+ 3	+ 2	A/E
b19		Buckingham Drive	b	62	63	64	+ 2	+ 1	---
b20		Buckingham Drive	b	69	71	72	+ 3	+ 1	A/E
b21-ST-3	R33 (Figure E-2)	Kent Way	b	57	58	59	+ 2	+ 1	---
b22-ST-2	R32 (Figure E-2)	Buckingham Drive	b	61	63	63	+ 2	0	---
b23	R31 (Figure E-2)	Buckingham Drive	b	69	71	72	+ 3	+ 1	A/E
b24		Buckingham Drive	b	62	64	64	+ 2	0	---
b25		Buckingham Drive	b	70	71	72	+ 2	+ 1	A/E
c1		Alvarado Court	c	69	70	72	+ 3	+ 2	A/E
c2		Alvarado Court	c	68	69	70	+ 2	+ 1	A/E
c3		Alvarado Court	c	62	64	65	+ 3	+ 1	---
c4		Alvarado Court	c	60	61	62	+ 2	+ 1	---
c5	R29 (Figure E-2)	Barbour Drive	c	66	68	68	+ 2	0	A/E
c6	R30 (Figure E-2)	Barbour Drive	c	58	60	61	+ 3	+ 1	---
c7		Barbour Drive	c	66	67	68	+ 2	+ 1	A/E

Table 3-7. Continued

Position	Name of Position Shown on Figure	Location	Area	Existing Traffic Noise Level, dBA, L_{eq}(h)	Design-year No-project Traffic Noise Level, dBA, L_{eq} (h)	Design-year With Project Traffic Noise Level, dBA, L_{eq} (h)	Design-year With Project minus Existing, dB	Design-year With Project minus Design-year No-project, dB	Traffic Noise Impact
c8		Barbour Drive	c	57	59	59	+ 2	0	---
c9		Alford Drive	c	66	68	68	+ 2	0	A/E
c10		Alford Drive	c	57	59	59	+ 2	0	---
c11		Barbour Drive	c	54	56	56	+ 2	0	---
c12		Alford Drive	c	66	68	68	+ 2	0	A/E
c13		Alford Court	c	55	57	57	+ 2	0	---
c14		Alford Drive	c	67	68	68	+ 1	0	A/E
c15		Alford Drive	c	58	60	60	+ 2	0	---
c16		Hastings Way	c	55	56	57	+ 2	+ 1	---
c17		Hastings Way	c	55	57	57	+ 2	0	---
c18	R34 (Figure E-2)	Alford Drive	c	67	68	69	+ 2	+ 1	A/E
c19	R35 (Figure E-2)	Alford Drive	c	58	60	60	+ 2	0	---
c20		Alford Drive	c	68	69	70	+ 2	+ 1	A/E
c21		Ramsey Way	c	61	62	63	+ 2	+ 1	---
c22		Ramsey Way	c	60	61	62	+ 2	+ 1	---
c23		Ramsey Way	c	70	72	72	+ 2	0	A/E
c24-ST-10	R38 (Figure E-2)	Mankas Boulevard	c	66	68	68	+ 2	0	A/E
c25-ST-9	R39 (Figure E-2)	Mankas Boulevard	c	68	70	70	+ 2	0	A/E
c26		Lighthouse Drive	c	66	68	68	+ 2	0	A/E
c27		Lighthouse Drive	c	61	63	63	+ 2	0	---
c28	R41 (Figure E-1)	Lighthouse Drive	c	62	63	64	+ 2	+ 1	---
c29	R42 (Figure E-1)	Lighthouse Drive	c	69	71	71	+ 2	0	A/E
c30		Lighthouse Drive	c	66	68	68	+ 2	0	A/E
Trail-1	R21 (Figure E-4)	Fairfield Linear Park	d	70	71	72	+ 2	+ 1	A/E
Trail-2		Fairfield Linear Park	d	69	71	71	+ 2	0	A/E
Trail-3		Fairfield Linear Park	d	68	69	70	+ 2	+ 1	A/E
d1		New Jersey Street	d	65	66	67	+ 2	+ 1	A/E
d2		New Jersey Street	d	67	69	69	+ 2	0	A/E
d3	R23 (Figure E-4)	New Jersey Street	d	70	72	73	+ 3	+ 1	A/E
d4	R24 (Figure E-4)	New Jersey Street	d	61	63	63	+ 2	0	---
d5		New Jersey Street	d	70	72	73	+ 3	+ 1	A/E
d6		New Jersey Street	d	62	64	64	+ 2	0	---
d7		Warren Street	d	58	60	60	+ 2	0	---
d8		New Jersey Street	d	71	72	74	+ 3	+ 2	A/E
d9		New Jersey Street	d	62	64	64	+ 2	0	---
d10-ST-5	R25 (Figure E-3)	Warren Street	d	62	64	64	+ 2	0	---
d11	R26 (Figure E-3)	New Jersey Street	d	71	73	74	+ 3	+ 1	A/E
d12		New Jersey Street	d	62	64	64	+ 2	0	---
d13	R27 (Figure E-3)	Roosevelt Street	d	59	61	61	+ 2	0	---
d14		New Jersey Street	d	71	73	73	+ 2	0	A/E
d15		New Jersey Street	d	62	64	64	+ 2	0	---
d16		New Jersey Street	d	65	67	67	+ 2	0	A/E
d17-ST-4	R28 (Figure E-3)	Michigan Street	d	71	73	74	+ 3	+ 1	A/E
d18		Michigan Street	d	65	67	67	+ 2	0	A/E
e1	R19 (Figure E-4)	Hartford Place	e	67	68	68	+ 1	0	A/E
e2-ST-12	R20 (Figure E-4)	Hartford Place	e	60	62	62	+ 2	0	---
e3		Hartford Place	e	61	62	62	+ 1	0	---

Table 3-7. Continued

Position	Name of Position Shown on Figure	Location	Area	Existing Traffic Noise Level, dBA, L_{eq}(h)	Design-year No-project Traffic Noise Level, dBA, L_{eq} (h)	Design-year With Project Traffic Noise Level, dBA, L_{eq} (h)	Design-year With Project minus Existing, dB	Design-year With Project minus Design-year No-project, dB	Traffic Noise Impact
e4		Hartford Avenue	e	62	64	64	+ 2	0	---
e5		Hartford Avenue	e	62	64	65	+ 3	+ 1	---
e6		Hartford Avenue	e	58	60	60	+ 2	0	---
e7	R22 (Figure E-4)	Hartford Avenue	e	64	66	66	+ 2	0	A/E
e8		Hartford Avenue	e	58	59	60	+ 2	+ 1	---
e9		Oliver Road	e	66	68	68	+ 2	0	A/E
e10		Oliver Road	e	62	64	64	+ 2	0	---
e11		Oliver Road	e	63	65	65	+ 2	0	---
e12		Oliver Road	e	59	61	61	+ 2	0	---
e13		Holiday Lane	e	70	71	72	+ 2	+ 1	A/E
f1		Hamilton Avenue	f	59	60	61	+ 2	+ 1	---
f2-ST-6	R17 (Figure E-5)	Hamilton Avenue	f	59	61	61	+ 2	0	---
f3		Woolner Avenue	f	60	62	62	+ 2	0	---
f4		Barlow Court	f	61	63	63	+ 2	0	---
f5	R14 (Figure E-5)	Raleigh Court	f	63	64	64	+ 1	0	---
Isol SFH #7a 275-ft sh6	R8 (Figure E-7)	Hale Ranch Road	h	71	72	73	+ 2	+ 1	A/E
Isol SFH #7b 425-ft sh6		Hale Ranch Road	h	66	67	69	+ 3	+ 2	A/E
Isol SFH #7c 350-ft sh6		Hale Ranch Road	h	67	69	70	+ 3	+ 1	A/E
Isol SFH #7d 125-ft sh6	R10 (Figure E-7)	Hale Ranch Road	h	71	73	75	+ 4	+ 2	A/E
Isol SFH #6 550-ft sh5	R12 (Figure E-7)	Abernathy Road	i	64	66	66	+ 2	0	A/E
(SFH or comm)		Abernathy Road	i	70	71	71	+ 1	0	A/E
LT-1 sh5	R4 (Figure E-9)	Cordelia Road	h	72	73	75	+ 3	+ 2	A/E
Isol SFH #4 400-ft sh5	R6 (Figure E-8)	Cordelia Road	h	65	66	68	+ 3	+ 2	A/E
ST-1 sh5	R7 (Figure E-8)	Cordelia Road	h	65	66	67	+ 2	+ 1	A/E
Isol SFH #5 450-ft sh5	R9 (Figure E-7)	near Russell Road	i	65	66	68	+ 3	+ 2	A/E
Isol SFH #3a 125-ft sh5	R5 (Figure E-8)	near Rockville Road	i	71	72	74	+ 3	+ 2	A/E
Isol SFH #3b 375-ft sh5		near Rockville Road	i	66	67	69	+ 3	+ 2	A/E
Isol SFH #2 500-ft sh4		near Solano College Road	i	58	59	60	+ 2	+ 1	---
Isol SFH #1 700-ft sh4	R3 (Figure E-9)	near Solano College Road	i	58	59	60	+ 2	+ 1	---
Scandia Rec Center sh4	R2 (Figure E-10)	Central Place, near Pittman Road	j	78	79	80	+ 2	+ 1	A/E
Days Inn Pool sh4	R1 (Figure E-10)	Central Place, near Pittman Road	j	75	76	77	+ 2	+ 1	A/E
Best Western Pool sh4		Central Place, near Pittman Road	j	65	66	66	+ 1	0	A/E
ST-14 sh6	R11 (Figure E-7)	Russell Road	i	64	66	67	+ 3	+ 1	A/E
g1		Chadbourne Road	g	66	67	68	+ 2	+ 1	A/E
g2	R13 (Figure E-6)	Chadbourne Road	g	64	66	66	+ 2	0	A/E
g3		Lozano Lane	g	71	73	73	+ 2	0	A/E
g4		Lozano Lane	g	65	67	67	+ 2	0	A/E
g5-ST-13	R15 (Figure E-5)	Guru Nanak Temple Basketball court	g	72	74	75	+ 3	+ 1	A/E
g6	R16 (Figure E-5)	Lozano Lane	g	67	68	69	+ 2	+ 1	A/E
g7		Lozano Lane	g	66	67	68	+ 2	+ 1	A/E
g8		near Rockville Road	g	69	70	70	+ 1	0	A/E
g9	R18 (Figure E-5)	near Rockville Road	g	69	70	71	+ 2	+ 1	A/E
g10		near Rockville Road	g	67	69	69	+ 2	0	A/E
g11		near Rockville Road	g	66	67	68	+ 2	+ 1	A/E

* A/E = design-year with project level is predicted to approach or exceed the NAC



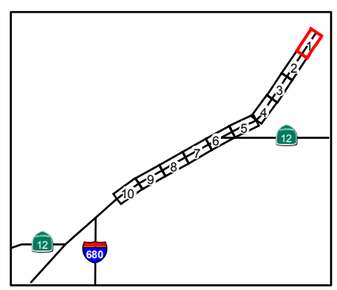
Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-1
Sound Barriers, Noise Monitoring and Monitoring Positions



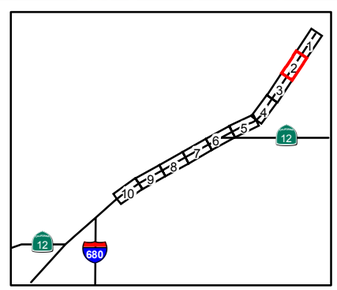
Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-2
Sound Barriers, Noise Monitoring and Monitoring Positions



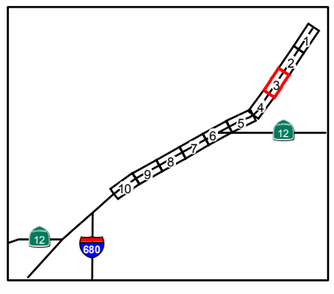
Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-3
Sound Barriers, Noise Monitoring and Monitoring Positions



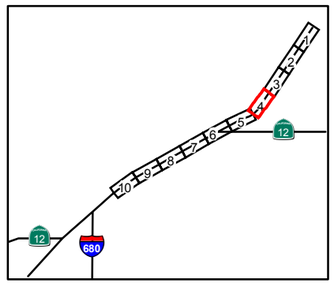
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- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

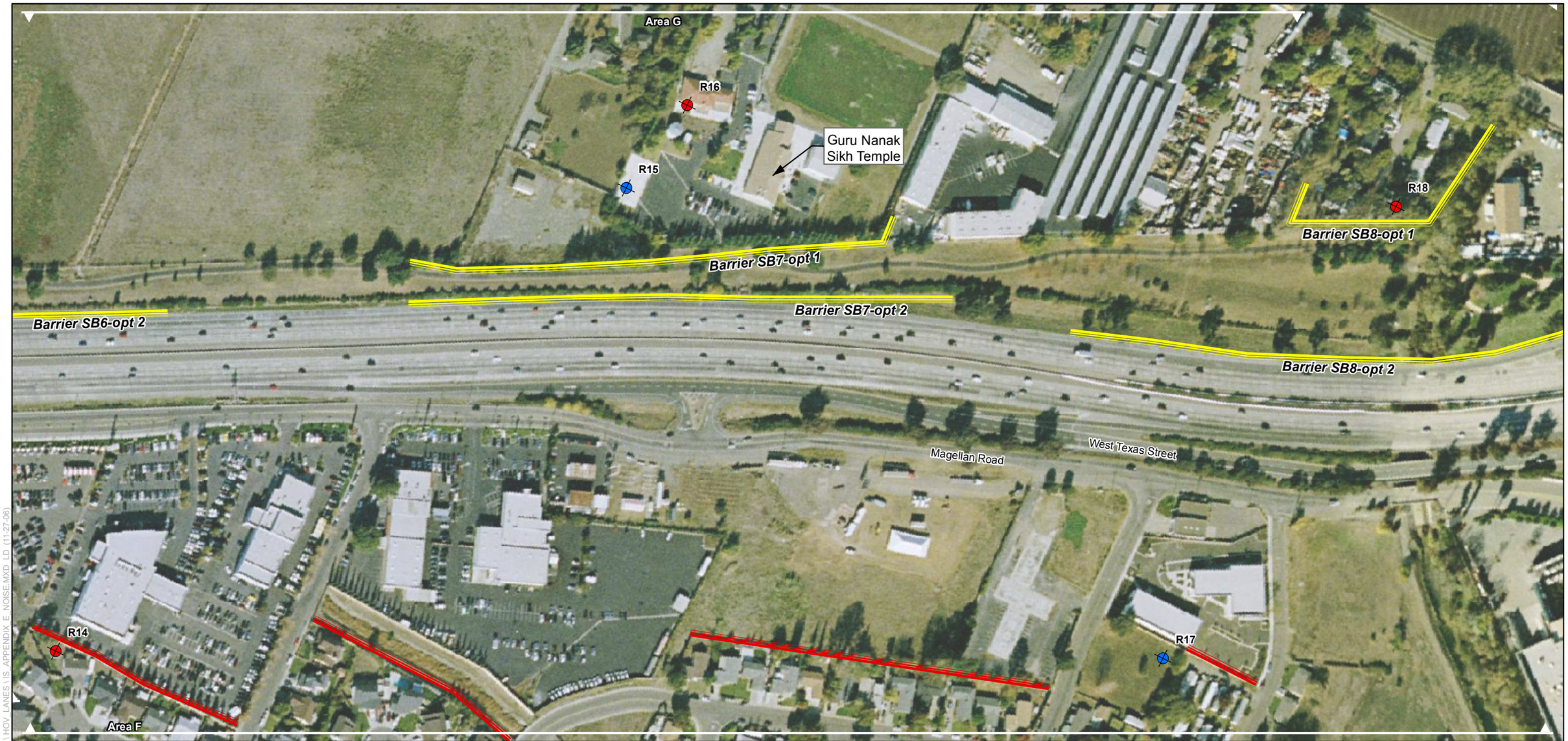
Feet

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Figure E-4
Sound Barriers, Noise Monitoring and Monitoring Positions



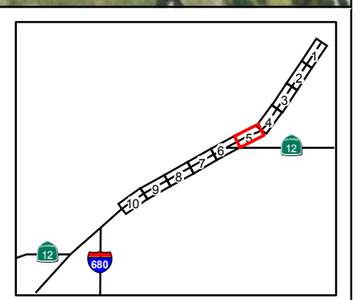
Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-5
Sound Barriers, Noise Monitoring and Monitoring Positions



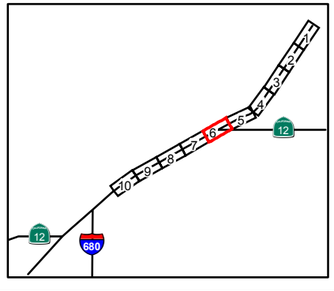
Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-6
Sound Barriers, Noise Monitoring and Monitoring Positions

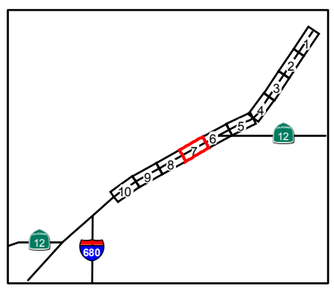


Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200
Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-7
Sound Barriers, Noise Monitoring and Monitoring Positions



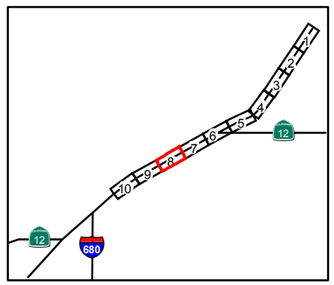
Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-8
Sound Barriers, Noise Monitoring and Monitoring Positions

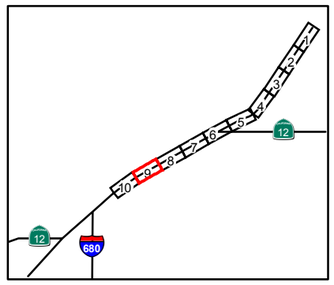


Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200
Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-9
Sound Barriers, Noise Monitoring and Monitoring Positions



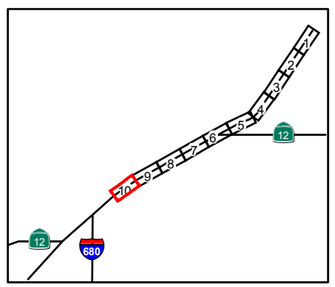
Legend

- Noise Prediction and Measurement Location
- Noise Prediction Location
- Existing Sound Barrier
- Existing and Evaluated Sound Barrier
- Evaluated Sound Barrier

200 100 0 200

Feet

Aerial Photo Source: AirPhoto USA, November 2005



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Figure E-10
Sound Barriers, Noise Monitoring and Monitoring Positions