Interstate 80/Interstate 680/State Route 12 Interchange Project

SOLANO COUNTY, CALIFORNIA
DISTRICT 4-SOL-80 (PM 10.8/17.0); SOL-680 (PM 10.0/13.1);
SOL-SR 12 (PM 1.7/L2.8); and SOL-SR 12 (PM L1.8/4.8)
EA # 0A5300, Project # 04-0000-0150

Final Environmental Impact Report/ Environmental Impact Statement

Volume 1

Prepared by the State of California Department of Transportation

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

Caltrans

October 2012

General Information about This Document

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SCH #2003052021
04-SOL-80-PM 10.8/17.0; 04-SOL-680-PM 10.0/13.1;
04-SOL-SR 12-PM 1.7/L2.8; and 04-SOL-SR 12-PM L1.8/4.8
EA # 0A5300, Project # 04-0000-0150

Construct roadway widening and interchange improvements along Interstate 80/Interstate 680/State Route 12, near the cities of Fairfield and Suisun City.

FINAL ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT

Volume 1

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

THE STATE OF CALIFORNIA
Department of Transportation
and the Cooperating Agency
U. S. Army Corps of Engineers, San Francisco District

10-12-12
Date of Approval

Bijan Sartipi
District Director
California Department of Transportation, District 4

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Abstract: The project consists primarily of improvements to the I-80/I-680/SR 12 Interchange to ease traffic congestions, accommodate projected growth, and improve safety. The project includes expansion and relocation of the westbound truck scales. Project impacts would occur in the following resource areas: Land Use, Growth, Farmlands, Community Impacts, Utilities, Traffic and Transportation, Visual Resources, Cultural Resources, Hydrology, Water Quality, Geology/Soils/Seismic, Paleontology, Hazardous Waste, Air Quality, Noise, Energy, and Biology. The draft environmental document was circulated for public review and comment from August 10 to October 18, 2010.

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Summary

This final environmental impact report/environmental impact statement (EIR/EIS) has been prepared in compliance with the California Environmental Quality Act (CEQA) and State CEQA Guidelines and with the National Environmental Policy Act (NEPA) and the Council for Environmental Quality Regulations for implementing NEPA. The purpose of this Final EIR/EIS is to identify environmental effects associated with the proposed project, identify measures to avoid, minimize or mitigate those effects and disclose all substantive comments and responses on the Draft EIR/EIS.

The Draft EIR/EIS was available for public review from August 10, 2010 to October 18, 2010, during which time public comments were accepted. Written and oral comments were also accepted at a public hearing that was held on September 23, 2010 at the Solano County Administration Building. The comments received and responses to them are provided in Appendix L of this document.

This Final EIR/EIS will be available for review for 30 days (from October 19, 2012 to November 18, 2012), prior to taking action regarding the project.

Overview of Project Area

The project to improve the Interstate 80 (I-80)/Interstate 680 (I-680)/State Route 12 (SR 12) interchange and relocate the westbound truck scales facility is located in the vicinity of the city of Fairfield, Solano County, California. The project area covers some 13 miles encompassing all three highways. The project involves improvements on an approximate 6.2-mile-long segment of I-80 between Red Top Road and Abernathy Road, an approximate 3.1-mile-long segment of I-680 between Gold Hill Road and I-80, 1.1-mile-long segment of SR 12 West (SR 12W) between 0.5 mile west of Red Top Road and I-80, and an approximate 3.0-mile-long segment of SR 12 East (SR 12E) between I-80 and Main Street in Suisun City. The alternatives analyzed in this document consist of two full build alternatives (Alternative B and Alternative C), each with a corresponding fundable the first phase (Alternative B, Phase 1 and Alternative C, Phase 1).

Related Projects

Several related transportation projects are being planned or recently were completed in the general project area. These transportation projects and a number of non-transportation projects are discussed in the cumulative impacts section (Chapter 3.6) of this document and include:

- North Connector Project.
- Interstate 80 High-Occupancy Vehicle Lanes Project.
- I-80 Eastbound Cordelia Truck Scales Relocation Project.
- Jameson Canyon (SR 12) Widening from I-80 to SR 29.
- I-80 Express Lanes Project.
- I-80 Improvements through Fairfield.
- 2010 State Highway Operations and Protection Program (SHOPP) Projects.

- Jepson Parkway.
- Transit Improvements.

Purpose and Need

Purpose

The purposes of the project are listed below. The alternatives presented in this document meet all of the purposes listed below. Neither of the fundable first phases include the relocation of the truck scales and therefore, they would not address the purposes specified under numbers 5 and 6 below. However, they would meet the remaining purposes and would partially meet number 5 by providing congestion relief.

1. Reduce congestion through the I-80/I-680/SR12 interchange complex.
2. Reduce the amount of cut-through traffic on local roads.
3. Encourage the use of high-occupancy vehicle lanes and ridesharing.
4. Improve safety conditions.
5. Accommodate current and future truck volumes on highways.
6. Facilitate adequate inspection and enforcement at truck scales.

Need

The current I-80/I-680/SR 12 interchange complex was constructed approximately 40 years ago. Since the 1960s, the San Francisco Bay Area (Bay Area) and Northern California region have experienced rapid population growth, resulting in substantial increases in regional traffic and truck traffic passing through which results in congestion, delays, and unacceptable levels of service (LOS). The project will address these related deficiencies.

- **Traffic Congestion:** Current traffic volumes along segments of I-80 and I-680 in the project area create heavy traffic congestion with an average travel speed of 46 mph during the morning peak period and 33 mph during the afternoon 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. There are several bottlenecks and LOS F (as defined in vehicles per hour per lane) locations within the freeway system as a result of this congestion. Chapter 3.1.6 discusses this in detail, and Tables 3.1.6-1 and 3.1.6-2 illustrate the correlations between congestion and LOS.
- **Traffic Diverting to Local Roads:** It is estimated that up to 1,450 vehicles (PM peak hour) currently divert from the northbound I-680 to eastbound I-80 connector to alternate routes to bypass the congestion and re-enter eastbound I-80 or eastbound SR12 at locations east of a bottleneck location. This cut-through traffic creates a series of problems along the local street system such as increase of congestion and delay on local roads; reduction of accessibility for local properties and increase of delay for transit and emergency service vehicles
- **Truck-Related Congestion:** The westbound truck scales are located on the most congested freeway segment in Solano County. Trucks slowing to enter the short (approximately 500 feet) off-ramp to the scales, and accelerating to enter I-80 on the short on-ramp from the

scales, exacerbate the congestion problem, as do trucks queuing onto the mainline from the short off-ramp to the facility.

- **Unreliable Freight Transport:** Travel times for truck trips are unpredictable due to queues and congestion.
- **Traffic Safety:** High vehicle volumes, short merge and diverge maneuvers, and short distances between interchanges, all contribute to safety issues in the area. Within the project limits most freeway segments of I-80 (from interchange to interchange) experience a higher total accident rate and a higher fatal and injury rate compared to the statewide averages for similar facilities. Over 60% of the accidents on I-80 were rear-end type collisions. Within the project limits of SR 12 East half of the sections experience higher total accident rates and fatal accident rates than the statewide average for similar facilities. 48% of the accidents on SR 12 East were rear-end type collisions. The majority of accidents on I-80, SR12 West and SR-12 East occurred during commute periods. The combination of high percentages of accidents during commute periods and high percentages of the rear-end type collisions are related to the congestion observed in these sections.

Proposed Project

The proposed project involves improvements on an approximately 4.5-mile-long segment of I-80 between Red Top Road and Abernathy Road, an approximately 3.5-mile-long segment of I-680 between Gold Hill Road and I-80, a 2.0-mile-long segment of SR 12 West (SR 12W) between 0.5 mile west of Red Top Road and I-80, and an approximately 2.5-mile-long segment of SR 12 East (SR 12E) between I-80 and Main Street in Suisun City. Within the limits of the project area, I-80 is a six to ten lane freeway. SR 12E is a divided four-lane highway, I-680 is a four-lane freeway, and SR 12W is an undivided two-lane highway.

Scope of Alternatives in this Document

The proposed project is a project by the California Department of Transportation (the Department) and is subject to state and federal environmental review requirements including the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). In order to meet the requirements of both CEQA and NEPA, two alternatives were developed to meet the future traffic demand with the 20-year planning horizon, taking into consideration environmental and engineering constraints, but not near-term financial constraints (available funding in the short term). These alternatives each represent a comprehensive project on which a Notice of Determination (NOD) could be issued for the purposes of CEQA. In addition, a subset of each full-build alternative was developed that takes into account near-term financial constraints and therefore represents the fundable first phase of the project on which a Record of Decision (ROD) and Notice of Determination (NOD) could be issued for the purposes of NEPA and CEQA. This approach is more fully explained in Chapter 2, Section 2.2.1 of the EIR/EIS.

Alternatives Considered in this Document

Two alternatives (Alternatives B and C) and the associated fundable first phases (Alternative B, Phase 1 and Alternative C, Phase 1) are currently being analyzed in this document. Alternatives B and C are full build alternatives addressing comprehensive improvements to the I-80/I-680/SR 12W interchange; the widening of I-680 and I-80; and the relocation, upgrade, and expansion of the westbound truck scales on I-80.

Alternatives B and C differ primarily in the location of the I-80/I-680/SR 12W interchange improvements and the improvements on SR 12E. Under Alternative B, the I-80/I-680 and I-80/ SR 12W interchanges would be improved in place and a single interchange would be constructed on SR 12E to serve Beck Avenue and Pennsylvania Avenue. Under Alternative C, I-680 would be realigned to the west to connect with the I-80/SR 12W interchange, and two interchanges would be constructed on SR 12E to serve Beck Avenue and Pennsylvania Avenue.

The fundable first phases of the full-build alternatives are Alternative B, Phase 1 and Alternative C, Phase 1. Alternative B, Phase 1 would improve the I-80/Green Valley Road, I-80/I-680, I-80/Suisun Valley Road and the SR 12E/Beck Avenue interchanges. Alternative C, Phase 1 would realign I-680 to the west to connect with the I-80/SR 12W interchange and provide direct connections between all highways except eastbound SR 12W and southbound I-680. Red Top Road would be extended to meet Business Center Drive and interchanges at SR 12W/Red Top Road, I-80/Red Top Road, I-80/Green Valley Road, and I-680/Red Top Road would be constructed or improved. A third lane would be added to SR 12 East from west of Chadbourne Road Undercrossing to the Webster Street exit.

While the fundable first phases of the alternatives would not address all project needs, they would reduce congestion and cut-through traffic on local roads, and improve safety conditions.

Alternative C was identified by the project development team (PDT) as their preferred alternative based upon the following reasons:

- Traffic operations of Alternative C would be superior to Alternative B. Alternative C would include all freeway to freeway movements between I-80 and I-680 via direct connectors, whereas Alternative B would not have a direct connector between I-680 North and I-80 West.
- Alternative C would encourage regional traffic to stay off local roads by providing a high-capacity connection from I-680 to SR 12 West/I-80 West that would carry an acceptable level of traffic during peak hours (500 vehicles per hour in 2035). Without this connection, traffic making the same movement using Alternative B would need to use local roads, either Red Top Road (which would pass by Rodriguez High School) or Lopes Road to the Green Valley Interchange.
- Alternative C would provide drivers on I-680 with standard, outside-lane entrances/exits to I-80. Alternative B would provide these entrances/exits in the median, potentially increasing driver confusion.
- Alternative C would create relatively less traffic friction (less merging on and off the freeway) in the area between Green Valley and Suisun Valley Roads. Alternative B would leave two partial interchanges (I-80/SR 12 West and I-80/I-680) that, together with the median-lane I-680 to I-80 merge and the outer lane braided traffic, could lead to greater traffic friction and driver confusion.
- Alternative C would move I-680 away from the residential areas in Cordelia, reducing noise impacts on an existing community and potential impacts to the Village of Cordelia Historic District.

- The environmental impacts of Alternatives B and C would be similar, including impacts to biology, farmland and other areas of environmental concern.
- Alternative C offers more favorable construction phasing and staging opportunities, as it will be constructed on a new alignment. Staging and construction for Alternative B would be more complicated because the improvements would be constructed essentially in the same alignment and existing traffic would need to be accommodated.
- The Alternative C alignment would affect light industrial areas that are relatively less difficult to relocate, whereas the Alternative B alignment would impact freeway commercial areas that are relatively more difficult to relocate.

The PDT's decision to identify Alternative C as the preferred alternative was made with the following intended results:

- To establish the ultimate Alternative C as a vision and goal to meet identified transportation needs.
- To acknowledge that Alternative C must be implemented in phases due to funding limitations and constraints, and may not be completed until beyond the twenty-year planning horizon.
- To recognize that each phase of Alternative C will have independent utility.
- To work towards the ultimate Alternative C one phase at a time.
- To extend identification of the preferred alternative to Alternative C, Phase 1, upon which additional decisions – Least Environmentally Damaging Practicable Alternative (LEDPA), a Record of Decision under NEPA, the Project Report, permits, final design, and right-of-way work – may be taken.
- To plan for future phases through updating, amending, or adopting new general plans, zoning, transportation plans, and transportation improvement programs.
- To perform additional or supplemental planning, environmental, and engineering work and reach decisions for each future phase as funding becomes possible and as long as there are identified transportation needs that remain.

No-Build Alternative

Under the No-Build Alternative, the facilities associated with the interchange project (freeway lanes, interchanges, ramps, westbound truck scales, and HOV lane direct connectors from I-80 to I-680) would not be constructed. Traffic congestion in the project vicinity would worsen substantially, causing delays of up to six hours and gridlock conditions on the freeway would force traffic onto local roads. Worsened congestion will further exacerbate congestion from truck weaving and backup to the mainline freeways from the truck scale facilities in the westbound direction and truck inspection and enforcement would be impaired due to substantially worsened conditions on the mainline in both directions. Fatal/injury accidents within the project limits, which already exceed statewide the average, will worsen substantially from the increased congestion.

Joint California Environmental Quality Act/National Environmental Policy Act Documentation

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

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, it is quite often the case that a "lower level" document is prepared for NEPA. One of the most commonly seen joint document types is an Environmental Impact Report/Environmental Impact Statement (EIR/EIS).

Following receipt of public comments on the Draft EIR/EIS and circulation of the Final EIR/EIS, the Department will be required to take actions regarding the environmental document. The Department will determine whether to certify the EIR and issue Findings and a Statement of Overriding Considerations under CEQA and to issue a Record of Decision under NEPA.

Project Impacts

Project impacts would occur in the following resource areas: Land Use, Growth, Farmlands, Community Impacts, Utilities, Traffic and Transportation, Visual Resources, Cultural Resources, Hydrology, Water Quality, Geology/Soils/Seismic, Paleontology, Hazardous Waste, Air Quality, Noise, Energy, and Biology. Potentially significant impacts under CEQA may occur in agricultural resources. Project effects under NEPA are discussed fully in Chapter 3. Chapter 4 addresses impacts under CEQA. Table S-1, located at the end of this summary, summarizes the impacts of the project.

Coordination with Public and Other Agencies

Notice of Preparation and Scoping

A notice of preparation of (NOP) for the proposed project was published on April 28, 2003. It was filed with the State Clearinghouse and sent to the appropriate elected officials, agencies, and interested parties.

A scoping meeting for the NOP was held on May 12, 2003 from 6 p.m. to 8:30 p.m. at Rodriguez High School, located at 5000 Red Top Road in Fairfield. An open house was held on March 17, 2009, from 6:30 p.m. to 8:30 p.m. at Nelda Mundy Elementary School, at 580 Vintage Valley Drive in Fairfield.

A number of means were utilized to inform the public of the scoping process and the public open house meeting. A public notice was distributed to the project mailing list, which included property owners, elected officials, city staff, special interest organizations, and neighborhood groups. The Department mailed a letter to agency representatives and elected officials.

Information pertaining to the scoping process and the public open house scoping meeting also appeared on the Solano Transportation Authority website at http://www.solanolinks.com.

Coordination with Agencies

The Department and STA have coordinated with the following federal, state, and local agencies.

- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Department of Agriculture, National Resources Conservation Service
- NOAA's National Marine Fisheries Service
- U.S. Army Corps of Engineers
- Yocha Dehe Wintun Nation
- California Department of Fish and Game
- California Department of Conservation
- Regional Water Quality Control Board
- Office of Historic Preservation
- Bay Conservation Development Commission
- Metropolitan Transportation Commission
- Solano County
- City of Fairfield
- Suisun City
- California Highway Patrol
- Bay Area Air Quality Management District

Public Review and Comment

The Draft EIR/EIS was available for public review from August 10, 2010 to October 18, 2010, during which time comments were accepted. A total of 21 written comments were received from agencies and citizens. Comment letters and responses to comments are provided in Appendix L of this document. Comment letters included comments regarding the following resource areas: Land Use, Farmlands, Utilities, Traffic and Transportation, Hydrology and Floodplain, Air Quality, Noise, and Biological Environment.

A public meeting was held on Thursday, September 23, 2010 at the Solano County Administration Building from 6:00 to 8:00 pm. The purpose of the meeting was to present the Draft EIR/EIS including both build alternatives and their associated fundable first phases and to solicit comments from the public. Twenty-six attendees signed in at the open house. The format of the meeting was an informational open house. Exhibit boards showing the project and addressing all issue areas were available for viewing and Department and STA staff were available to answer questions. Comment forms were available at the public meeting to facilitate

the submission of written comments by attendees. A court reporter was provided at the open house to accept verbal comments. A total of seven comments (four written and three verbal) were submitted at the public meeting.

Comments letters and written and verbal comments from the public meeting and responses to them are provided in Appendix L.

Necessary Permits and Approvals

The table below shows the permits and approvals that would be required.

Required Permits, Approvals and Consultation

Agency	Permit, Approval, or Consultation	Status
U.S. Fish and Wildlife Service	Consultation under Section 7 of the federal Endangered Species Act	A Biological Opinion for Alternative C, Phase 1 has been issued by the USFWS and included in Appendix H
NOAA's National Marine Fisheries Service	Consultation under Section 7 of the federal Endangered Species Act and for Essential Fish Habitat under Magnuson-Stevens Fishery Conservation and Management Act	A concurrence letter has been issued by NOAA's NMFS and is included in Appendix H.
U.S. Army Corps of Engineers	Clean Water Act Section 404 individual permit for placement of fill	Application to be submitted after NEPA completed
California Department of Fish and Game	California Fish and Game Code Section 1602 streambed alteration agreement for waters of the state; potential consultation under Section 2081 of the California Endangered Species Act (CFG Code, Sections 2050 et seq.); CEQA trustee agency	To be completed after CEQA completed
San Francisco Bay Regional Water Quality Control Board	Non-point Clean Water Act Section 402 National Pollutant Discharge Elimination System permit (General Construction Permit), Clean Water Act Section 401 water quality certification	Application to be submitted after CEQA completed
Bay Area Air Quality Management District	Permit for air pollutant emission–generating equipment	Application to be submitted if portable engines and certain other equipment have not previously been registered with the California Air Resources Board after CEQA completed
California Public Utilities Commission	General Order 131-D filing requirements for high-voltage electrical lines	Application to be submitted after CEQA completed
San Francisco Bay Conservation and Development Commission	Marsh Development Permit	Application to be submitted after CEQA completed
Federal Highway Administration	Air Quality Conformity Concurrence	FHWA concurrence letter signed on April 13, 2011
State Historic Preservation Office	Section 106 Compliance and Programmatic Agreement	Programmatic Agreement approved November 8, 2011.

Unresolved Issues

Section 15123(b) of the State CEQA Guidelines requires an EIR to identify areas of controversy known to the lead agency, including issues raised by agencies and the public. During preparation of the environmental document, no known issues of controversy were raised, and no issues remain unresolved.

Table S-1. Comparison of Alternatives

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
HUMAN ENVIRONMENT						
3.1.1—Land Use						
Effect on Fairfield Linear Park	No effect	Minimal impact	No effect	Minimal impact	No effect	None required
3.1.2—Growth						
Potential to Induce Growth	No effect	Any new or intensified development would occur in accordance with county and local plans	Same as Full Build	Same as B	Same as B	None required
3.1.3—Farmlands						
Direct Conversion of Farmland	No effect	18 parcels, ~140 acres affected	None	19 parcels, ~122 acres affected	9 parcels, ~77 acres affected	Provide Replacement Conservation Easement
Conversion of Agricultural Lands under Williamson Act Contracts	No effect	48.76 acres would be converted	None	40 acres would be converted	27.8 acres would be converted	None required
Conversion of Agricultural Lands under Conservation Easements	No effect	22.5 acres of Valine easement converted	None	22.5 acres of Valine easement converted	None	Provide Replacement Conservation Easement
3.1.4—Community Impacts						
Community Character and Cohesion	No effect	No separation or division of an existing neighborhood	Effects would be similar to full build	Same as B; Possible beneficial effect on Cordelia area by moving highway further from residential areas	Effects would be similar to full build	None required
Displacement of Residences and Businesses	No effect	1 residential displacement. 201 partial and 27 full acquisitions of businesses; relocation parcels available	67 partial and 5 full acquisition of businesses; relocation parcels available	1 residential displacement; 144 partial and 32 full acquisitions of businesses; relocation parcels available	54 partial and 9 full acquisitions of businesses; relocation parcels available	Provisions of the Uniform Relocation Act of 1970 will be utilized

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Environmental Justice	No effect	9 displacements in Environmental Justice Block Groups; No residential displacements; business displacements are spread out over project area	Fewer than under full build; Same as B	10 displacements in Environmental Justice Block Groups; Same as B	Fewer than under full build; Same as B	None required
3.1.5—Utilities and Emergency Services						
Potential Effect to Utilities	No effect	Possible impacts on utilities or interruption of service during construction and operation	Same as B	Same as B	Same as B	Minimize Disruption of Utilities Services
Potential Effects on Police, Fire, and Emergency Service Providers during Construction	No effect	Possible short-term effects due to lane closures during construction	Same as B	Same as B	Same as B	Prepare Transportation Management Plan (TMP) with input (regarding detours, truck routes, notifications, etc.) from emergency service providers, the FSUSD, and others.
3.1.6—Traffic and Transportation/Pedestrian and Bicycle Facilities						
Effects on System-Wide MOEs	**2015:** in a.m. peak hour condition would not worsen significantly, but in p.m. peak hour VHD would increase more than 100%,duration of congestion would nearly double, queues on SR 12E would back traffic up on I-80 **2035:** Significant congestion and delays in a.m. peak	Beneficial impact in a.m. peak hour (VMT up 7%, VHD down nearly 70%, network travel speed up 25%) and p.m. peak hour (VMT up 60%, VHD down 70%, network travel speed up 140%)	**2015:** Beneficial impact in p.m. peak hour (VMT up 11%, VHD down 58%, network travel speed up 32%) and very little effect in a.m. peak hour (VMT up less than 0.5%, VHD down 22%, network travel speed up 3%) **2035:** Beneficial impact in a.m. peak hour (VMT up 5%, VHD down 50%,	Same as B	**2015:** Beneficial impact in p.m. peak hour (VMT up 7%, VHD down 39%, network travel speed up 20%) and minimal effect in a.m. peak hour (VMT down less than 0.5%, VHD up 3%, no change in network travel speed) **2035:** Beneficial impact in a.m. peak hour (VMT up 1%, VHD down 18%,	None required

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
	hour; severe congestion on SR 12E in p.m. peak hour		network speed up 17%) and in the p.m. peak hour (VMT up 39%, VHD down 47%, network speed up 82%)		network speed up 6%) and in the p.m. peak hour (VMT up 16%, VHD down 16%, network speed up 25%)	
Effects on Travel Times	**2015:** Peak direction travel times would increase to 8 to 15 minutes in the a.m. peak hour, and 12 to 34 minutes in the p.m. peak hour **2035:** Peak direction travel times would increase to 10 to 20 minutes in the a.m. peak hour and 28 to 99 minutes in the p.m. peak hour	Beneficial impact, peak direction reduction in travel time of 17%–70% in a.m. peak hour and 35%–80% in the p.m. peak hour	**2015:** Beneficial impact, peak direction reduction in travel time of 1%–38% in the a.m. peak hour and 46%–85% in the p.m. peak hour **2035:** Beneficial impact, peak direction reduction in travel time of 10%-50% in the a.m. peak hour and 19%-73% in the p.m. peak hour	Beneficial impact, peak direction reduction in travel time of 20%–60% in the a.m. peak hour and 40%–80% in p.m. peak hour	**2015:** Beneficial impact, peak direction reduction in travel time of 0%–7% in a.m. peak hour, and 10%–60% in p.m. peak hour. **2035:** Beneficial impact in a.m., peak direction reduction in travel time of 5%–20%; beneficial impact on travel time, 3% in I-80 and 28% improvement on the EB SR 12 to EB I-80 connector in the p.m. peak hour (see Section 3.1.6)	None required
Effects on Freeway Operations	**2015:** In a.m. peak hour, bottleneck on WB SR 12E; congestion remains at near existing levels, with congested period lasting about 1.5 hours. In p.m. peak hour, bottlenecks on EB I-80, EB SR 12Et, and WB SR 12E; congested period increases to 3 hours.	In a.m. peak hour, no bottlenecks within project limits; congestion decreases to existing levels (relative to 3 hours under 2035 No Build). In p.m. peak hour, bottleneck on EB I-80 at Air Base Parkway (east of project limits), congested period decreases to 3 hours (relative to 6 hours under No Build).	**2015:** In a.m. peak hour, bottleneck on WB SR 12E; congestion remains near existing levels. In p.m. peak hour, bottleneck on EB SR 12E, congestion decreases to near existing levels (relative to 3 hours under 2015 No Build). **2035:** In a.m. peak hour, bottlenecks on SR 12W WB and SR	In a.m. peak hour, no bottlenecks within project limits; congestion decreases to near existing levels (relative to 3 hours under 2035 No Build). In p.m. peak hour, bottleneck on EB I-80 at Air Base Parkway (east of project limits), congested period decreases to 3 hours (relative to 6 hours under 2035 No Build).	**2015:** In a.m. peak hour, bottleneck on WB SR 12E; congestion remains near existing levels. In p.m. peak hour, bottleneck on EB and WB SR 12E; congested period decreases to about 2 hours (relative to 3 hours under 2015 No Build). **2035:** In a.m. peak hour, bottlenecks on	None required

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
	2035: In a.m. peak hour, bottlenecks on WB 12W, I-80, and 12E in a.m. peak hour, congested period increases to 3 hours. In p.m. peak hour, bottlenecks in both directions on SR 12E and I-80, on SR 12W EB, and I-680 NB; congested period increases to 6+ hours.		12E WB, congestion decreases to near existing levels (relative to No Build). In p.m. peak hour, bottlenecks on I-80 WB, I-80 EB, SR 12W EB, and SR 12E EB; congested period would decrease to 4.5 hours (relative to 6 hours under 2035 No Build)		EB and WB SR 12E; congested period decreases to 2.5 hours, relative to 3 hours under 2035 No Build. In p.m. peak hour, I-80 WB, I-80 EB, SR 12W EB, and SR 12E WB and EB; congested period would decrease to 5 hours, relative to 6 hours under 2035 No Build	
Effects on Intersection Operations	**2015:** in the a.m. peak hour, 3 intersections would operate unacceptably (one ramp terminal intersection and two non-ramp terminal intersections); in the p.m. peak hour, 9 intersections would operate unacceptably (5 ramp terminal intersections and 4 non-ramp terminal intersections). **2035:** in the a.m. peak hour 8 intersections would operate unacceptably (4 ramp terminal intersections and 4 non-ramp terminal intersections); in the p.m. peak hour, 22 intersections would operate unacceptably	All intersections except Lopes Road/Gold Hill Road would operate acceptably in a.m. peak hour; in p.m. peak hour 4 non-ramp terminal intersections would continue to operate unacceptably	**2015:** two non-ramp terminal intersections would operate unacceptably in the a.m. peak hour; in p.m. peak hour, 1 ramp terminal intersection and 3 non-ramp terminal intersections would operate unacceptably **2035:** one ramp terminal intersection and 3 non-ramp terminal intersections would operate unacceptably in the a.m. peak hour; 8 ramp terminal intersections and 7 non-ramp terminal intersections would operate unacceptably in the p.m. peak hour	All intersections would operate acceptably in the a.m. peak hour; 3 non-terminal ramp intersections would operate unacceptably in the p.m. peak hour	**2015:** one ramp terminal intersection would operate unacceptably in the a.m. peak hour; in the p.m. peak hour, 3 ramp terminal intersections and 2 non-ramp terminal intersections would operate unacceptably **2035:** one ramp terminal intersection would operate unacceptably in the a.m. peak hour; in the p.m. peak hour, 3 ramp terminal intersections and 5 non-ramp terminal intersections would operate unacceptably	Design and construct intersection improvements (including signalization, land configuration changes, approach widening, and operational improvements) at project on-ramp terminal and non-ramp terminal intersections to maintain intersection at acceptable levels of service.

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
	(14 ramp terminal intersections and 8 non-ramp terminal intersections).					
Effects on Pedestrian and Bicycle Facilities	No effect	May require special design or construction measures to ensure that existing facilities can be maintained	Same as B	Same as B	Same as B	Design each phase of the project to accommodate existing and planned bicycle and pedestrian facilities within the project area, including providing for alternative connecting routes if and where needed
Effects on Transit Routes and Service	Worsened traffic conditions in p.m. peak hour in 2015 and 2035 will result in delays for buses and paratransit vehicles	Improved traffic operations would reduce delays for buses and paratransit vehicles	Same as B	Same as B	Same as B	Adjust Transit Routes and Stops as Needed
Construction Period Disruption of Vehicle, Pedestrian, and Bicycle Circulation	No effect	Construction would result in temporary additional traffic from construction vehicles and workers and possible temporary lane closures and detours	Same as B	Same as B	Same as B	Minimize Impacts through a Transportation Management Plan (TMP) and Construction Scheduling
3.1.7—Visual and Aesthetic Resources						
Temporary Visual Impacts Caused by Construction Activities	No effect	Temporary impacts that would not contrast with existing visual character	Same as B, but to a lesser extent	Same as B	Same as B, but to a lesser extent	None required
Long-Term Changes in Visual Quality and Character	No effect	Result in adverse and beneficial changes to visual quality and character. Adverse visual impacts would occur at Viewpoint 8 in Landscape Unit 1 and	Same as B, but to a lesser extent	Result in adverse and beneficial changes to visual quality and character. Adverse visual impacts would occur at viewpoints 6 and 8 in Landscape	Same as C, but to a lesser extent.	Design westbound truck scales to be visually compatible with local architectural features of the surrounding community Incorporate Aesthetic

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
		Viewpoint 2 in Landscape Unit 3.		Unit 1 and Viewpoint 2 in Landscape Unit 3.		Recommendations in Design of Freeway-Related Structures Replace Landscaping as Appropriate
Light and Glare	No effect	Increased lighting and glare during construction and, to some extent, during operations, but consistent with existing conditions	Same as B	Same as B	Same as B	Direct lighting only where needed, and away from residences
3.1.8—Cultural Resources						
Effects on Unknown or Known Resources from Construction	No effect	Potential to disturb buried cultural resources during construction	Same as B	Same as B	Same as B	Implement Programmatic Agreement and associated Historic Properties Treatment Plan; identify and evaluate cultural resources, avoid and minimize impacts to historic properties and mitigate through data recovery Avoid or proceed with caution in locations determined by investigations to have potential subsurface resources Stop Work if Buried Cultural Deposits Are Encountered during Construction Activities
Discovery of Human Remains during Construction	No effect	Potential to disturb buried human remains during construction	Same as B	Same as B	Same as B	Protect Human Remains if Encountered during Excavation Activities as per State Health and Safety Code Section 7050.5 and Public Resources Code 5097
Potential to Affect Historic Properties at 177 Main	No effect	Construction on the parcel would create	No effect; no project improvements in the	Same as B	No effect; no project improvements in the	None required

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Street, the Suisun City Train Depot (APN 0032-020-240)		visual impact, but would not substantially alter the existing setting, so no adverse effect would result	area		area	
Potential to Affect Village of Cordelia Historic District	No effect	Construction on empty parcel within the district boundaries will not affect integrity of district	Same as B	Removal of elevated ramps may result in beneficial visual impact	Removal of elevated ramps may result in beneficial visual impact	None required
Potential to Affect Suisun City Historic District	No effect	Construction at the edge of the district would result in minor visual impact but would not substantially alter the existing setting, so no adverse effect would result	No effect; no project improvements in the area	Same as B	No effect; no project improvements in the area	None required
Effects to Historic Resource Protected under Section 4(f)	No effect	Minor or negligible impact on the Suisun City Train Depot (APN 0032-020-240), and the Village of Cordelia and Suisun City Historic Districts	Minor or negligible impact on the Village of Cordelia Historic District	Minor or negligible impact on Suisun City Train Depot (APN 0032-020-240) and Suisun City Historic District	No effect	None required
PHYSICAL ENVIRONMENT						
3.2.1—Hydrology and Floodplain						
Hydraulic Capacity and Floodplain of Green Valley Creek	No effect	Flow characteristics would be improved; existing structures would be replaced with freespan structures; existing piers would be removed	Same as B	Same as B	Same as B	None required
Hydraulic Capacity and Floodplain of Dan Wilson	No effect	Flow characteristics would be improved; existing structures	Same as B	Same as B	No effect; no project improvements in the	None required

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Creek		would be replaced with freespan structures; existing piers would be removed			area	
Hydraulic Capacity and Floodplain of Suisun Creek	No effect	Flow characteristics would be improved; existing structures would be replaced with freespan structures; existing piers would be removed	No effect; no project improvements in the area	Same as B	No effect; no project improvements in the area	None required
Hydraulic Capacity and Floodplain of Raines Drain	No effect	Increased mainline elevation (up to 3' higher) and relocation of westbound truck scales (reduction of floodplain storage) will result in impacts on the existing floodplain	No effect; no project improvements in the area	Same as B	No effect; no project improvements in the area	Work with appropriate agencies to address flooding issues related to Raines Drain. (A separate regional flood control study is being conducted jointly by STA and SCWA to identify flooding impacts, potential improvements, and benefits in the area.) Construct Upstream Inlet Structure and Underground Flood Control Storage
Hydraulic Capacity and Floodplain of Alonzo Drain and Ledgewood Creek	No effect	New bridges over Ledgewood Creek would be freespan; bridge/culvert widening would not alter existing conditions	Bridge/culvert widening would not alter existing conditions	Same as B, Phase 1	Same as B, Phase 1	None required
Hydraulic Capacity and Floodplain of Pennsylvania Avenue Creek	No effect	Culvert widening and new culverts would not alter existing conditions	No effect; no project improvements in the area	Same as B	No effect; no project improvements in the area	None required

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.2.2—Water Quality and Stormwater Runoff						
Increased Runoff and Associated Operational Water Quality Issues	No effect	Increase in impervious surfaces would result in increase in runoff	Same as B, but to a lesser extent	Same as B	Same as B, but to a lesser extent	Construct Upstream Inlet Structure and Underground Flood Control Storage Implement Storm Water Pollution Prevention Plan and Best Management Practices
Potential Water Quality, Erosion and Sediment Control Issues during Construction	No effect	Potential for sediment or pollutants associated with construction to enter waterways	Same as B, but to a lesser extent	Same as B	Same as B, but to a lesser extent	Implement Storm Water Pollution Prevention Plan and Best Management Practices
Potential to Require Dewatering during Construction	No effect	Anticipated due to water level	Same as B	Same as B	Same as B	Implement Storm Water Pollution Prevention Plan and Best Management Practices
3.2.3—Geology/Soils/Seismic/Topography						
Risk of Fault Rupture during Operations	No effect	Potential impact due to faults in the vicinity	Same as B	Same as B, though elevated structures are proposed in immediate vicinity of faults	Same as C	Structures will be designed to meet the regulations and standards associated with UBC Seismic Hazard Zone 4/CBSC standards, Department standards, and (if applicable) County General Plan standards to minimize potential fault rupture risks on associated project features Implement Recommendations from Draft Geotechnical Reports to Accommodate Permanent Fault-Related Ground Deformation Effects from Surface Fault Rupture on Project Facilities and to Accommodate Effects of Ground Shaking on Project Facilities

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Risk from Ground Shaking during Operation	No effect	Potential impact due to active faults in the vicinity	Same as B	Same as B	Same as B	Structures will be designed to meet the regulations and standards associated with UBC Seismic Hazard Zone 4/CBSC standards, Department standards, and (if applicable) County General Plan standards to minimize potential ground shaking risks on associated project features Implement Recommendations from Draft Geotechnical Reports to Accommodate Permanent Fault-Related Ground Deformation Effects from Surface Fault Rupture on Project Facilities and to Accommodate Effects of Ground Shaking on Project Facilities
Risks from Development on Unstable Materials	No effect	Potential impact at bridge and overcrossing locations	Same as B	Same as B	Same as B	Design structures and facilities to account for unstable materials Implement Recommendations from Draft Geotechnical Report to Accommodate Effects of Liquefaction on Project Facilities/Design Specific Project Elements to Accommodate Effects of Liquefaction
Risk from Landslides or Other Slope Failure during Operation	No effect	Potential effects from landslides and debris flows in hilly areas of the project area	Same as B	Same as B	Same as B	Incorporate specific recommendations pertaining to cut slopes and fill slopes/embankments into the project design. For cut slopes, implement slope gradients, rock bedding and joint evaluation, drilling and geophysical testing, and

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
						slope stabilization measures. For fill slopes/embankments, implement slope gradients and slope stabilization measures. Conduct Future Geotechnical Investigation/Implement Preliminary Recommendations from Draft Geotechnical Report to Accommodate Effects of Slope Failure on Project Facilities
Risk during Operation as a Result of Development on Expansive Soils	No effect	Soils in the project area have moderate to high shrink-swell potential	Same as B	Same as B	Same as B	Structures will be designed to meet the regulations and standards associated with UBC Seismic Hazard Zone 4/CBSC standards, Department standards, and (if applicable) County General Plan standards to minimize potential shrink-swell hazards on associated project features
Risk during Operation as a Result of Weak Foundation Materials and Postconstruction Settlement	No effect	Potential consolidation settlement hazard in the vicinity of Suisun Valley Road and Dan Wilson Creek	Same as B	Same as B	Potential consolidation settlement hazard in the vicinity of Suisun Valley Road	Addressed by designing project facilities to the embankment construction standards outlined in the Department's Standard Specifications Section 19 Additional measures such as phased construction, implementation of waiting periods, surcharge fill, wick drain installation, and monitoring may be implemented, if necessary Implement Preliminary Recommendations from Draft Geotechnical Report to Accommodate Effects of

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
						Consolidation Settlements on Project Facilities
Runoff, Erosion, and Sedimentation from Grading Activities Associated with Construction	No effect	Potential impact during construction activities	Same as B	Same as B	Same as B	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices
3.2.4—Paleontology						
Destruction of Vertebrate or Otherwise Scientifically Significant Paleontological Resources as a Result of Construction Activities	No effect	Excavation for foundations in sensitive units could result in the inadvertent destruction of fossil resources	Same as B, but to a lesser extent as less excavation occurs in high-sensitivity areas	Same as B, but to a greater extent as there would be more excavation in sensitive units	Same as B, but to a lesser extent as less excavation occurs in high-sensitivity areas	Conduct preconstruction studies to ensure that paleontological materials exposed at the surface are recovered and properly prepared and curated, or protected from damage using exclusion fencing or other appropriate means, and to further assess potential impacts Train Construction Personnel in Recognizing Fossil Material A qualified professional paleontologist as defined by the Department's Standard Environmental Reference will monitor activities during key portions of the project (typically, those involving substantial disturbance in previously undisturbed materials with paleontological sensitivity) Stop Work and consult with a qualified professional paleontologist if fossil remains are encountered during construction

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.2.5—Hazardous Waste/Materials						
Exposure of Humans and the Environment to Groundwater Contamination as a Result of Construction Activities	No effect	Project area has a moderate to high risk of groundwater contamination	Same as B	Same as B	Same as B	Test groundwater for contaminants identified in the ISA report
Potential for Exposure of Construction Workers or Nearby Land Uses to Previously Unknown Hazardous Materials as a Result of Construction Activities	No effect	Project area has a moderate risk of previously unreported hazards	Same as B	Same as B	Same as B	Implement a Health and Safety Plan
Potential for Exposure of Known Hazardous Materials to Humans or the Environment as a Result of Construction Activities	No effect	Hazardous materials present may include heavy metals, ACMs, contaminated soils, ADL	Same as B	Same as B	Same as B	Handle, remove, store, and dispose Yellow Striping according to Health and Safety Plan Dispose of Soils Contaminated with ADL, Arsenic, Pesticides, and Herbicides in Accordance with Appropriate Regulations Contractors will coordinate the timing of construction activities with individual growers on parcels within or adjacent to the project area to avoid any aerially applied chemical impacts on workers during construction
Potential for Exposure of Humans and the Environment to Hazardous Conditions from the Accidental Release of Hazardous Materials as a Result of Construction Activities	No effect	Potential for accidental release of materials associated with construction equipment, or from utility lines	Same as B	Same as B	Same as B	Implement a Health and Safety Plan

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.2.6—Air Quality						
Conformity with the Regional Transportation Plan	No effect	N/A	Not in RTP	N/A	This alternative is included in 2035 RTP and 2011 TIP	None required
Potential Violations of Carbon Monoxide NAAQS or CAAQS	Not anticipated to exceed 1- or 8-hour NAAQS or CAAQS	Not anticipated to exceed 1- or 8-hour NAAQS or CAAQS	Same as B	Same as B	Same as B	None required
Potential Violations of PM2.5 NAAQS or CAAQS	No effect	Project determined to be a Project of Air Quality Concern, but no new violations.	Same as B	Same as B	Same as B	None required
Potential for Generation of MSAT Emissions	Lower MSAT emissions than all build alternatives except Alternative C, Phase 1 for 2035	Minor increase in all MSAT emissions compared to No Project conditions	Same as B	Same as B	Minor increase in all MSAT emissions for 2015; minor increase in all but 2 air toxics for 2035	Implement Measures to Reduce MSAT and Criteria Pollutant Emissions
Potential Generation of Operation-Related Emissions of Ozone Precursors, Carbon Monoxide, and Particulate Matter	Lower emissions of ozone precursors than all build alternatives except Alternative C, Phase 1 for 2035	Minor increase in emissions of all ozone precursors compared to No Project conditions	Same as B	Same as B	Same as B, except for decrease in ROG, PM10 and PM2.5 for 2035	Implement Measures to Reduce MSAT and Criteria Pollutant Emissions
Potential Temporary Increase in Ozone Precursors (ROG and NOx), CO, and PM10 Emissions during Grading and Construction Activities	No effect	Temporary increase in all ozone precursors due to construction	Same as B	Same as B	Same as B	Addressed by construction-related PM_{10} emission minimization measures in the Department's Standard Specifications Section 14 Implement Additional Control Measures where practicable for Construction Emissions of Fugitive Dust Implement Measures to Reduce Exhaust Emissions from Off-Road Diesel Powered Equipment

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.2.7—Noise						
Exposure of Noise Sensitive Land Uses to Increased Traffic Noise	Noise levels would increase as traffic congestion increases	No effect under NEPA, however, increased noise in areas D, E, and R affecting 49 units	No effect under NEPA, however, increased noise in areas D, E, and R affecting 21 units	No effect under NEPA, however, increased noise in areas E, H, and R affecting 37 units	No effect under NEPA, however, increased noise is area E affecting 1 unit	None required, abatement considered and found not cost reasonable
Exposure of Noise-Sensitive Land Uses to Construction Noise	No effect	Construction equipment would generate noise	Same as B	Same as B	Same as B	Addressed by construction-related noise minimization measures in the Department's Standard Specifications Section 14-8.02
BIOLOGICAL ENVIRONMENT						
3.3.1—Natural Communities						
Loss or Disturbance of Riparian Woodland Resulting from Construction	No effect	Permanent loss of 1.31 acres; temporary disturbance of 0.41 acre	Permanent loss of 0.10 acre; temporary disturbance of 0.06 acre	Permanent loss of 2.24 acres; temporary disturbance of 0.25 acre	Permanent loss of 1.11 acres; temporary disturbance of 0.08 acre	Avoid and Minimize Potential Disturbance of Riparian Communities Compensate for Temporary and Permanent Loss of Riparian Vegetation
Permanent Loss and Temporary Disturbance of Oak Woodlands	No effect	Blue Oak: Temporary disturbance of 0.52 acre Valley Oak: Permanent loss of 0.16 acre; temporary disturbance of 0.03 acre Live Oak: Permanent loss of 5.16 acres; temporary disturbance of 4.12 acres	Blue Oak: Temporary disturbance of 0.50 acre Valley Oak: Permanent loss of 0.19 acre; temporary disturbance of <0.01 acre	Blue Oak: Temporary disturbance of 0.52 acre Valley Oak: Permanent loss of 0.17 acre; temporary disturbance of 0.02 acre Live Oak: Permanent loss of 12.17 acres; temporary disturbance of 1.68 acres	Valley Oak: Permanent loss of 0.14 acre; temporary disturbance of 0.02 acre Live Oak: Permanent loss of 11.77 acres; temporary disturbance of 2.03 acres	Avoid and Minimize Potential Disturbance of Riparian Communities Compensate for Temporary and Permanent Loss of Riparian Vegetation

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.3.2—Wetlands and Other Waters						
Loss or Disturbance of Perennial Drainage Resulting from Construction	No effect	Permanent loss of 0.67 acre; temporary disturbance of 1.0 acre	Permanent loss of 0.08 acre; temporary disturbance of 0.88 acre	Permanent loss of 0.66 acre; temporary disturbance of 0.92 acre	Permanent loss of 0.10 acre; temporary disturbance of 0.51 acre	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Restore Temporarily Disturbed Drainage Habitat and Compensate for Permanent Loss of Drainage Habitat
Loss of Nonjurisdictional Constructed Seasonal Drainages	No effect	Permanent loss of 0.11 acre; temporary disturbance of 0.17 acre	No effect	Permanent loss of 0.11 acre; temporary disturbance of 0.17 acre	Permanent loss of <0.01 acre; temporary disturbance of 0.05 acre	None required
Loss or Disturbance of Jurisdictional Seasonal Drainages Resulting from Construction	No effect	Permanent loss of 2.22 acres; temporary disturbance of 0.78 acre	Permanent loss of 1.25 acres; temporary disturbance of 0.23 acre	Permanent loss of 2.28 acres; temporary disturbance of 0.52 acre	Permanent loss of 1.95 acre – 1.52 with fill reduction of 0.43 acre achieved through design refinements; temporary disturbance of 0.40 acre	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Restore Temporarily Disturbed Drainage Habitat and Compensate for Permanent Loss of Drainage Habitat
Loss or Disturbance of Nonjurisdictional Perennial Marsh		Permanent loss of 0.03 acre; temporary disturbance of 0.01 acre	Permanent loss of 0.04 acre	No effect	No effect	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Restore Temporarily Disturbed Drainage Habitat and Compensate for Permanent Loss of Drainage Habitat Restore Temporarily Disturbed Perennial Marsh Compensate for Permanent Loss of Wetlands

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Loss or Disturbance of Jurisdictional Perennial Marsh Resulting from Construction	No effect	Permanent loss of 5.15 acres; temporary disturbance of 4.68 acres	Permanent loss of 0.34 acre; temporary disturbance of 1.26 acres	Permanent loss of 5.03 acres; temporary disturbance of 3.68 acres	Permanent loss of 0.44 acre – 0.07 acre with fill reduction of 0.37 acre achieved through design refinements; temporary disturbance of 1.66 acre	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Restore Temporarily Disturbed Drainage Habitat and Compensate for Permanent Loss of Drainage Habitat Restore Temporarily Disturbed Perennial Marsh Compensate for Permanent Loss of Wetlands
Loss or Disturbance of Alkali Seasonal Marsh Resulting from Construction	No effect	Permanent loss of 1.75 acres; temporary disturbance of 0.28 acre	No effect	Permanent loss of 1.03 acre; temporary disturbance of 0.13 acre	No effect	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Compensate for Permanent Loss of Wetlands Construct a Retaining Wall on the South Side of SR 12E
Loss or Disturbance of Nonjurisdictional Seasonal Wetland	No effect	Permanent loss of 0.03 acre	Permanent loss of 0.02 acre	Permanent loss of 0.36 acre; temporary disturbance of up to 0.01 acre	Permanent loss of 0.34 acre; temporary disturbance of up to 0.01 acre	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands
Loss or Disturbance of Jurisdictional Seasonal Wetland Resulting from Construction	No effect	Permanent loss of 7.84 acres; temporary disturbance of 1.85 acres	Permanent loss of 1.82 acres	Permanent loss of 8.62 acres; temporary disturbance of 0.70 acre	Permanent loss of 3.88 acres – 2.88 acres with fill reduction achieved through design refinements	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Construct a Retaining Wall on the South Side of SR 12E Compensate for Permanent Loss of Wetlands

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.3.3—Plant Species						
Potential direct and indirect effects on Alkali Milk-Vetch	No effect	Potential to remove or disturb plants if present in the future	No effect	Potential to remove or disturb plants if present in the future	No effect	Conduct preconstruction surveys for special-status plants Compensate for loss of special-status plants
Loss or Disturbance of Pappose Tarplant	No effect	Loss of 185 plants	No effect	Loss of 200 plants	Loss of 2 plants	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Conduct preconstruction surveys for special-status plants Compensate for loss of special-status plants
Potential direct and indirect effects on Streamside Daisy	No effect	Potential to remove or disturb plants if present in the future	No effect	Potential to remove or disturb plants if present in the future	No effect	Conduct preconstruction surveys for special-status plants Compensate for loss of special-status plants
Direct and Indirect Effects to Saline Clover	No effect	Loss of 35 plants	No effect	Loss of 65 plants	No effect	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Conduct preconstruction surveys for special-status plants Compensate for loss of special-status plants

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.3.4—Animal Species						
Potential Loss or Disturbance of Western Pond Turtles Resulting from Construction	No effect	Construction in and near ponds and streams could result in loss or disturbance of habitat	Same as B	Same as B	Same as B, but to a lesser extent as there would be less construction in or near suitable aquatic habitat	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Avoid and Minimize Potential Disturbance of Riparian Communities Compensate for Temporary and Permanent Loss of Riparian Vegetation Conduct Clearance Surveys for Western Pond Turtle
Potential Disturbance of Nesting White-tailed Kites Resulting from Construction	No effect	Tree removal and construction noise could result in disturbance to nesting birds	Same as B	Same as B	Same as B	Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary
Potential Disturbance of Burrowing Owls and Permanent Loss of Habitat Resulting from Construction	No effect	Construction activities could disturb nesting owls and implementation of the project would result in loss of nesting and foraging habitat	Same as B	Same as B	Same as B	Conduct Preconstruction Surveys for Active Burrowing Owl Burrows and Implement the California Department of Fish and Game Guidelines for Burrowing Owl Mitigation, if Necessary Compensate for Loss of Burrowing Owl Nesting Habitat
Potential Disturbance of Nesting Northern Harriers Resulting from Construction	No effect	Construction activities could disturb nesting birds and implementation of the project would result in loss of nesting and foraging habitat	No effect	Same as B	Same as B	Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Potential Disturbance of Nesting Loggerhead Shrikes Resulting from Construction	No effect	Construction activities could disturb nesting birds	Same as B	Same as B	Same as B	Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary
Potential Disturbance of Nesting Tricolored Blackbirds Resulting from Construction	No effect	Construction activities could disturb nesting birds	Same as B	Same as B	Same as B	Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary
Potential Disturbance of Nesting Migratory Birds and Raptors Resulting from Construction	No effect	Construction activities could remove or disturb occupied nests	Same as B	Same as B	Same as B	Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary
Potential Disturbance to Nesting Swallows Resulting from Construction	No effect	Construction activities associated with bridge construction could result in loss of active nests	Same as B	Same as B	Same as B	Prevent Swallows from Nesting Adjacent to New Bridge Construction
Potential Disturbance to Roosting Bats Resulting from Construction	No effect	Construction could result in removal of bat roosting habitat and disturb roosting bats	Same as B	Same as B	Same as B	Conduct Preconstruction Surveys for Roosting Bats and Implement Protective Measures
River Lamprey						
Potential Effects on River Lamprey Resulting from Construction						
Water Quality Effects	No effect	Construction activities could result in sediments or contaminants entering streams	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel Restrict In-Water Work to

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
						Avoid Special-Status Fish Spawning Seasons
Habitat and Channel Morphology Effects	No effect	Construction in and adjacent to streams could affect channel morphology and streamside vegetation	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Minimize Impacts on Creek Channels
Water Temperature Effects	No effect	Minimal impact to water temperature from removal/addition of shading	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Minimize Impacts on Creek Channels
Interference with Movement	No effect	Dewatering activities associated with construction could interfere with fish movement	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons Provide Alternate Migration Corridor through Creek Channels
Disturbance and Direct Injury	No effect	Noise, vibration and other physical disturbances could disturb fish; direct injury could result during in-stream work	Same as B, but no effects at Suisun Creek	Same as B, but to a lesser extent due to less construction in the vicinity of Ledgewood Creek	Same as B, but no effects at Suisun Creek	Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons Provide Alternate Migration Corridor through Creek Channels Minimize Noise Impacts on Special-Status Fish Species
Potential Water Quality Effects on River Lamprey Associated with Operations	No effect	Increase in impervious surfaces could result in increase in pollutants entering streams	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Central Valley Fall-Run/Late-Fall-Run Chinook Salmon						
Potential Effects on Chinook Salmon Resulting from Construction						
Water Quality Effects	No effect	Construction activities could result in sediments or contaminants entering streams	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons
Habitat and Channel Morphology Effects	No effect	Construction in and adjacent to streams could affect channel morphology and streamside vegetation	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Minimize Impacts on Creek Channels
Water Temperature Effects	No effect	Minimal impact to water temperature from removal/addition of shading	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Minimize Impacts on Creek Channels
Interference with Movement	No effect	Dewatering activities associated with construction could interfere with fish movement	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons Provide Alternate Migration Corridor through Creek Channels

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Disturbance to Potential Spawning Habitat	No effect	Construction associated with the bridge over Suisun Creek could result in disturbance to spawning habitat located 20 feet downstream of bridge	No effect	Same a B	No effect	Minimize Impacts on Creek Channels Avoid Disturbance to Potential Fish Spawning Habitat or remove and replace gravels
Disturbance and Direct Injury	No effect	Noise, vibration and other physical disturbances could disturb fish; direct injury could result during in-stream work	Same as B, but no effects at Suisun Creek	Same as B, but to a lesser extent due to less construction in the vicinity of Ledgewood Creek	Same as B, but no effects at Suisun Creek	Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons Provide Alternate Migration Corridor through Creek Channels Minimize Noise Impacts on Special-Status Fish Species
Potential Water Quality Effects on Chinook Salmon Resulting from Operations	No effect	Increase in impervious surfaces could result in increase in pollutants entering streams	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel
Potential Interference with Fish Movement Resulting from Operations	No effect	Culvert extension in Ledgewood Creek under SR 12E would worsen fish passage conditions	Same as B	Same as B	Same as B	Implement Culvert Retrofit at the SR 12E Crossing on Ledgewood Creek
Sacramento Splittail						
Potential Water Quality Effects on Sacramento Splittail Resulting from Construction	No effect	Construction associated with bridges over Ledgewood Creek could result in sediments or contaminants entering the creek	Same as B, but to a lesser extent	Same as B, but to a lesser extent	Same as B, but to a lesser extent	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Potential Water Quality Effects on Sacramento Splittail Associated with Operations	No effect	Increase in impervious surfaces could result in increase in pollutants entering Ledgewood Creek	Same as B, but to a lesser extent	Same as B	Same as B, but to a lesser extent	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel
3.3.5—Threatened and Endangered Species						
Loss or Disturbance of Contra Costa Goldfields Resulting from Construction	No effect	Construction would result in the loss of 30 plants (this number may vary from year to year), and permanent loss of 55.95 acres and temporary disturbance of 14.02 acres of critical habitat	Construction would result in the permanent loss of 7.27 acres and temporary disturbance of 1.17 acres of critical habitat	Construction would result in the loss of 30 plants, and permanent loss of 39.59 acres and temporary disturbance of 8.55 acres of critical habitat	Construction would result in the permanent loss of 2.52 acres and temporary disturbance of 1.31 acre of critical habitat	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Compensate for the Loss of Contra Costa Goldfields Construct Retaining Wall on the South Side of SR 12E
Loss or Disturbance of Showy Indian Clover from Construction	No effect	Construction could affect potential habitat	No effect	Same as B	Same as B	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Conduct Protocol-level Surveys for Showy Indian Clover Avoid and Minimize Potential Direct and Indirect Disturbance of Populations of Showy Indian Clover
Potential Loss or Disturbance of Callippe Silverspot Butterfly Resulting from Construction	No effect	Construction would result in the permanent loss of 38.82 acres and temporary disturbance of 19.32 acres of habitat and could result in the loss of individuals	No effect	Same as B	Same as B	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Conduct Surveys for Larval Host Plants for Callippe Silverspot Butterfly Minimize Potential Direct and Indirect Disturbance of

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
						Populations of Callippe Silverspot Butterfly Compensate for Direct and Indirect Effects on Callippe Silverspot Butterfly Habitat
Potential Loss or Disturbance of Vernal Pool Fairy Shrimp/Vernal Pool Tadpole Shrimp Resulting from Construction	No effect	Construction would result in direct affect to 1.36 acres and indirect affect to 1.24 acres of potential habitat	Construction would result in direct affect to 0.20 acre and indirect affect to 0.04 acre of potential habitat	Construction would result in direct affect to 1.33 acres and indirect affect to 1.10 acres of potential habitat	Construction would result in direct affect to 1.45 acres and indirect affect to 0.26 acre of potential habitat	Protect Water Quality and Prevent Erosion and Sedimentation into Drainages and Wetlands Construct Retaining Wall on the South Side of SR 12E Avoid and Minimize Potential Indirect Disturbance of Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Habitat Compensate for Direct and Indirect Impacts on Vernal Pool Fairy Shrimp or Vernal Pool Tadpole Shrimp Habitat
Potential Loss of Valley Elderberry Longhorn Beetle Habitat Resulting from Construction	No effect	Construction would result in direct affects to 11 shrubs and indirect affects to 1 shrub	Construction would result in direct affects to 1 shrub, and no indirect affects.	Construction would result in direct affects to 10 shrubs and indirect affects to 1 shrub	Construction would result in direct affects to 10 shrubs and indirect affect 2 shrubs	Minimize Direct and Indirect Effects on Valley Elderberry Longhorn Beetle Compensate for Direct Effects on Valley Elderberry Longhorn Beetle Habitat
Potential Loss of California Red-legged Frog and its Habitat Resulting from Construction	No effect	Construction would result in permanent loss of 2.11 acres of aquatic habitat, 109.23 acres of upland habitat, and 18.24 acres of critical habitat and temporary disturbance of 2.16 acres of aquatic habitat, 37.58 acres of upland habitat and 1.98 acres of critical	Construction would result in permanent loss of 0.58 of aquatic habitat, and 21.09 acres of upland habitat, and temporary disturbance of 0.96 acre of aquatic habitat, and 0.74 acre of upland habitat. No critical habitat would be affected	Construction would result in permanent loss of 1.68 acres of aquatic habitat, 142.63 acres of upland habitat, and 22.89 acres of critical habitat and temporary disturbance of 1.25 acres of aquatic habitat, 12.99 acres of upland habitat and 0.13 acre of critical habitat	Construction would result in permanent loss of 2.86 acres of aquatic habitat, 78.48 acres of upland habitat, and 22.38 acres of critical habitat and temporary disturbance of 0 acre of aquatic habitat, 19.32 acres of upland habitat and 0.47 acre of critical habitat	Preconstruction Surveys and Monitor Construction Occurring near Potential California Red-Legged Frog Habitat Compensate for Loss and Disturbance of California Red-Legged Frog Habitat

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
		habitat				
Indirect Effects from Habitat Fragmentation and Vehicle-Related Mortality	No effect	Potential indirect effects of construction of road extension related to reduced migration opportunities and increased vehicle related mortality, but would be offset by design features of road extension.	No effect	Same as B	Same as B	None required
Potential Loss of CTS and its Habitat Resulting from Construction	No effect	Construction would result in the permanent loss of 23.06 acres of upland habitat and 6.21 acres of aquatic habitat and the temporary disturbance of 6.96 acres of upland habitat and 0.95 acre of aquatic habitat	Construction would result in the permanent loss of 0.49 acre of upland habit and no temporary disturbance; there would be no impact to aquatic habitat	Construction would result in the permanent loss of 12.58 acres of upland habitat and 4.47 acres of aquatic habitat and the temporary disturbance of 3.35 acres of upland habitat and 0.49 acre of aquatic habitat	Construction would result in the permanent loss of 0.76 acre of upland habit and no temporary disturbance; there would be no impact to aquatic habitat	Construct Retaining Wall on the South Side of SR 12E Avoid and Minimize Potential Disturbance of Riparian Communities Conduct Protocol-level Surveys for California Tiger Salamander Avoid and Minimize Potential Disturbance of California Tiger Salamander Habitat
Potential Loss of Swainson's Hawk Nesting and Foraging Habitat Resulting from Construction	No effect	Construction would result in the permanent loss of 231.52 acres of foraging habitat and 12.45 acres of potential nesting habitat and the temporary disturbance of 6.83 acres of potential nesting habitat	Construction would result in the permanent loss of 53.94 acres of foraging habitat and 5.40 acres of potential nesting habitat and the temporary disturbance of 0.59 acre of potential nesting habitat	Construction would result in the permanent loss of 224.60 acres of foraging habitat and 21.42 acres of potential nesting habitat and the temporary disturbance of 7.17 acres of potential nesting habitat	Construction would result in the permanent loss of 169.64 acres of foraging habitat and 15.94 acres of potential nesting habitat and the temporary disturbance of 3.07 acres of potential nesting habitat	Conduct Preconstruction Nesting Bird and Raptor Surveys and Establish a No-Disturbance Buffer, if Necessary Compensate for Loss of Swainson's Hawk Foraging Habitat

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Central California Coast Steelhead						
Potential Effects on Steelhead Resulting from Construction						
Water Quality Effects	No effect	Construction activities could result in sediments or contaminants entering streams	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons
Steelhead Habitat and Channel Morphology	No effect	Construction in and adjacent to streams could affect channel morphology and streamside vegetation	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Minimize Impacts on Creek Channels
Water Temperature Effects	No effect	Minimal impact to water temperature from removal/addition of shading	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Minimize Impacts on Creek Channels
Interference with Steelhead Movement	No effect	Dewatering activities associated with construction could interfere with fish movement	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons Provide Alternate Migration Corridor through Creek Channels

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
Disturbance to Potential Spawning Habitat	No effect	Construction associated with the bridge over Suisun Creek could result in disturbance to spawning habitat located 20 feet downstream of bridge	No effect	Same a B	No effect	Minimize Impacts on Creek Channels Avoid Potential Fish Spawning Habitat
Disturbance and Direct Injury to Steelhead	No effect	Noise, vibration and other physical disturbances could disturb fish; direct injury could result during in-stream work	Same as B, but no effects at Suisun Creek	Same as B, but to a lesser extent due to less construction in the vicinity of Ledgewood Creek	Same as B, but no effects at Suisun Creek	Restrict In-Water Work to Avoid Special-Status Fish Spawning Seasons Provide Alternate Migration Corridor through Creek Channels Minimize Noise Impacts on Special-Status Fish Species
Potential Water Quality Effects on Steelhead Resulting from Operations	No effect	Increase in impervious surfaces could result in increase in pollutants entering streams	Same as B, but no effects at Suisun Creek	Same as B	Same as B, but no effects at Suisun Creek	Prepare and Implement Storm Water Pollution Prevention Plan and Best Management Practices Prevent Contaminants and Hazardous Materials from Entering the Stream Channel
Potential Interference with Fish Movement Resulting from Operations	No effect	Culvert extension in Ledgewood Creek under SR 12E would worsen fish passage conditions	Same as B	Same as B	Same as B	Implement Culvert Retrofit at the SR 12 Crossing on Ledgewood Creek
3.3.6—Invasive Species						
Potential Introduction and Spread of Invasive Plant Species Resulting from Construction	No effect	Construction activities have the potential to spread invasive plant species	Same as B	Same as B	Same as B	Avoid the Introduction and Spread of Invasive Plants—Minimize Soil Disturbance, Restore Disturbed Areas Using Native Species

Table S-1. Continued

Impact	No Build	Alternative B		Alternative C		Avoidance, Minimization, and/or Mitigation Measures
		Full Build	Phase 1	Full Build	Phase 1	
3.3.7—Native Trees						
Removal of Native Trees	No effect	Loss of 8 mature native oak trees	Loss of 6 mature native oak trees	Loss of 6 mature native oak trees	Loss of 4 mature native oak trees	Avoid and Minimize Potential Disturbance of Riparian Communities Compensate for Temporary and Permanent Loss of Riparian Vegetation
3.3.8—Suisun Marsh Secondary Management Area						
None						

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Table of Contents

Page

Summary i

Chapter 1 **Proposed Project** 1-1
1.1 Introduction 1-1
1.2 Purpose and Need 1-2
1.2.1 Purpose of the Proposed Project 1-2
1.2.2 Need for the Proposed Project 1-3

Chapter 2 **Project Alternatives** 2-1
2.1 Project Description 2-1
2.2 Approach to Alternatives 2-1
2.2.1 Scope of Alternatives in this EIR/EIS 2-1
2.2.2 Alternatives Analyzed in the EIR/EIS 2-2
2.3 Project Alternatives 2-5
2.3.1 Features Common to Alternatives (Alternatives B and C) 2-5
2.3.2 Unique Features of Alternative B 2-9
2.3.3 Unique Features of Alternative C 2-11
2.3.4 Unique Features of Alternative B, Phase 1 2-13
2.3.5 Unique Features of Alternative C, Phase 1 2-15
2.3.6 Transportation System Management and Transportation Demand Management Alternatives 2-18
2.4 Comparison of Build Alternatives 2-20
2.5 Identification of the Preferred Alternative 2-21
2.5.1 Conclusion 2-24
2.6 Alternatives Considered but Eliminated from Further Discussion Prior to the Draft EIR/EIS 2-24
2.6.1 Overview of Alternatives Screening Process 2-24
2.6.2 First-Level Screening and Alternatives Eliminated 2-24
2.6.3 Second-Level Screening and Alternatives Eliminated 2-28
2.7 Permits and Approvals Needed 2-30
2.8 Project Cost, Funding and Schedule 2-31
2.8.1 Cost 2-31
2.8.2 Funding 2-31
2.8.3 Schedule 2-32

Chapter 3 **Affected Environment; Environmental Consequences; and Avoidance, Minimization, and/or Mitigation Measures** 3-1
3.1 Human Environment 3.1.1-1
3.1.1 Land Use 3.1.1-1
3.1.2 Growth 3.1.2-1
3.1.3 Farmlands 3.1.3-1
3.1.4 Community Impacts 3.1.4-1
3.1.5 Utilities and Emergency Services 3.1.5-1
3.1.6 Traffic and Transportation/Pedestrian and Bicycle Facilities 3.1.6-1
3.1.7 Visual and Aesthetic Resources 3.1.7-1
3.1.8 Cultural Resources 3.1.8-1

3.2 Physical Environment 3.2.1-1
3.2.1 Hydrology and Floodplain 3.2.1-1
3.2.2 Water Quality and Stormwater Runoff 3.2.2-1
3.2.3 Geology/Soils/Seismic/Topography 3.2.3-1
3.2.4 Paleontology 3.2.4-1
3.2.5 Hazardous Waste/Materials 3.2.5-1
3.2.6 Air Quality 3.2.6-1
3.2.7 Noise 3.2.7-1
3.2.8 Energy 3.2.8-1
3.3 Biological Environment 3.3-1
3.3.1 Natural Communities 3.3-2
3.3.2 Wetlands and Other Waters 3.3-11
3.3.3 Plant Species 3.3-37
3.3.4 Animal Species 3.3-45
3.3.5 Threatened and Endangered Species 3.3-73
3.3.6 Invasive Species 3.3-134
3.3.7 Native Trees 3.3-137
3.3.8 Suisun Marsh Secondary Management Area 3.3-138
3.4 Relationship between Local Short-Term Uses of the Human Environment and the Maintenance of Long-Term Productivity 3.4-1
3.4.1 Build Alternatives 3.4-1
3.4.2 No-Build Alternative 3.4-2
3.5 Irreversible and Irretrievable Commitments of Resources 3.5-1
3.6 Cumulative Impacts 3.6-1
3.6.1 Regulatory Setting 3.6-1
3.6.2 Approach to Cumulative Impact Analysis 3.6-1
3.6.3 Assessment of Cumulative Impacts 3.6-4

Chapter 4 California Environmental Quality Act (CEQA) Evaluation 4-1
4.1 Determining Significance under CEQA 4-1
4.2 Discussion of Significance of Impacts 4-1
4.2.1 Less-than-Significant Effects of the Proposed Project 4-3
4.2.2 Less than Significant with Mitigation Environmental Effects of the Proposed Project 4-25
4.2.3 Significant Irreversible Environmental Changes 4-26
4.2.4 Growth-Inducing Impacts 4-26
4.2.5 Climate Change 4-26
4.2.6 Mitigation Measures for Significant Impacts under CEQA 4-42

Chapter 5 Comments and Coordination 5-1
5.1 Scoping Process 5-1
5.1.1 Notice of Intent/Notice of Preparation 5-1
5.1.2 NOP Scoping Meeting 5-2
5.2 NEPA/404 Integration 5-2
5.3 Consultation and Coordination with Public Agencies 5-3
5.4 Public Participation 5-5
5.4.1 Project Outreach Meetings 5-5
5.4.2 Related Projects 5-5
5.4.3 Project Newsletter 5-6
5.4.4 Business Outreach 5-7
5.4.5 Public Meeting 5-7
5.5 Public Comments on Draft EIR/EIS and Responses 5-8

Chapter 6 **References Cited.....6-1**

Chapter 7 **List of Preparers 7-1**
7.1 Solano Transportation Authority 7-1
7.2 Design 7-1
7.3 Environmental Document 7-1

Chapter 8 **Distribution List 8-1**

Appendix A CEQA Environmental Checklist
Appendix B Resources Evaluated Relative to the Requirements of Section 4(f)
Appendix C Title VI Policy Statement
Appendix D Summary of Relocation Benefits
Appendix E Farmlands Documentation
Appendix F Threatened and Endangered Species List
Appendix G Native Trees Mapped in the Study Area
Appendix H Agency Consultation
Appendix I Property Impacts
Appendix J Environmental Commitment Record
Appendix K Glossary
Appendix L Responses to Comments

List of Technical Studies

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List of Tables

Page

Table S-1. Comparison of Alternatives ix
Table 1-1. Project Funding Sources (dollars in millions and escalated) 1-1
Table 1-2. Accident History, January 1, 2006 to December 31, 2008 1-8
Table 2-1. Required CEQA and NEPA Approvals 2-3
Table 2-2. Phase 1 of Alternatives Addressing Key Project Purpose and Need 2-4
Table 2-3. Required Permits, Approvals and Consultation 2-30
Table 2-4. Construction Cost Estimate Summary 2-31
Table 2-5. Project Funding Sources (dollars in millions and escalated) 2-32
Table 3.1.1-1. Current and Planned Development Projects as of April 2009—City of Fairfield 3.1.1-3
Table 3.1.1-2. Current and Planned Development Projects as of April 2009—Suisun City 3.1.1-8
Table 3.1.2-1. Regional and Local Population—2000 through 2035 ..... 3.1.2-1
Table 3.1.2-2. Housing Characteristics in 2000 ..... 3.1.2-2
Table 3.1.2-3. Number of Regional and Local Households—2000 through 2035 ..... 3.1.2-2
Table 3.1.2-4. Growth-Inducement Checklist 3.1.2-3
Table 3.1.3-1. Historical Agricultural Conversion in Solano County, 1984–2006 ..... 3.1.3-6
Table 3.1.3-2. Affected Williamson Act Lands 3.1.3-7
Table 3.1.3-3. Conservation Easements in the Project Area 3.1.3-7
Table 3.1.3-4. Impacted Agricultural Parcels 3.1.3-8
Table 3.1.4-1. Alternative B Displaced Businesses 3.1.4-7
Table 3.1.4-2. Alternative B, Phase 1 Displaced Businesses 3.1.4-9
Table 3.1.4-3. Alternative C Displaced Businesses 3.1.4-10
Table 3.1.4-4. Alternative C, Phase 1 Displaced Businesses 3.1.4-11
Table 3.1.4-5. Project Area Housing Characteristics in 2000 ..... 3.1.4-15
Table 3.1.4-6. Project Area Racial Characteristics in 2000 ..... 3.1.4-16
Table 3.1.4-7. Project Area Income and Poverty in 2000 ..... 3.1.4-17
Table 3.1.6-1. Freeway Mainline, Weaving, and Ramp Junction LOS Criteria 3.1.6-2
Table 3.1.6-2. Intersection LOS Definitions for Highway Capacity Manual Methodology 3.1.6-3
Table 3.1.6-3. Existing (Year 2004) System-Wide Measures of Effectiveness 3.1.6-5
Table 3.1.6-4. Accident History, January 1, 2006 to December 31, 2008 ..... 3.1.6-9
Table 3.1.6-5. Existing Bus Routes in Project Study Area 3.1.6-12
Table 3.1.6-6. Construction-Year 2015—A.M. Peak Hour Conditions System Wide Measures of Effectiveness 3.1.6-15

Table 3.1.6-7. Construction-Year 2015—P.M. Peak Hour Conditions System Wide Measures of Effectiveness 3.1.6-16
Table 3.1.6-8. Design-Year 2035—AM Peak Hour Conditions System Wide Measures of Effectiveness 3.1.6-17
Table 3.1.6-9. Design-Year 2035—P.M. Peak Hour Conditions System Wide Measures of Effectiveness 3.1.6-19
Table 3.1.6-10. Design-Year 2035—Peak Hour Travel Times 3.1.6-21
Table 3.1.6-11. Construction-Year 2015—Peak Hour Travel Times 3.1.6-21
Table 3.1.6-12. Alternative C Phase 1 Travel Times PM Peak Hour, 2025 and 2035 ..... 3.1.6-29
Table 3.1.6-13. Alternative C Phase 1 Travel Times PM Peak Hour, 2025 and 2035 ..... 3.1.6-38
Table 3.1.7-1. Vividness, Intactness, and Unity Scoring System 3.1.7-2
Table 3.1.7-2. Visual Quality in Landscape Unit 1 ..... 3.1.7-5
Table 3.1.7-3. Visual Quality in Landscape Unit 2 ..... 3.1.7-6
Table 3.1.7-4. Visual Quality in Landscape Unit 3 ..... 3.1.7-7
Table 3.1.7-5. Visual Quality in Landscape Unit 4 ..... 3.1.7-8
Table 3.1.7-6. Visual Quality in Landscape Unit 5 ..... 3.1.7-8
Table 3.1.7-7. Summary of Change to Visual Quality Scores 3.1.7-12
Table 3.2.1-1. Minimum, Mean and Maximum Monthly Precipitation from August 1994 to February 2010 in Suisun Valley (Station No. 123) 3.2.1-2
Table 3.2.1-2. Floodplain Summary Table 3.2.1-7
Table 3.2.2-1. Known Roadway Pollutants 3.2.2-6
Table 3.2.2-2. Soils in the Project Area 3.2.2-7
Table 3.2.2-3. Acreage of Impervious Surfaces 3.2.2-7
Table 3.2.3-1. Subsurface Geologic Units for the Project Area 3.2.3-6
Table 3.2.3-2. Characteristics of Local Faults[a] 3.2.3-9
Table 3.2.3-3. Underlying Native Soil Map Unit Characteristics of the Project Area 3.2.3-11
Table 3.2.4-1. Society of Vertebrate Paleontology's Definitions of Sensitivity Categories and Recommended Treatment for Paleontological Resources 3.2.4-3
Table 3.2.4-2. Preliminary Summary of Paleontological Resource Sensitivity for Geologic Units in the I-80/I-680/SR 12 Interchange Project Area 3.2.4-5
Table 3.2.4-3. Comparison of Paleontological Impacts by Alternative 3.2.4-8
Table 3.2.5-2. LUST and SLIC Properties 3.2.5-6
Table 3.2.5-1. Summary of Identified Potential Hazardous Waste Facilities and Recommendations 3.2.5-13
Table 3.2.6-1. Federal and State Ambient Air Quality Standards 3.2.6-4
Table 3.2.6-2. Ambient Air Quality Monitoring Data Measured at the Fairfield at Chadbourne Road and of Vallejo at Tuolumne Street Monitoring Stations 3.2.6-7

Table 3.2.6-3. Modeled Carbon Monoxide Levels Measured at Receptors in the Vicinity of the Project Area (Intersections) 3.2.6-15
Table 3.2.6-4. Modeled Carbon Monoxide Levels Measured at Receptors in the Vicinity of the Project Area (Segments) 3.2.6-17
Table 3.2.6-5. Criteria Pollutant, MSAT, and CO_2 Modeling Peak Period Traffic Data Inputs 3.2.6-19
Table 3.2.6-6. Criteria Pollutant, MSAT, and CO_2 Modeling Non-Peak Period Traffic Data Inputs 3.2.6-20
Table 3.2.6-7. I-80/I-680/SR 12 MSAT Emissions (pounds per day) 3.2.6-21
Table 3.2.6-8. I-80/I-680/SR 12 Project-Related Emissions (pounds per day) 3.2.6-23
Table 3.2.6-9. Worst-Case Construction Emission Estimates (pounds per day) 3.2.6-26
Table 3.2.6-10. Feasible Control Measures for Construction Emissions of PM10 ..... 3.2.6-29
Table 3.2.7-1. Activity Categories and Noise Abatement Criteria 3.2.7-1
Table 3.2.7-2. Typical A-Weighted Noise Levels 3.2.7-2
Table 3.2.7-3. Summary of Short-Term Noise Monitoring 3.2.7-6
Table 3.2.7-4. Traffic Noise Impact Evaluation, I-80, I-680, and SR 12 ..... 3.2.7-9
Table 3.2.7-5. Counts of Affected Residences, Alternative B, and Alternative B, Phase 1 ..... 3.2.7-11
Table 3.2.7-6. Counts of Affected Residences, Alternative C and Alternative C, Phase 1 ..... 3.2.7-11
Table 3.2.7-7. Construction Equipment Noise 3.2.7-12
Table 3.2.7-8. Summary of Reasonableness Determination Data—Barrier E-2, Ramsey Road 3.2.7-14
Table 3.2.7-9. Summary of Reasonableness Determination Data—Barrier E-3, Ramsey Road 3.2.7-15
Table 3.2.7-10. Summary of Reasonableness Determination Data—Barrier H-1, Marquette Way 3.2.7-16
Table 3.2.7-11. Summary of Reasonableness Determination Data—Barrier O, Hale Ranch Road 3.2.7-17
Table 3.2.7-12. Summary of Reasonableness Determination Data—Barrier R, Pittman Road 3.2.7-18
Table 3.2.7-13. Summary of Reasonableness Allowances and Cost Estimates for Evaluated Noise Barrier Designs 3.2.7-19
Table 3.2.8-1. Traffic Flow during Operations in Year 2015 and Ranking of Alternatives (score in parenthesis) 3.2.8-4
Table 3.2.8-2. Traffic Flow during Operations in Year 2035 and Ranking of Alternatives (score in parentheses) 3.2.8-5
Table 3.2.8-3. Materials Consumption for Construction and Maintenance and Ranking of Alternatives (score in parentheses) 3.2.8-7
Table 3.3.1-1. Summary of Impacts on Sensitive Communities by Project Alternative 3.3-4
Table 3.3.2-1. Direct Impacts on Drainages in the Study Area under Alternative B 3.3-14

Table 3.3.2-2. Direct Impacts on Drainages in the Study Area under Alternative B, Phase 1 ..... 3.3-15
Table 3.3.2-3. Direct Impacts on Drainages in the Study Area under Alternative C 3.3-15
Table 3.3.2-4. Direct Impacts on Drainages in the Study Area under Alternative C, Phase 1 ..... 3.3-16
Table 3.3.3-1. Sensitive Plant Species with the Potential to Occur in the I-80/I-680/SR 12 Project Region 3.3-140
Table 3.3.3-2. Summary of Sensitive Plant Species and Native Tree Impacts by Project Alternative 3.3-38
Table 3.3.4-1. Special-Status Wildlife and Fish Species with the Potential to Occur in the I-80/I-680/SR-12 Project Region 3.3-151
Table 3.3.4-2a. Summary of Special-Status Wildlife Species Potential Impacts by Project Alternative 3.3-46
Table 3.3.4-2b. Summary of Special-Status Fish Species with Potential for Impacts by Project Alternative 3.3-47
Table 3.3.5-1. Callippe Silverspot Butterfly Habitat Compensation 3.3-93
Table 3.3.5-2. Direct and Indirect Impacts on Vernal Pool Fairy and Tadpole Shrimp in the Study Area under Alternative B 3.3-98
Table 3.3.5-3. Direct and Indirect Impacts on Vernal Pool Fairy and Tadpole Shrimp under Alternative B, Phase 1 ..... 3.3-98
Table 3.3.5-4. Direct and Indirect Impacts on Vernal Pool Fairy and Tadpole Shrimp under Alternative C 3.3-99
Table 3.3.5-5. Direct and Indirect Impacts on Vernal Pool Fairy and Tadpole Shrimp under Alternative C, Phase 1 ..... 3.3-100
Table 3.3.5-6. Vernal Pool Fairy Shrimp and Vernal Pool Tadpoles Shrimp Compensation 3.3-101
Table 3.3.5-7. Summary of Stem Counts for All Elderberry Shrubs In the Study Area 3.3-102
Table 3.3.5-8. Summary of Elderberry Shrub Effects under Alternative B 3.3-104
Table 3.3.5-9. Summary of Elderberry Shrub Effects under Alternative B, Phase 1 ..... 3.3-105
Table 3.3.5-10. Summary of Elderberry Shrub Effects under Alternative C 3.3-105
Table 3.3.5-11. Summary of Elderberry Shrub Effects under Alternative C, Phase 1 ..... 3.3-106
Table 3.3.5-12. USFWS-Approved Compensation Ratios for VELB Habitat 3.3-107
Table 3.3.5-13. Affected Elderberry Plant Minimization Ratios Based on Location, Stem Diameter, and Presence of Exit Holes under Alternative B 3.3-108
Table 3.3.5-14. Affected Elderberry Plant Minimization Ratios Based on Location, Stem Diameter, and Presence of Exit Holes under Alternative B, Phase 1 ..... 3.3-108
Table 3.3.5-15. Affected Elderberry Plant Minimization Ratios Based on Location, Stem Diameter, and Presence of Exit Holes under Alternative C 3.3-109
Table 3.3.5-16. Affected Elderberry Plant Minimization Ratios Based on Location, Stem Diameter, and Presence of Exit Holes under Alternative C, Phase 1 ..... 3.3-109

Table 3.3.5-17. California Red-legged Frog Compensation 3.3-121
Table 3.3.6-1. Invasive Plant Species Identified in the Study Area 3.3-135
Table 4-1. Summary of Impact Determinations under CEQA 4-2
Table 4-2. Project-Related Operational VMT (vehicle miles traveled per day) and GHG Emissions (metric tons per year) 4-31
Table 4-3. National Highway Traffic Safety Administration Model Year 2015 Required Miles Per Gallon by Alternative 4-34
Table 4-4. Climate Change/CO_2 Reduction Strategies 4-39
Table 4-5. Significant Impacts and Mitigation Measures Specific to CEQA 4-42
Table 5-1. List of Individuals, Organizations, and Agencies Commenting on the Draft EIR/EIS 5-8

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List of Figures

Except where otherwise noted, figures appear at the end of the chapter/section in which they are referenced

Figure 1-1	Project Location
Figure 2-1	Project Area Map
Figure 2-1a	Project Area Map – Western Segment
Figure 2-1b	Project Area Map – Central Segment
Figure 2-1c	Project Area Map – Eastern Segment
Figure 2-2	Alternative B Project Features
Figure 2-3	Alternative C Project Features
Figure 2-4	Alternative B Phase 1 Features
Figure 2-5	Alternative C Phase 1 Features
Figure 3.1.1-1	Section 4(f) Resources in the Project Vicinity
Figure 3.1.3-1	Lands under Williamson Contract and Conservation Easements
Figure 3.1.3-2	Alternative B: Impacted Agricultural Parcels
Figure 3.1.3-3	Alternative C: Impacted Agricultural Parcels
Figure 3.1.4-1	Alternative B Building Displacements
Figure 3.1.4-2	Alternative C Building Displacements
Figure 3.1.4-3	Census Tract Block Groups
Figure 3.1.6-1	Existing Year 2004 AM Peak Hour Travel Speeds
Figure 3.1.6-2	Existing Year 2004 PM Peak Hour Travel Speeds
Figure 3.1.6-3	Existing Year 2007 PM Peak Hour Travel Speeds
Figure 3.1.6-4	Existing and Planned Bicycle/Trails System
Figure 3.1.6-5	Existing Transit System
Figure 3.1.6-6	System-Wide AM Measures of Effectiveness
Figure 3.1.6-7	System-Wide PM Measures of Effectiveness
Figure 3.1.7-1	Project Viewshed
Figure 3.1.7-2	Landscape Units
Figure 3.1.7-3	Project Viewpoints
Figure 3.1.7-4	Viewpoint 1, Alternative B
Figure 3.1.7-5	Viewpoint 2, Alternative B
Figure 3.1.7-6	Viewpoint 3, Alternative B
Figure 3.1.7-7	Viewpoint 4, Alternative B
Figure 3.1.7-8	Viewpoint 5, Alternatives B and C
Figure 3.1.7-9	Viewpoint 6, Alternative B
Figure 3.1.7-10	Viewpoint 7, Alternative B
Figure 3.1.7-11	Viewpoint 8, Alternative B
Figure 3.1.7-12	Viewpoint 9, Alternative B
Figure 3.1.7-13	Viewpoint 10, Alternative B
Figure 3.1.7-14	Viewpoint 11, Alternative B
Figure 3.1.7-15	Viewpoint 12, Alternatives B and C
Figure 3.1.7-16	Viewpoint 13, Alternatives B and C
Figure 3.1.7-17	Viewpoint 14, Alternative B
Figure 3.1.7-18	Viewpoint 1, Alternative C
Figure 3.1.7-19	Viewpoint 2, Alternative C
Figure 3.1.7-20	Viewpoint 3, Alternative C
Figure 3.1.7-21	Viewpoint 4, Alternative C
Figure 3.1.7-22	Viewpoint 6, Alternative C
Figure 3.1.7-23	Viewpoint 7, Alternative C

Figure 3.1.7-24 Viewpoint 8, Alternative C
Figure 3.1.7-25 Viewpoint 9, Alternative C
Figure 3.1.7-26 Viewpoint 10, Alternative C
Figure 3.1.7-27 Viewpoint 11, Alternative C
Figure 3.1.8-1 Area of Potential Effect Overview
Figure 3.1.8-2 Cordelia Historic District
Figure 3.1.8-3 Suisun City Historic District
Figure 3.2.1-1 100-Year Floodplains
Figure 3.2.1-2 100-Year Floodplains
Figure 3.2.1-3 100-Year Floodplains
Figure 3.2.1-4 100-Year Floodplains
Figure 3.2.1-5 100-Year Floodplains
Figure 3.2.1-6 100-Year Floodplains
Figure 3.2.1-7 100-Year Floodplains
Figure 3.2.3-1 Geologic Map of the Project Vicinity
Figure 3.2.4-1 Paleontological Sensitivity Map of the Project Area
Figure 3.2.4-2 Index to Paleontological Sensitivity Figures
Figure 3.2.4-3a Alternative B Paleontological Sensitivity and Bridges
Figure 3.2.4-3b Alternative B Paleontological Sensitivity and Bridges
Figure 3.2.4-4a Alternative C Paleontological Sensitivity and Bridges
Figure 3.2.4-4b Alternative C Paleontological Sensitivity and Bridges
Figure 3.2.5-1 Potential Hazardous Facility Locations
Figure 3.2.5-2 Potential Hazardous Facility Locations
Figure 3.2.5-3 Potential Hazardous Facility Locations
Figure 3.2.5-4 Potential Hazardous Facility Locations
Figure 3.2.5-5 Potential Hazardous Facility Locations
Figure 3.2.5-6 Potential Hazardous Facility Locations
Figure 3.2.5-7 Potential Hazardous Facility Locations
Figure 3.2.5-8 Potential Hazardous Facility Locations
Figure 3.2.5-9 Potential Hazardous Facility Locations
Figure 3.2.6-1 Predominant Wind Direction at Travis Air Force Base
Figure 3.2.6-2 Project Area Map and General Locations of Sensitive Receptors
Figure 3.2.6-3 National MSAT Emission Trends 1999–2050 for Vehicle Operating on Roadways Using EPA's Mobile6.2 Model
Figure 3.2.6-4 Summary of Project Level Acrolein Emissions (pounds per day)
Figure 3.2.6-5 Summary of Project Level Acetaldehyde Emissions (pounds per day)
Figure 3.2.6-6 Summary of Project Level Benzene Emissions (pounds per day)
Figure 3.2.6-7 Summary of Project Level 1,3-Butadiene Emissions (pounds per day)
Figure 3.2.6-8 Summary of Project Level Diesel Particulate Matter Emissions (pounds per day)
Figure 3.2.6-9 Summary of Project Level Formaldehyde Emissions (pounds per day)
Figure 4-1 California Greenhouse Gas Forecast ..... on page 4-30
Figure 4-2 Cascade of Uncertainties ..... on page 4-35
Figure 4-3 Mobility Pyramid ..... on page 4-37

Noise and Biological Resources Figures are bound separately as Volume 2

Figure 3.2.7-1	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-2	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-3	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-4	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-5	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-6	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-7	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-8	Alternative B and Alternative B, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-9	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-10	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-11	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-12	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-13	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-14	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-15	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-16	Alternative C and Alternative C, Phase 1 Existing Conditions and Measurement Sites
Figure 3.2.7-17	Locations of Evaluated Noise Barriers
Figure 3.2.7-18	Locations of Evaluated Noise Barriers
Figure 3.2.7-19	Locations of Evaluated Noise Barriers
Figure 3.2.7-20	Locations of Evaluated Noise Barriers
Figure 3.3-1	Natural Communities of Special Concern in the Study Area
Figure 3.3-2a	Biological Resources Alternative B
Figure 3.3-2b	Biological Resources Alternative B, Phase 1
Figure 3.3-2c	Biological Resources Alternative C
Figure 3.3-2d	Biological Resources Alternative C, Phase 1
Figure 3.3-3a	Distribution of Federally Listed Plant Species Within The Project Vicinity
Figure 3.3-3b	Distribution of Federally Listed Animal Species Within The Project Vicinity
Figure 3.3-4a	Resources for California Red-legged Frog Alternative B
Figure 3.3-4b	Resources for California Red-legged Frog Alternative B, Phase 1
Figure 3.3-4c	Resources for California Red-legged Frog Alternative C
Figure 3.3-4d	Resources for California Red-legged Frog Alternative C, Phase 1
Figure 3.3-5	California Red-Legged Frog Critical Habitat
Figure 3.3-6	Contra Costa Goldfields Critical Habitat
Figure 3.3-7	Known Locations and Approximate Range of Callippe Silverspot Butterfly
Figure 3.3-8	Proposed Locations for California Red-Legged Frog Permanent Exclusion Fence and Undercrossings
Figure 3.3-9	Surveyed Areas and Documented Occurrences of California Tiger Salamander
Figure 3.3-10	Potential California Tiger Salamander Breeding and Upland Habitat

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List of Abbreviated Terms

AB 1493	Assembly Bill 1493
AB 32	Assembly Bill 32
ABAG	Association of Bay Area Governments
AC	asphalt concrete
ACCM	asbestos-containing construction material
ACOE	U.S. Army Corps of Engineers
ADA	1990 Americans with Disabilities Act
ADL	Aerially deposited lead
Air Quality Study Report	Interstate 80/Interstate 680/State Route 12 Interchange Project Air Quality Study Report
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
APE	Area of Potential Effects
APN	Assessor's Parcel Number
ARS	Acceleration Response Spectrum
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
basin plan	*Water Quality Control Plan for the San Francisco Bay Basin*
BAT/BCT	Best Available Technology economically achievable/Best Conventional Pollutant Control Technology
BCDC	Bay Conservation and Development Commission
BMP	Best Management Practice
BOD	biochemical oxygen demand
BTU	British thermal unit
$CaCO_3$	calcium carbonate
CAFÉ	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBSC	California Building Standards Code
CCJPA	Capitol Corridor Joint Powers Authority
CDFG	California Department of Fish and Game
CeA	Clear Lake clay
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFPD	Cordelia Fire Protection District
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH4	methane
CHP	California Highway Patrol
CIA	Community Impact Assessment
CIMIS	California Irrigation Management System
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Co	Conejo gravelly loam
CO	carbon monoxide
CO_2	carbon dioxide
COD	chemical oxygen demand
CRHR	California Register of Historic Resources
CRLF	California red-legged frog
CTP	Comprehensive Transportation Plan

CTP 2030	STA's Comprehensive Transportation Plan
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
dBA	A-weighted decibels
dbh	diameter at breast height
Department	California Department of Transportation
DFG	California Department of Fish and Game
difluoroethane	HFC-152a
DTSC	California Department of Toxic Substances Control
DSA	Disturbed Soil Area
DWR	State Department of Water Resources
EB	eastbound
ECR	Environmental Commitments Record
EDR	Environmental Data Resources
EFH	Essential Fish Habitat
EIR/EIS	environmental impact report/environmental impact statement
Energy Report	Interstate 80/Interstate 680/State Route 12 Energy Technical Report
EO	Executive Order
EOA	Engineering and Operational Acceptability
EOP	edge of pavement
EPA	U.S. Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	environmentally sensitive area
ESU	evolutionarily significant unit
Farmland	Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
FAST	Fairfield and Suisun Transit
FCVs	fuel cell vehicles
FDHA	fault displacement hazard
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FINDS	Facility Index System
FIRMs	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
FSSD	Fairfield-Suisun Sewer District
FSUSD	Fairfield-Suisun Unified School District
FTA	Federal Transportation Administration
FTOR	Final Traffic Operations Report
GHG	greenhouse gas
GO	General Order
GSRD	gross solids removal device
HAP	hazardous air pollutant
HCP	Habitat Conservation Plan
HDM	Highway Design Manual
HFC-134a	1, 1, 1, 2 –tetrafluoroethane
HFC-23	fluoroform
HFC	hydrofluorocarbon
HOV	high-occupancy vehicle
HPTP	Historic Properties Treatment Plan
HWCA	Hazardous Waste Control Act

I-680	Interstate 680
I-80	Interstate 80
IAC	interagency consultation
IBC	International Building Code
IGR	Intergovernmental Review
IPCC	Intergovernmental Panel on Climate Change
IRIS	Integrated Risk Information System
ISA	initial site assessment
ITS	Intelligent Trans. System
JPC	Joint Policy Committee
kV	kilovolt
Land Evaluation and Site Assessment or LESA form	Federal AD-1006 Farmland Conversion Impact Rating Form
LCP	Lead-containing paint
LEDPA	least environmentally damaging practicable alternative
LHS	Location Hydraulic Study & Summary Floodplain Encroachment Report
LOP	Local Oversight Program
LOS	level of service
LUST	leaking underground storage tank
mg/l	milligrams per liter
Mgd	million gallons per day
MIS	Major Investment Study
MLD	most likely descendent
MOE	measures of effectiveness
MOU	memorandum of understanding
mph	miles per hour
MS4	Municipal Separate Storm Sewer System
MSA	Metropolitan Statistical Area
MTC	Metropolitan Transportation Commission
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	noise abatement criteria
NADR	Noise Abatement Decision Report
NB	northbound
NBA	North Bay Aqueduct
NEPA	National Environmental Policy Act
NEPA/404 MOU	Memorandum of Understanding – National Environmental Policy Act and Clean Water Act Section 404 Integration Process for Surface Transportation Projects in Arizona, California, and Nevada
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act of 1966, as amended,
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NOAA's NMFS	National Oceanic and Atmospheric Administration's National Marine Fisheries Service
NOC	Notice of Construction
NOCC	Notice of Completion of Construction
NOD	notice of determination
NOI	Notice of Intent
Noise Study	Noise Study Technical Report for the Interstate 80/Interstate 680/State Route 12 Interchange Project
NOP	notice of preparation

NOT	Notice of Termination
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSIC	National Invasive Species Council
NWIC	Northwest Information Center
O_3	ozone
OHWM	ordinary high water mark
OSHA	Occupational Safety and Health Act
OSR	open space recreation
PA	Programmatic Agreement
Pb	lead
PCB	polychlorinated biphenyl
PCC	Portland cement concrete
PCE	Primary Constituent Elements
PDT	project development team
PF	public facility
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric Company
PID	Project Initiation Document
PM	particulate matter
POAQC	project of air quality concern
PRC	California Public Resources Code
proposed project	I-80/I-680/SR 12 Interchange Project
PUC	Public Utilities Commission
RAP	Relocation Assistance Program
RCP	reinforced concrete pipe
RCRA	Resource Conservation and Recovery Act of 1976
Resources Agency	Natural Resources Agency
ROD	record of decision
RP	Responsible Party
RSP	rock slope protection
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SAA	streambed alteration agreement
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SB	southbound
SCR	Senate Concurrent Resolution
SCWA	Solano County Water Agency
SF6	hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFPD	Suisun Fire Protection District
SHOPP	State Highway Operation and Protection Program
SHPO	State Historic Preservation Officer
SID	Solano Irrigation District
SIP	State Implementation Plan
SLIC	Spills, Leaks, Investigation, and Cleanup
SMA	Secondary Management Area
SMLPP	Suisun Marsh Local Protection Program
SNCI	Solano Napa Commuter Information
SO_2	sulfur dioxide
SQG and LQG	Small and Large Quantity Generator

Sr	Sycamore silty clay loam
SR 12	State Route 12
SR 12E	SR 12 East
SR 12W	SR 12 West
SRA	shaded riverine aquatic
SSWA	Suisun Solano Water Agency
STA	Solano Transportation Authority
STLC	soluble threshold limit concentration
SVP	Society of Vertebrate Paleontology
SWDR	Stormwater Data Report
SWMP	Statewide Storm Water Management Plan
SWPPP	stormwater pollution prevention program
SWRCB	State Water Resources Control Board
TDM	Transportation Demand Management
TDS	total dissolved solids
TIP	Transportation Improvement Program
TMDL	total maximum daily load
Tmk	Eocene-age Markley Formation
TMP	Transportation Management Plan
TNM 2.5	Traffic Noise Model Version 2.5
TOC	total organic carbon
TSCA	Toxic Substances Control Act
TSM	Transportation System Management
TSS	total suspended solids
TVSS	total volatile suspended solids
UBC	Uniform Building Code
UCL	upper confidence limit
UCMP	University of California Museum of Paleontology
UPRR	Union Pacific Railroad
USA	Underground Service Alert
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geologic Survey
VELB	valley elderberry longhorn beetle
VHD	vehicle hours of delay
VHT	vehicle hours of travel
VIA	Visual Impact Assessment
VMT	vehicle miles traveled
VOC	volatile organic compound
WB	westbound
WDR	waste discharge requirement
WET	waste extraction test
WPCP	Water Pollution Control Plan
Y	Yolo silty clay loam

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