Interstate 80 Integrated Corridor Mobility (ICM) Project

ALAMEDA AND CONTRA COSTA COUNTIES, CALIFORNIA
DISTRICT 4 – ALA-80 (PM 1.99-8.04)
CC-80 (PM 0.0-13.49)
EA 3A7720

Draft Initial Study (with Proposed Mitigated Negative Declaration)/ Environmental Assessment

Prepared by the
State of California Department of Transportation

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

Caltrans

April 2011

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GENERAL INFORMATION ABOUT THIS DOCUMENT

What's in this document?

This Initial Study/Environmental Assessment (IS/EA) has been prepared by the California Department of Transportation (Department) to identify and evaluate the potential environmental impacts of the alternatives being considered for the proposed project in Alameda and Contra Costa Counties, California. The document describes why the project is being proposed, what alternatives have been considered for the project, the existing environment that could be affected by the project, potential project-related impacts and proposed impact avoidance, minimization and/or mitigation measures.

What you should do:

- Please read this IS/EA. Additional copies of this document as well as the technical studies are available for review at the Caltrans District 4 Office, 111 Grand Avenue, Oakland, California, 94612. A PDF of this document may be obtained from http://www.dot.ca.gov/dist4/envdocs.htm
- We welcome your comments. If you have any comments regarding the proposed project, please send your written comments to the Department by the deadline.
    - Submit comments via postal mail to:

      Caltrans District 4
      Attention: Valerie Shearer
      Office of Environmental Analysis, MS-8B
      P.O. Box 23660
      Oakland, CA 94623-0660

    - Submit comments via email to Valerie_Shearer@dot.ca.gov
- Submit comments by the deadline: May 25, 2011

What happens next?

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

For individuals with sensory disabilities, this document can be made available in Braille, large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation Caltrans District 4, Attn: Valerie Shearer, Office of Environmental Analysis, MS-8B, P.O. Box 23660, Oakland, CA, 94623-0660; (510) 286-5594, Voice, or use the California Relay Service TTY number, 711.

SCH#_____
04-ALA-80-PM 1.99/8.04
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Project Number 04 0000 2039

Implementation of systems management strategies (ramp metering, managed lanes, and incident management) along I-80, from the San Francisco-Oakland Bay Bridge Toll Plaza (Alameda County; postmile 1.99) to the Carquinez Bridge (Contra Costa County; postmile 13.49).

INITIAL STUDY with Proposed Mitigated Negative Declaration/ ENVIRONMENTAL ASSESSMENT

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

THE STATE OF CALIFORNIA

Department of Transportation

Alameda County Transportation Commission

4-15-11

Date of Approval

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

SCH# _____

PROPOSED
Mitigated Negative Declaration

Pursuant to Division 13, Public Resources Code

Project Description

The California Department of Transportation (the Department) proposes to implement systems management strategies (ramp metering and incident management) along a 19.5-mile portion of I-80 from the San Francisco-Oakland Bay Bridge Toll Plaza to the Carquinez Bridge. The project would monitor traffic operations through the use of closed circuit television cameras and traffic congestion detection devices. At 23 on-ramps where ramp metering would be installed, preferential High Occupancy Vehicle (HOV) lanes would be constructed to minimize delay for carpools and transit.

Determination

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

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

The proposed project would have no effect on land use, community impacts, growth, farmlands/timberlands, and utilities/emergency services.

In addition, the proposed project would have no significant effect on the coastal zone, traffic and transportation, visual/aesthetics, cultural resources, hydrology and floodplain, water quality and storm water runoff, geology, hazardous waste/materials, air quality, noise, and biological resources.

The proposed project would have no significant adverse effect on paleontological resources because the following mitigation measure would reduce potential effects to insignificance:

> ***Mitigation Measure PAL-1:*** *Prior to the start of construction, a qualified paleontologist shall be retained to conduct a field survey of the project right-of-way to identify exposures of sensitive stratigraphic units that may be disturbed during project construction. A Paleontological Evaluation Report (PER) shall be prepared to define actual locations where monitoring will be necessary based upon the project design. The PER shall be prepared in accordance with the Department's Standard Environmental Reference (SER).*
>
> *For any areas where surface expressions of sensitive stratigraphic units are identified, and for any areas where subsurface excavation is anticipated, the project paleontologist shall both design and implement a paleontological mitigation program (PMP) for the project. The PMP shall be designed by the project paleontologist consistent with Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 1995, 1996) and with the Department's SER. The PMP shall include at a minimum: Preconstruction coordination; construction monitoring; data recovery; fossil treatment; curation procedures; and reporting.*

_____ _____

Bijan Sartipi Date
District Director
California Department of Transportation, District 4

DRAFT

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Chapter 1
Proposed Project

1.1 Introduction

Interstate 80 (I-80) is an integral part of the San Francisco Bay Area transportation network. The freeway is a major thoroughfare for commuters, is heavily used by transit services, and also provides access for the transport of goods into and out of the region. The proposed project area of the I-80 corridor (hereafter referred to as the project corridor) extends from the San Francisco-Oakland Bay Bridge Toll Plaza (Alameda County I-80 postmile 1.99) to the Carquinez Bridge (Contra Costa County postmile 13.49), and connects to I-880 and I-580. Within the project corridor, I-80 is a freeway providing four general-purpose lanes and one high occupancy vehicle (HOV) lane in each direction between the San Francisco-Oakland Bay Bridge toll plaza and I-580. Between I-580 and just south of State Route 4 (SR-4), I-80 eastbound provides three general-purpose lanes in each direction. Between I-580 and the Carquinez Bridge, I-80 westbound also provides one HOV lane in addition to the three general-purpose lanes. Between I-580 and south of SR-4, I-80 eastbound also provides one HOV lane in addition to three general-purpose lanes.

Traffic congestion within the project corridor is among the worst in the San Francisco Bay Area due to heavy traffic volumes during the weekday peak commute hours, and this congestion is projected to increase over the next 25 years due to continued population growth. The existing and forecasted congestion affects the efficiency of the movement of people and goods through the I-80 corridor by reducing travel speed and increasing travel time. The frequent traffic congestion also contributes to accidents on both the freeway and local arterials, which in turn can create secondary traffic incidents. The heavy traffic congestion also adversely affects the time it takes for emergency services to respond to accidents and incidents along the corridor. The heavy traffic volumes and frequency of accidents and incidents also impacts transit services operating along the project corridor by creating delays and reduced travel time reliability.[1]

Substantial capacity improvements to the existing I-80 freeway are not practicable because the freeway is constrained by San Francisco Bay and existing development throughout much of the corridor. Because of the physical constraints, it is not feasible to widen the freeway or to construct new connecting arterials as a solution to the existing and projected traffic congestion problems. As a result, strategies to reduce congestion, reduce travel time and improve safety along the I-80 corridor must focus on optimizing the use of the existing infrastructure. This can be accomplished through a number of system management strategies, such as adaptive ramp metering[2] and incident management.

[1] Travel time reliability measures the extent of unexpected delay during a trip. It is defined as the consistency or dependability in travel times, as measured from day-to-day and/or across different times of the day.

[2] The term "adaptive" refers to the ability of the ramp metering system to adjust the "green rate" based on traffic flows in the freeway mainline and ramp queuing. For example, if the system detects (through detection loops in the pavement) that the ramp queue is overflowing onto the local streets/arterials, the ramp meters increase the frequency of green lights until the overflow is cleared. See Section 1.3 for additional information.

The California Department of Transportation (the Department) proposes to implement systems management strategies (adaptive ramp metering and incident management) along a 19.5-mile portion of I-80 from the San Francisco-Oakland Bay Bridge Toll Plaza to the Carquinez Bridge. The system management strategies for the I-80 corridor have been assembled into a single project referred to as the I-80 Integrated Corridor Mobility (ICM) project. **Figure 1-1** depicts the project location within the San Francisco Bay Area.

In addition to system management strategies, the I-80 ICM project would also include monitoring traffic operations through the use of closed circuit television cameras and traffic congestion detection devices. Traffic demand information gathered from the cameras and traffic loop detectors[3] would be used to adjust the ramp metering signal rates, so that traffic flows could be managed to reduce congestion. At 8 out of the 40 on-ramps where adaptive ramp metering would be implemented, High Occupancy Vehicle (HOV) preferential lanes would also be included in order to minimize delay to carpools and transit. Three out of these 8 on-ramps would require widening to accommodate the HOV preferential lanes. Incident-related freeway traffic congestion would also be monitored through information gathered from the closed circuit television cameras and traffic loop detectors. Appropriate tow-truck dispatchers or first incident responders would be quickly dispatched to the site to clear the incident, minimizing the traffic impacts and incident related delays.

The project would be implemented by the Alameda County Transportation Commission (Alameda CTC) and funded by federal, state and local funds. The Department is the lead agency for the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Related Transportation Planning Documents

The project is included in the FY 2010/2011 Metropolitan Transportation Commission's (MTC) Transportation Improvement Program (TIP) as project number ALA070041. MTC approved the financially constrained TIP on October 27, 2010. On December 14, 2010, the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) approved the TIP. The project is also included in the MTC's 2009 Regional Transportation Plan (RTP), *Transportation 2035* (project numbers 230402 and 230597).

In October 2010, the Department approved the I-80 Corridor System Management Plan (CSMP), a transportation planning document that presents an analysis of existing and future traffic conditions and proposes traffic management strategies and capital improvements to maintain and enhance mobility within the project corridor.[4] The I-80 ICM project is one of the two near-term recommended projects and strategies included in the CSMP.

Related Projects

Several other system management strategies are planned or have been implemented within the project corridor and connecting arterial roadways, as discussed below. Each of these projects, while separate and

[3] A loop detector is simply a wire circuit system embedded in the road's surface that can detect when a car arrives at an intersection, when too many cars are stacked up at an intersection, or when cars have entered a turn lane.

[4] CSMPs are being developed throughout the state for corridors within which funding is being used from the Corridor Mobility Improvement Account (CMIA) and Highway 99 Bond Programs created by the passage of the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, approved by the voters as Proposition 1B in November 2006. The intent is to eventually develop CSMPs for all urban freeway corridors.

having independent utility and purpose, would work together and complement the proposed I-80 ICM project, to better manage traffic flow, reduce congestion, and improve safety throughout the project corridor.

- The I-80 Traffic Operations Systems (TOS) project includes the installation of a linked highway advisory radio and changeable message sign system and associated freeway traffic monitoring stations in the project corridor. The I-80 TOS project provides basic real-time travel information to drivers (i.e., travel times and reported accidents). The project construction is anticipated to be completed by May 2012.
- The San Pablo Corridor Arterial and Transit Improvement Project involves the implementation of informational message signs, traffic signal synchronization, emergency vehicle pre-emption, and other components to manage traffic flows that divert from I-80 to San Pablo Avenue as a result of congestion or other incidents on the freeway. The project construction is anticipated to be completed by January 2014.
- The Richmond Parkway Transit Center project involves several improvements to a park-and-ride and bus terminal facility, including construction of a new parking structure, bus bays, new signals at Richmond Parkway and Blume Drive and a parking management system. Information signs for the availability of parking spaces and associated bus schedules will be integrated with the I-80 ICM project to enhance real time traveler information. A completion date for the project has not been determined and will depend on available funding.

1.2 Purpose and Need

1.2.1 Project Purpose

The I-80 corridor is one of the most congested corridors in the San Francisco Bay Area, with traffic volumes reaching 312,000 vehicles per day and an average of 7,500 hours of daily traffic delays. **Figure 1-2** provides a flow diagram of the bi-directional (eastbound and westbound) annual average daily traffic (AADT) volumes on I-80. The highest traffic volumes occur between the I-80/I-580/I-880 interchange (commonly referred to as “The Maze”) and Powell Street. The Department, in cooperation with local transportation agencies, implemented several capacity improvement projects along this freeway to address recurring congestion; however, segments of the corridor remain congested for up to 10 hours on a daily basis.

The purpose of the project is to optimize use of the existing infrastructure within the corridor by implementing system management strategies to reduce congestion, reduce travel time, and improve safety. The project is expected to provide the following benefits:

- Improve travel time within the existing transportation network by optimizing the use of existing lanes
- Improve the safety and operation of the transportation network
- Reduce traffic congestion by decreasing incident recovery time
- Improve travel time reliability.

1.2.2 Project Need

1.2.2.1 Capacity, Transportation Demand, and Safety

Travel Time

Under existing conditions, substantial traffic congestion occurs along westbound I-80 during the morning peak period (6:00 AM to 10:00 AM), due to high travel demand and lack of available capacity at several interchanges including The Maze, Powell Street, I-580, San Pablo Dam Road, and Pinole Valley Road interchanges. Substantial traffic congestion occurs along eastbound I-80 during the evening peak period (2:00 PM to 7:00 PM), especially near the interchanges with I-580, Carlson Boulevard, San Pablo Avenue, and SR-4. Currently, it takes an average of 24 minutes in the morning peak period to travel from SR-4 to The Maze, a distance of approximately 16 miles. In the evening, the eastbound return trip takes an average of 25 minutes.

According to population growth forecasts published by the Association of Bay Area Governments (ABAG), the population within the San Francisco Bay Area is expected to increase by two million people within the next 25 years. Portions of the I-80 freeway corridor are expected to experience an increase in traffic volumes of 30 to 45 percent, while connecting arterial roadways are expected to experience an increase in traffic volumes of 20 to 50 percent. A computerized regional traffic model was developed to simulate anticipated changes in travel time resulting from the forecasted population growth. As shown in **Table 1-1**, under 2015 No-Build conditions, travel time from SR-4 to The Maze would increase by approximately 17 percent in the morning peak period, and by more than 70 percent in the evening peak period.

Table 1-1: Average Travel Time between The Maze and SR-4

Peak Hour, Direction	Simulated Results		
	Existing	2015 No-Build	% Change from Existing
AM, Westbound	21.7	25.4	+17%
PM, Eastbound	23.6	40.4	+71%

Traffic Incidents

Congested freeway conditions encourage erratic driver behavior, increasing the potential for rear-end and side-swipe accidents. The information contained in the Department's Traffic Accident Surveillance and Analysis System database indicates there were 6,285 recorded accidents in the project corridor between November 2004 and October 2007. Approximately 60 percent of these accidents occurred in the westbound lanes, while approximately 40 percent occurred in the eastbound lanes. More than half of the accidents occurred between The Maze and the I-580 merge/split. The accident rate on this segment of I-80 is nearly 80 percent higher than the statewide average for similar freeway facilities (see Section 2.2.3 for detailed traffic accident rates). Approximately 76 percent of the accidents involved property damage only, while 24 percent involved injuries (0.5 percent involved fatalities).

No methodology exists that can accurately predict future accident patterns on freeway mainlines[5], but it is generally accepted that as vehicle miles travelled (VMT) increases due to increased volume and congestion, collision rates also will increase. Between the existing year and 2015, VMT is expected to increase by 9 percent, suggesting that incidents will increase by a similar margin.

The combined effect of accidents and traffic congestion also has the effect of hindering emergency response by increasing the amount of times it takes to respond and reach an incident.

Incident Recovery Time

Under existing conditions, when an incident occurs on I-80 within the corridor, substantial congestion occurs, especially during peak traffic periods. The amount of time the freeway is affected (referred to as "recovery time") is directly related to how quickly emergency services, and/or roadside assistance, can reach the incident and clear blocked lanes. Because emergency response is also hindered by congestion, the recovery time increases as congestion levels increase.

Real-Time Traffic Information

The combination of high rates of traffic incidents and long recovery times leads to an inconsistency and lack of dependability in travel times within the project corridor. Travel time and delays can be unpredictable, and vary greatly during the peak commute times. A trip from the Carquinez Bridge to The Maze during the morning peak period (6:00 AM to 10:00 AM) can range from 20 to 40 minutes. This affects all trips within the project corridor. Drivers want travel time reliability.[6]

Existing changeable message signs within the project corridor provide estimated travel times to popular destinations (i.e., major cities and bridges) within the transportation network. Information on traffic incidents is primarily shared via the Internet and the telephone through the San Francisco Bay Area 511 system. The existing changeable message signs do not provide real-time lane conditions to advise motorists of an incident ahead, nor can they provide comparable travel times for optional freeway routes or alternative modes of transportation. Real-time traffic information would allow drivers to make better choices regarding route and mode to reach their destination, which in turn would result in more reliable expectations regarding travel times.

1.2.3 Logical Termini and Independent Utility

The San Francisco-Oakland Bay Bridge and the Carquinez Bridge are logical termini for the project as they represent the major destinations for the traffic along I-80. These bridges connect the East Bay area with San Francisco, the North Bay, and destinations inland, including the Sacramento metropolitan area. This segment of I-80 also provides access to portions of eight cities located in Alameda and Contra Costa Counties, and provides connection to other major freeways, including I-580 and to I-880. Many commuters that reside in Contra Costa County and northern Alameda County use this segment of I-80 when traveling to and from work in Oakland, San Francisco, and other employment centers.

Origin and destination data for the project corridor shows that over 55 percent of trips that use the Carquinez Bridge in the AM peak hour westbound continue west to The Maze, and 31 percent continue

[5] The travel lanes on a freeway are considered the "mainline".

[6] FHWA, 2006. Travel time reliability, making it there on time, all the time. Available at: http://ops.fhwa.dot.gov/publications/tt_reliability/brochure/ttr_brochure.pdf; Last accessed: March 30, 2011.

on to the San Francisco-Oakland Bay Bridge. In the eastbound direction, vehicle trips from The Maze during the PM peak hour primarily end up at four destinations: Albany/Berkeley/Emeryville, I-580, Richmond to Pinole, and east of the Carquinez bridge. Forty-four percent of the traffic originating from the Maze during the PM peak hour is from the San Francisco Bay Bridge. The San Francisco-Oakland Bay Bridge and the Carquinez Bridge, providing toll facilities and no on- or off-ramps, are in effect the endpoints of the project corridor that would not benefit from the proposed improvements.

Transportation projects must also have independent utility and the project must be a reasonable cost even if no additional transportation improvements are made in the area. The I-80 ICM project considered in this environmental document represents transportation improvements that would meet the project's purpose and need and would not require further improvements that would have additional environmental effects. The project would not restrict considerations of alternatives for other reasonably foreseeable transportation improvements.

1.3 Project Description

The I-80 ICM project proposes the installation of operational improvements and the use of an Intelligent Transportation System (ITS), along a 19.5-mile portion of I-80, from the San Francisco-Oakland Bay Bridge Toll Plaza to the Carquinez Bridge. ITS is a combination of computer and communication technologies that make transportation systems operate more efficiently and safely. The primary components of the project include:

1. Installation of signs and signals to manage traffic during incidents
2. Installation of signs to share traffic and transit information
3. Installation of ramp metering at 40 on-ramps[7]

These components would be controlled via software communication links by the Department's Transportation Management Center (TMC), currently located at the Department's District Office in Oakland. Activities at the TMC include monitoring freeway traffic, incidence response, and coordinating with the California Highway Patrol (CHP) and Bay Area 511 to provide real-time traffic information to motorists. The information gathered through the vehicle detection devices alerts the TMC operator about any traffic incidents and/or congestion. The operator then can monitor the situation via closed-circuit television cameras, activate incident response strategies, and display real-time traveler information to the motorists on the freeway. During any major incidents, the TMC operator would also coordinate the emergency response with local authorities to ensure a coordinated and efficient response.

1.3.2 Alternatives

1.3.2.1 Build Alternative

The Build Alternative involves installation of operational improvements from The Maze (Alameda County I-80 postmile 1.99) to the Carquinez Bridge (Contra Costa County postmile 13.49). The improvements would occur at specific locations along the 19.5-mile corridor.

[7] There are a total of 44 on-ramps within the project corridor. The I-80 ICM project would implement adaptive ramp metering at 40 on-ramps. Three out of the remaining four on-ramps in the project corridor (eastbound SR-4; eastbound Cummings Skyway; and eastbound Willow Avenue) would have adaptive ramp metering implemented under the I-80 Eastbound HOV Lane Project. Ramp metering has already been implemented at the Willow Avenue westbound on-ramp.

Table 1-2 lists all of the components of the Build Alternative. **Figure 1-3** depicts where the components would be installed (each component is associated with an identification number). **Appendix C** contains more detail regarding these locations.

Table 1-2: Components of the Build Alternative

Component	Number of Units	Height (feet)
Sign Bridge Structures (Gantries)		
Sign Bridge Structures (Gantries)	11	29
Variable Advisory Speed Signs	33	n/a
Variable Message Signs (Type 2)	4	n/a
Lane Use Signals	52	n/a
Stand-Alone Components		
Variable Advisory Speed Signs [A]	34	14
Information Display Boards	6	32
Variable Message Signs (Type 1)	4	12
Closed-Circuit Television Cameras	19 [B]	40
Adaptive Ramp Metering		
Adaptive Ramp Metering Equipment [C]	145	21
On-Ramp Loop Detection	237	n/a
System Loop Detection (freeway mainline) [D]	310	n/a
Ancillary Project Components		
Pull Boxes	379	n/a
Service Enclosures	13	n/a
Controller Cabinets	63	6
Conduit Installation [E]	50,000 lf [F]	n/a
Construction Staging Areas	15 areas	n/a
Ramp Widening for High-Occupancy Vehicles (HOV) Preferential Lanes		
Ashby HOV Lane	1	n/a
University HOV Lane	1	n/a
State Route 4 (SR-4) HOV Lane	1	n/a

Notes:

A. 28 on new poles; remainder of 6 installed on existing signs

B. Installed on 18 new poles; one pole contains two cameras

C. Including ramp meter signals and “meter on” signs

D. Loop detectors and related traffic sensors proposed at 35 locations

E. A 20-foot-wide temporary impacts corridor encompasses impacts from both device and conduit

F. lf = Linear Feet

The operational improvements consist of system management strategies that will make the most efficient use of the existing transportation network to improve travel time and travel reliability through the project corridor. As described below, the system management strategies (known collectively as an intelligent transportation system) include incident management, adaptive ramp metering, and traffic and transit information sharing.

Incident management (described in detail below), as part of the intelligent transportation system, has had dramatic impacts on highway travel in other industrialized nations.[8] Pioneering stages of these systems have been used in Germany since the 1960s. Its application throughout the rest of Europe has led to:[9]

- Increase in throughput: 7 percent
- Increase in capacity: 30 percent
- Decrease in primary accidents: 30 percent
- Decrease in secondary accidents: 50 percent
- Travel time reduction: 20 percent

Implementation of the proposed intelligent transportation system within the project corridor would likely result in similar benefits, as discussed below. Reducing traffic congestion related to normal peak commute periods and accident-related traffic would result in less variability in travel times within the project corridor. This would result in an increase in travel time reliability.

Incident Management

Incident management is the use of signs and signals to provide drivers with advance warning of accidents, construction zones, or other incidents. When one or more travel lanes are blocked, erratic driving behavior increases as drivers attempt to suddenly change lanes and/or exit the freeway. Incident management improves safety and assists emergency responders in reaching those in need.

The Build Alternative includes several types of signs and signals to provide graphic or text messages that warn motorists of downstream conditions and lane closures.

Sign Bridge Structures (Gantries)

Under the Build Alternative, a total of 11 overhead sign bridge structures (gantries) would be constructed above the westbound I-80 travel lanes per the Department's design standards. The maximum gantry height would be 29 feet. Three types of signs would be installed on the gantries, as described below.

- A lane use signal would be installed over each freeway travel lane to show speed warning signs, queue warnings, lane management instruction, and advisory text. The lane use signals would be used for lane management during periods of incidents and for work zone management. These signs would be operable 24 hours a day.

[8] FHWA, 1999. Innovative Traffic Control Technology and Practice in Europe. Available online at: http://www.itsbenefits.its.dot.gov/its/benecost.nsf/ID/5F01DD9F62A2282C8525733A006D4BEA?OpenDocument&Query=BApp; Last accessed: March 30, 2011.

[9] Mercer Island Reporter, April 27, 2010. WSDOT adds electronic signs to manage lanes on regional interstate highways. Available at: http://www.pnwlocalnews.com/east_king/mir/news/92201899.html; Last accessed: March 30, 2011.

- Variable advisory speed signs would only be activated during incidents and lane closures. Variable advisory speed signs would display lower advisory speeds prior to incident-related congestion or lane closures to slow traffic ahead of end of queue, thereby reducing rear-end collisions. This technique is known as "end of queue warning." The speeds displayed are advisory only, and are not enforceable.
- A variable message sign (Type 2) would be installed on every third gantry on the upper right corner of the gantry. Each variable message sign would be full color and would provide driver information regarding incidents, work zones, and lane closures. These signs would operate during incidents and lane closures.

Figure 1-4 provides an illustration of a gantry, including representative display messages for the lane use signals, variable advisory speed signs, and variable message signs.

Incident management helps reduce traffic congestion. Previous studies have found that if drivers are aware of lane-blocking incidents downstream, traffic congestion can be reduced since drivers would be gradually merging into adjacent lanes and avoiding last-second forced merging, which can lead to secondary accidents.[10] The activation of the lane use signals and variable message signs would inform drivers to merge into other lanes prior to an accident scene. These signs would facilitate merging for traffic entering I-80 from on-ramps.

Variable advisory speed signs would display lower advisory speeds prior to incident-related congestion to slow traffic ahead of time, thereby reducing rear-end collisions. This technique is known as "end of queue warning."

It is expected that the operation of the signs and signals would result in a reduction in the accident rate along I-80. The benefits of an accident rate reduction include a lower number of injuries and fatalities, a decrease in property damage costs, and a reduction in incident-related traffic congestion. In corridors such as I-80, incident-related traffic congestion is approximately half of the total delay on the freeway. A reduction in the number of incidents can also lead to a reduction in the total hours of delay experienced in the I-80 corridor. Such a reduction would facilitate the project purpose of decreasing traffic incidents, including secondary accidents – thereby improving traffic safety and reducing incident/accident-related delays and congestion.

Installation of the gantries would involve construction of cast-in-drill-hole concrete foundation to support the sign bridge structures, as well as trenching for the installation of new electrical conduit, in some locations. Where feasible, existing electrical lines would be used to power the signs and signals.

Stand-Alone Components

Variable Advisory Speed Signs

Stand-alone variable advisory speed signs would be installed at 34 locations in both the eastbound and westbound directions on I-80. The maximum height of the variable advisory speed signs would be 14 feet. The operation of these signs would reduce rear-end collisions by warning drivers of slow traffic speeds.

[10] Mercer Island Reporter, April 27, 2010. WSDOT adds electronic signs to manage lanes on regional interstate highways. Available at: http://www.pnwlocalnews.com/east_king/mir/news/92201899.html; Last accessed: March 30, 2011.

Installation of the variable advisory speed signs includes the construction of post foundations, as well as trenching for installation of new electrical conduit in some locations. Solar power and wireless communication would be utilized for stand-alone variable advisory speed signs.

Variable Message Signs (Type 1)

Stand-alone variable message signs (Type 1) would be installed at two high-speed westbound I-80 on-ramps at SR-4 (John Muir Parkway) and Ashby Avenue, one sign each on each side of the on-ramp, for a total of four locations. The signs would provide advanced warning to motorists that the ramp meter is in operation. These signs would help to reduce rear-end collisions by warning drivers of slow traffic speeds at the ramp meters.

Installation of the variable message signs would include the construction of post foundations, as well as trenching for installation of new electrical conduit in some locations.

Closed-Circuit Television Cameras

A total of 19 closed-circuit television cameras would be installed along the corridor. The maximum closed-circuit television camera pole height would be 40 feet. The closed-circuit television cameras would be used for monitoring traffic conditions. The traffic images would be transmitted to the Department's TMC in Oakland using fiber optic or wireless technology. Electricity to power the camera and the fiber optic line would be contained within a buried conduit.

Installation of closed-circuit television cameras would include the construction of cast-in-drill-hole concrete foundations, as well as trenching for installation of new electrical conduit in some locations.

Traffic and Transit Information

The Build Alternative would use information display boards to provide motorists with information on traffic conditions and travel time, and parking availability at the Richmond Parkway Transit Center, when constructed. Providing motorists with traffic and transit information would allow individuals to make informed decisions on alternative freeway routes, which in turn would result in reliable expectations regarding travel times.

Up to six full-color graphic information display boards would work in concert with the lane use signals and variable advisory speed signs and related communication infrastructure. The information display boards would provide motorists with information about congestion, work zones, accidents, and travel time.

An illustration of an information display board, together with representative information displayed, is provided in **Figure 1-5.** The maximum height of the pole would be 32 feet. The dimension of the information display board would be approximately 10.5 feet wide by 13 feet high.

A San Francisco Bay Area study has found that up to approximately 8 percent of drivers changed the mode of travel based on transit travel information displayed on freeway signs.[11] When drivers know travel times in advance, they can select the fastest freeway route and/or alternate mode of transportation

[11] California Center for Innovative Transportation, 2009. Travel Times on Changeable Message Signs Volume II – Evaluation of Transit Signs

to avoid the congested route.[12] Information display boards would provide updates on the availability of parking (when the Richmond Parkway Transit Center is constructed) and transit options or alternate freeway routes, which would allow motorists to choose an alternate freeway route or transit mode (BART or buses) to complete the trip. Related projects within the project corridor include features, such as the informational message signs along the San Pablo Avenue (which runs parallel to I-80), that will help manage traffic flow along arterial roadways in the event of a major incident. Informational message signs would direct motorists to return to the freeway, downstream of the incident location.

Adaptive Ramp Metering

Ramp metering is a common freeway traffic management technique and has been implemented throughout the state. Ramp meters are traffic signals located at on-ramps to control the flow of vehicles from the ramp onto the freeway. As one of the few freeway corridor management tools available, ramp meters are usually implemented to achieve two main goals: 1) manage the amount of traffic entering a freeway in an attempt to prevent freeway flows from reaching capacity, while managing ramp demand, and 2) break up dense groups of vehicles entering the freeway from an upstream arterial traffic signal.[14]

Typical ramp metering in California is installed with pre-timed (or fixed-rate) rates, whereby the frequency of the green lights (the "green rates") throughout the day are pre-determined based on the analysis of historical traffic data. This metering strategy is designed to cope with "typical" traffic conditions and is not able to incorporate real-time variations in freeway conditions. Consequently, the effectiveness of the fixed-time rates deteriorates with large variations in freeway conditions or when non-recurrent conditions (e.g., traffic incidents) occur on freeways. With the enhancement of traffic monitoring technology, this strategy has been replaced by more sophisticated metering algorithms that account for real-time traffic conditions, such as the adaptive ramp metering technology proposed under the Build Alternative.

The term "adaptive" refers to the ability of ramp metering to adjust the "green rate" based on traffic flows in the freeway mainline and ramp queuing. For example, if the ramp queue is approaching the local arterials, loop detectors installed in the pavement automatically advise the ramp meter signals to increase the frequency of green lights to manage the queue. The adaptive ramp metering that would be implemented as part of this project would have the ability to adjust metering rates at all ramps as a corridor-wide system. The "green rates" at some ramps would automatically decrease to compensate for the increase in "green rates" at other ramps at which the queue needed to be shortened. The meters adapt and re-adjust to manage congestion or to help motorists move through traffic incidents better by preventing too many vehicles from entering the freeway simultaneously. This corridor-wide approach to ramp metering would effectively manage the operation of congested portions of the freeway mainline.

The project would implement adaptive ramp metering at 40 on-ramps within the project corridor. The maximum height for a ramp meter installation across three lanes would be 21 feet. **Table 1-3** presents the

[12] Mercer Island Reporter, April 27, 2010. WSDOT adds electronic signs to manage lanes on regional interstate highways. Available at: http://www.pnwlocalnews.com/east_king/mir/news/92201899.html; Last accessed: March 30, 2011.

[14] Transportation Research Board (TRB) of the National Academies, 2009. Empirical Evaluation of Freeway Corridor Performance Before and After System-Wide Adaptive Ramp Metering System Implementation. Submitted for presentation and publication to the 88th Annual Meeting of the Transportation Research Board, January 11–15, 2009. Available online at: http://www.its.pdx.edu/upload_docs/1249575494.pdf; Last accessed: March 30, 2011.

locations where the ramp metering equipment would be installed. Electricity for the adaptive ramp metering would be provided by an existing source.

Table 1-3: Freeway On-ramps with Proposed Adaptive Ramp Metering Improvements

I-80 Eastbound On-ramps	I-80 Westbound On-ramps
City of Emeryville	
Powell St.	Ashby Ave. & Frontage Rd.*
	Powell St./Frontage Rd.
	Powell St.
City of Berkeley	
Ashby Ave./Potter St.	Gilman St.*
University Ave.	University Ave. (loop)
Gilman St.	
City of Albany	
Buchanan St.	Buchanan St.*
City of Richmond	
Central Ave.	Westbound Hilltop Dr. (loop ramp)
Carlson Blvd.	Hilltop Dr. (diagonal) *
San Pablo Ave.	Solano Ave.
El Portal Dr.*	Barrett Ave.
Eastbound Hilltop Dr. (loop ramp)	Carlson Blvd.
Westbound Hilltop Dr. (diagonal)*	Central Ave.
City of El Cerrito	
Cutting Blvd. (loop ramp)	Potrero Ave.
Cutting Blvd.	
City of San Pablo	
San Pablo Dam Rd.	El Portal Dr.
	San Pablo Dam Rd.
City of Pinole	
Eastbound Fitzgerald/ Richmond Pkwy. (loop ramp)	Pinole Valley Rd.
Westbound Fitzgerald/Richmond Pkwy.	Appian Way
Southbound Appian Way (loop ramp)	Fitzgerald Dr./Richmond Pkwy.
Northbound Appian Way	
Pinole Valley Rd.	
City of Hercules	
	John Muir Pkwy. (SR-4)*
Crockett	
	San Pablo Ave./Pomona St.
	Cummings Skyway

* Ramp locations where HOV Preferential Lanes would be provided.

System Detection Devices

The system detection component of the Build Alternative consists of placing loop detectors and related traffic sensors in the pavement to monitor traffic flow. The devices would be placed within the freeway pavement and would not be visible to motorists. Installation of the system detection components requires making saw cuts into the pavement to install and connect the devices. Once installed, the pavement is sealed. In order to collect and disseminate the traffic data from the loop detectors, controller cabinets would be constructed on concrete pads along the freeway shoulder, adjacent to the loop detectors. The loop detectors and controller cabinets are collectively referred to as freeway traffic monitoring stations.

Ancillary Project Components

All of the above-described components would include pull boxes, controller cabinets, and service enclosures. The Build Alternative would require the installation of approximately 50,000 linear (approximately 10 miles) feet of new plastic conduit. The conduit would be 3 inches in diameter and installed either using an open trench or horizontal directional drilling. Pull boxes would be installed in association with the new conduit runs. Exhibits contained in **Appendix C** depict the location of the Build Alternative's conduit runs.

High Occupancy Vehicle (HOV) Preferential Lanes

There would be eight on-ramps with HOV Preferential lanes at the locations shown on **Table 1-3**, above. Existing lanes at five on-ramps within the project corridor would be restriped to include HOV preferential lanes. This involves removal of existing pavement striping and placement of new pavement striping. Three on-ramps within the project corridor would be widened to accommodate HOV preferential lanes. Widening would occur at the University Avenue westbound loop ramp, the SR-4 (John Muir Parkway) on-ramp and the Ashby Avenue westbound on-ramp. The lanes would be 12 feet in width and would be constructed within the existing right-of-way.

The benefit of including the HOV preferential lanes is to provide preferential treatment of carpools and transit vehicles, wherein the frequency of the green lights would be higher for the HOV preferential lanes. This would encourage drivers to carpool and use transit, thereby reducing the number of vehicles entering I-80.

Construction Methods

Installation of the improvements previously described would result in approximately 38,422 square feet of permanent ground disturbance and approximately 1,037,500 square feet of temporary ground disturbance. The majority of the temporary ground disturbance would be related to the installation of the required electrical and/or fiber optic conduits that would connect the various devices. Approximately 83 percent of this area would occur in developed and/or landscaped areas. **Table 1-4** provides a breakdown of the ground disturbance areas associated with the Build Alternative.

Table 1-4: Ground Disturbance Area

Structure	Area per Unit (square feet)	Total Area (square feet)
Permanent Ground Disturbance Area		
Sign Bridge Structures (Gantries)	39	432
Variable Advisory Speed Signs [A]	5	137
Information Display Boards	20	118
Closed-Circuit Television Cameras [B]	5	88
Adaptive Ramp Metering Equipment [C]	3	455
Variable Message Signs (Type 1)	6	25
Pull Boxes	5	2,062
Service Enclosures	1	15
Controller Cabinets	38	2,419
Ashby HOV Lane	20,038	20,038
University HOV Lane	2,614	2,614
SR-4 HOV Lane	10,019	10,019
Total Permanent Ground Disturbance Area		*38,422*
Temporary Ground Disturbance Area		
Installation [D]	20	1,000,000 [E]
Staging Areas	2,500	37,500
Total Temporary Ground Disturbance Area		*1,037,500*

Notes:

A. Thirty-four stand-alone installations; remainder installed on gantries or existing signs

B. Installed on 18 new poles; one pole contains two cameras

C. Including ramp meter signals and meter on signs

D. A 20-foot-wide temporary impacts corridor encompasses impacts from both device and conduit construction

E. Approximately 83 percent would be in developed or landscaped areas

Staging areas to accommodate project construction equipment, materials, and worker parking have been identified at 15 locations within the project corridor (see **Appendix C**). All staging areas would be located within existing paved or landscaped areas. In areas adjacent to salt marsh habitat, all staging areas would be placed east of the frontage road, and traffic cones would be used to prevent opportunistic worker parking in these areas (i.e., westbound on-ramp at Powell Street). Construction would begin in spring 2012, with an anticipated completion date of spring 2014.

Project Implementation

Implementation of the I-80 ICM Project would involve two projects that would not result in physical changes in the environment. These projects would include:

1. **Software and Systems Integration**– which involves upgrades and improvements to software and computer networks used by the Department to monitor and manage the intelligent transportation system implemented under this project.
2. **Procurement**– which involves the purchasing of the intelligent transportation system equipment such as the variable advisory speed signs, message signs, lane use signals, and full color information display boards

System Management Strategies

System management strategies increase the efficiency of existing facilities without increasing the number of through lanes. Examples of system management strategies include ramp metering, auxiliary lanes, turning lanes, reversible lanes and traffic signal coordination. System management also encourages a unified urban transportation system that integrates multiple forms of transportation modes such as pedestrian, bicycle, automobile, rail, and mass transit. The Build Alternative involves the installation of several types of System management strategies, as described above.

Transportation Demand Management Alternatives

There are several transportation demand management strategies within the San Francisco Bay Area that are used to reduce the number of vehicle trips along the I-80 corridor. Rideshare offers carpoolers reduced bridge tolls as well as access to carpool lanes. There is also a vanpool for larger groups of commuters. Transportation demand management may also involve the provision of contract funds to regional agencies that are actively promoting ridesharing, maintaining rideshare databases, and providing limited rideshare services to employers and individuals. Increased vehicle occupancy reduces traffic volumes during peak commuting periods; however, without the implementation of incident management, active ramp metering, and Traffic and Transit information components described above, successful implementation of a transportation demand management alternative would not reduce incidents, or improve travel time reliability. Accordingly, a transportation demand management alternative would not satisfy the purpose of the project.

1.3.2.2 No-Build Alternative

The No-Build Alternative is being evaluated in accordance with NEPA and CEQA requirements, and serves as the baseline comparison to the Build Alternative.

Under the No-Build Alternative, it is assumed that the following currently planned and funded projects for the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge would be constructed and operated by the year 2015:

Planned developments:

- New Town Center (City of Hercules)
- Hilltown (City of Hercules)
- Gateway at Emeryville (City of Emeryville).

Planned vehicular transportation improvements:

- I-80/Powell Street eastbound off-ramp widening
- I-80/Gilman interchange reconfiguration
- I-80/Central Avenue interchange modification
- I-80/San Pablo Dam Road interchange modification
- I-80/Pinole Valley Road eastbound on-ramp improvements
- I-80 eastbound HOV lane, SR-4 to Carquinez Bridge (currently under construction)
- Planned pavement maintenance project on I-80, from Alameda County post mile 2.5 to post mile 8.0
- Planned pavement resurfacing on I-80 in Oakland, Emeryville, Berkeley, and Albany.

Planned other alternative mode of transportation improvements:

- Planned bicycle and pedestrian pathways to be located along the south side of I-80 in conjunction with the San Francisco-Oakland Bay Bridge East Span Replacement Project
- Planned bicycle and pedestrian I-80 overcrossing located to the south of Ashby Avenue
- Richmond Parkway transit center
- Central Richmond greenway and Class I bicycle trail
- The Refugio bridge bicycle, pedestrian, and vehicle connectivity project in Hercules
- Planned plant establishment project for shoreline habitat planting in Oakland and Emeryville.

Traffic congestion would increase with the No-Build Alternative. Although the No-Build Alternative would improve access to the I-80 mainline through improvements to on-ramps and interchanges, the planned improvements would not address traffic congestion on the mainline. Because of the constrained condition of the existing right-of-way, widening the facility is not an option; managing the existing congestion caused by high traffic vlumes and traffic incidents is the only way to improve travel reliability.

The No-Build Alternative would not achieve the project purpose of improving travel reliability through the I-80 corridor because it would not reduce congestion on the mainline, it would not enhance real time traveler information, and it would not facilitate emergency responder operations.

1.3.3 Final Decision-Making Process

After the public circulation period, all comments will be considered, and the Department will select a preferred alternative and make the final determination of the project's effect on the environment. In accordance with CEQA, the Department will prepare a Negative Declaration (ND). Similarly, if the Department determines the action does not significantly impact the environment, the Department, as assigned by FHWA, will issue a Finding of No Significant Impact (FONSI) in accordance with NEPA.

1.3.4 Alternatives Considered but Withdrawn from Further Consideration

The withdrawn alternatives would involve the installation of active traffic management gantries and adaptive ramp metering elements with differing traffic management strategies. A description of each alternative and the reason it was withdrawn is summarized in **Table 1-5**.

The Build Alternative would incorporate several transportation management strategies. As such, the formulation of a separate transportation management strategy alternative is not necessary.

The existing transportation demand management programs are currently in place in the I-80 corridor. While it is possible that the implementation of additional transportation demand management programs and incentives in Alameda and Contra Costa counties (and surrounding communities) would reduce existing and projected future travel demand in the I-80 corridor, the transportation demand management program would not fulfill the project's purpose and need.

Table 1-5: Summary of Alternatives Considered but Withdrawn

Alternative	Summary and Reason for Withdrawal
Full Standard Alternative 1A	Alternative 1A is identical to the Build Alternative with respect to the proposed gantries and ramp metering (detection loops, controller cabinets, and communications). However, Full Standard Alternative 1A would provide an additional 32 HOV preferential lanes, and include CHP enforcement areas at appropriate locations on the eastbound and westbound I-80 on-ramps. While this alternative would achieve the purpose of the project, it was withdrawn due to the additional cost for right-of-way acquisition and potential impacts on sensitive biological resources that would occur due to ramp widening for inclusion of HOV preferential lanes and CHP enforcement areas.
Full Standard Alternative 1B	Alternative 1B is identical to the Build Alternative with respect to the proposed ramp metering. However, Full Standard Alternative 1B would provide an additional 32 HOV preferential lanes, and include CHP enforcement areas at appropriate locations on the eastbound and westbound I-80 on-ramps. Alternative 1B would also include the installation of gantries from Cutting Boulevard to The Maze along westbound I-80, and from The Maze to Buchanan Street along eastbound I-80. While this alternative would achieve the purpose of the project, it was withdrawn due to the additional cost for right-of-way acquisition and potential impacts on sensitive biological resources that would occur due to ramp widening for inclusion of HOV preferential lanes and CHP enforcement areas. Additional visual impacts would occur due to proposed gantries in the eastbound direction.

Alternative	Summary and Reason for Withdrawal
Full Standard Alternative 2	Alternative 2 is identical to the Build Alternative with respect to the proposed ramp metering. However, Full Standard Alternative 2 would provide an additional 32 HOV preferential lanes, and include CHP enforcement areas at appropriate locations on the eastbound and westbound I-80 on-ramps. Alternative 2 would not include the installation of stand-alone incident management elements between The Maze and Cutting Boulevard in the eastbound I-80 direction. While this alternative would achieve the purpose of the project, it was withdrawn due to the additional cost for right-of-way acquisition and potential impacts on sensitive biological resources that would occur due to ramp widening for inclusion of HOV preferential lanes and CHP enforcement areas.
Full Standard Alternative 3	Alternative 3 is identical to the Build Alternative with respect to the proposed ramp metering. However, Full Standard Alternative 3 would provide an additional 32 HOV preferential lanes, and include CHP enforcement areas at appropriate locations on the eastbound and westbound on-ramps. Alternative 3 would not include installation of any active traffic management elements such as gantries and stand-alone incident management elements. In addition to right-of-way and environmental impacts, the Full Standard Alternative 3 does not include active traffic management elements to reduce incident-related traffic congestion, and would therefore not meet the project purpose. As such, it was withdrawn from further consideration.

1.4 Permits and Approvals Needed

Table 1-6 identifies the permits/approvals that would be required for project construction.

Table 1-6: Permits and Approvals

Agency	Permit/Approval	Status
BCDC	Bay Conservation and Development Commission Permit	To be obtained prior to construction
USFWS	Letter of Concurrence	To be obtained prior to approval of the environmental document

Temporary construction easements would be required from the City of Richmond and the City of Berkeley to accommodate work outside state-owned right-of-way.

NOT TO SCALE

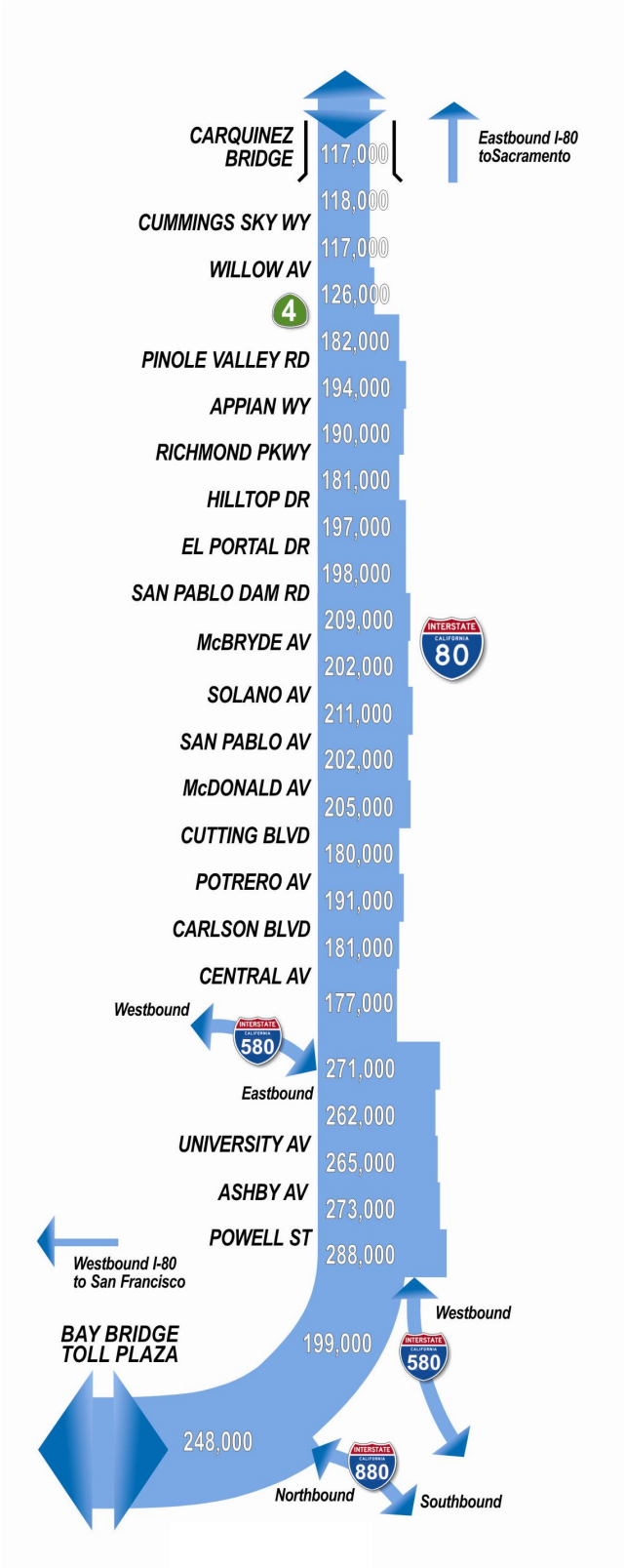
PROJECT LOCATION

SOURCE: ©2004, AERIALS EXPRESS, LLC

FIGURE 1-1

Interstate 80 Integrated Corridor Mobility Project

PROJECT LOCATION



LEGEND

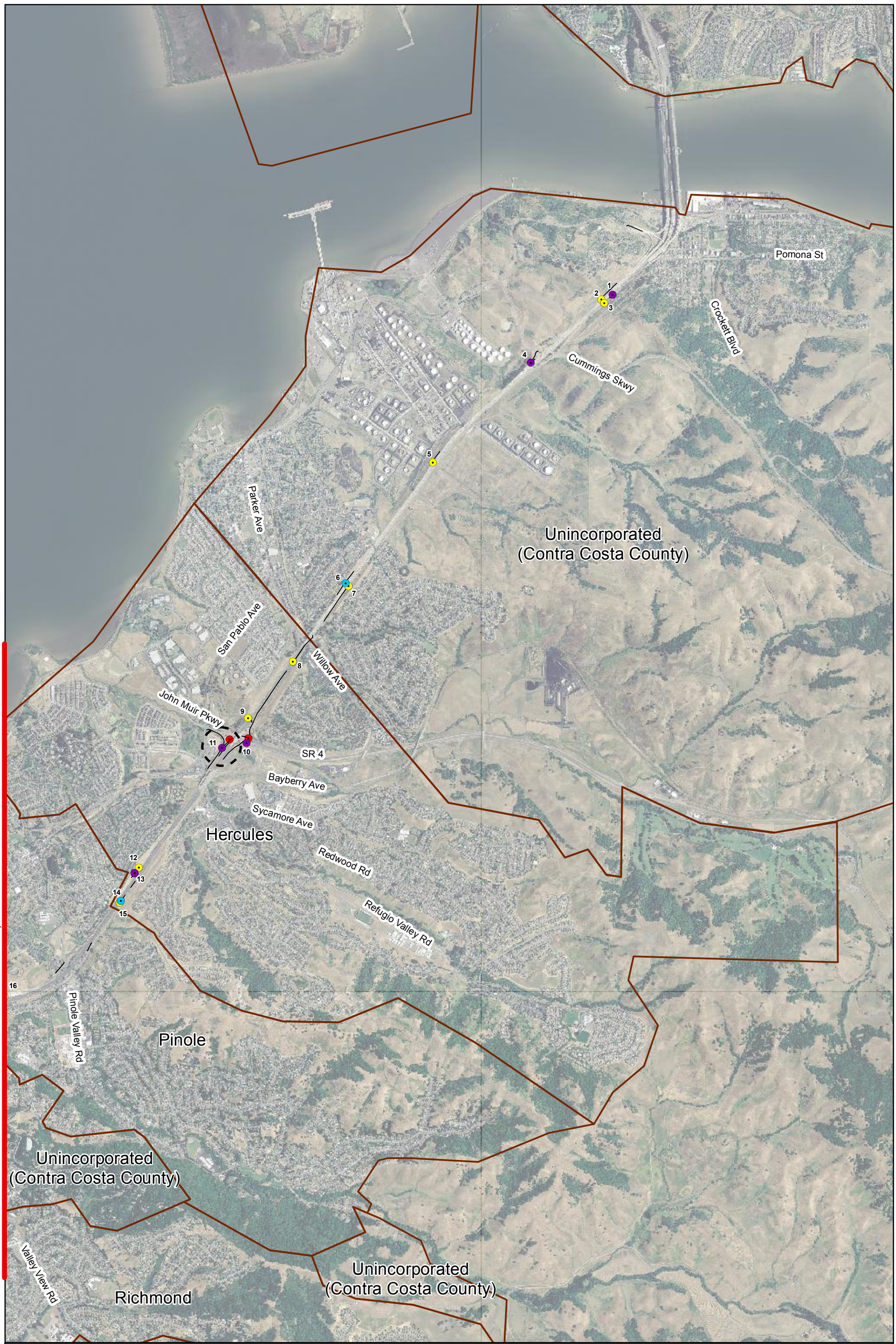
AADT - ANNUAL AVERAGE DAILY TRAFFIC

FIGURE 1-2

Interstate 80 Integrated Corridor Mobility Project

SOURCE: CALTRANS, 2008

I-80 Existing Bi-Directional AADT



SIGN BRIDGE STRUCTURE (GANTRY)

INFORMATION DISPLAY BOARD

VARIABLE ADVISORY SPEED SIGN

VARIABLE MESSAGE SIGN (TYPE 1)

CLOSE CIRCUIT TELEVISION CAMERA

CONDUIT RUN

CITY BOUNDARY

LOCATION OF RAMP WIDENING FOR HOV PREFERENTIAL LANE

0 500 1,000 2,000 3,000 4,000 Feet

SOURCE: ©2004, Aerial Express Map

Figure 1-3
Sheet 1 of 3

Interstate 80 Integrated Corridor Mobility Project

DEVICE AND RAMP DISTURBANCE LOCATIONS

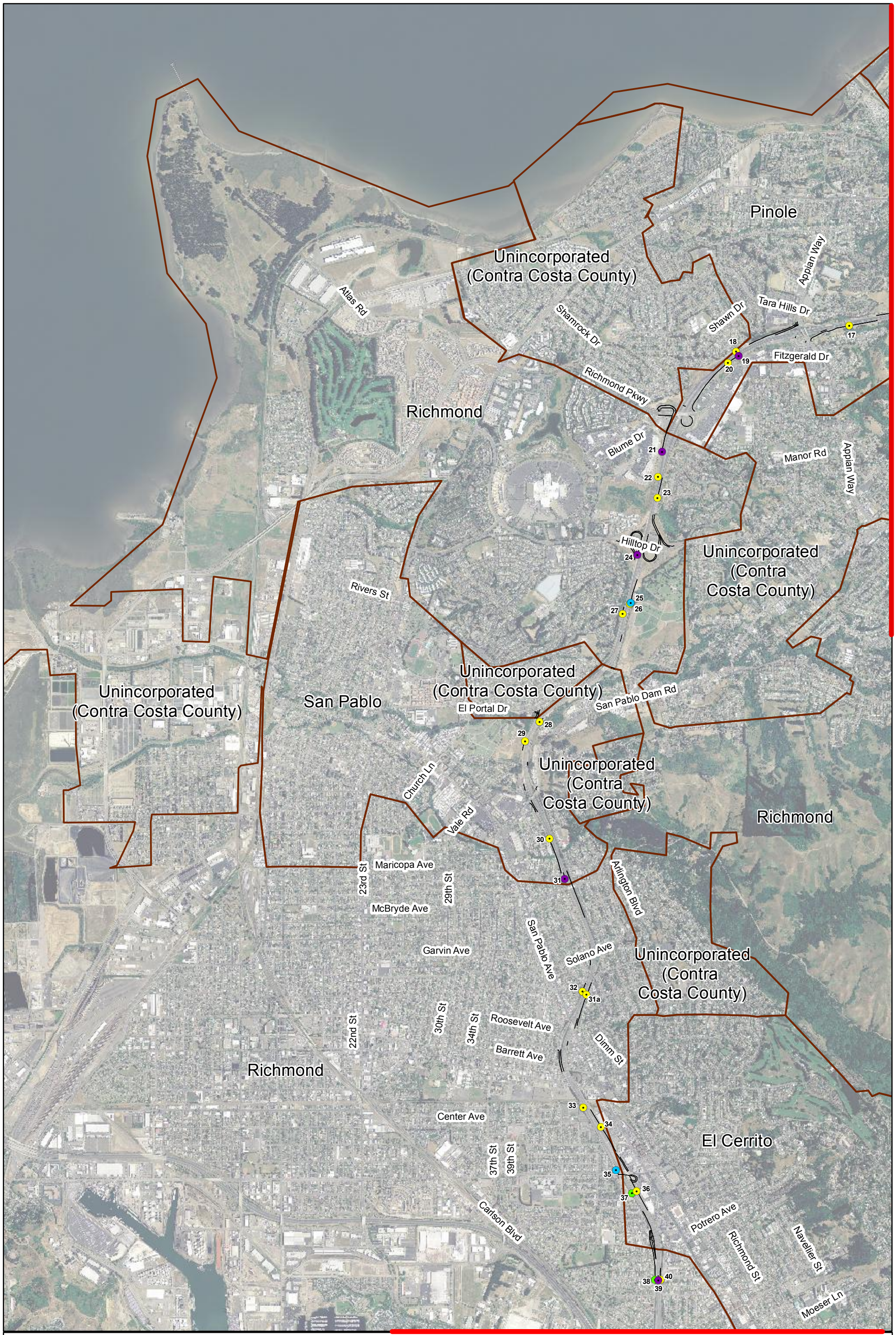
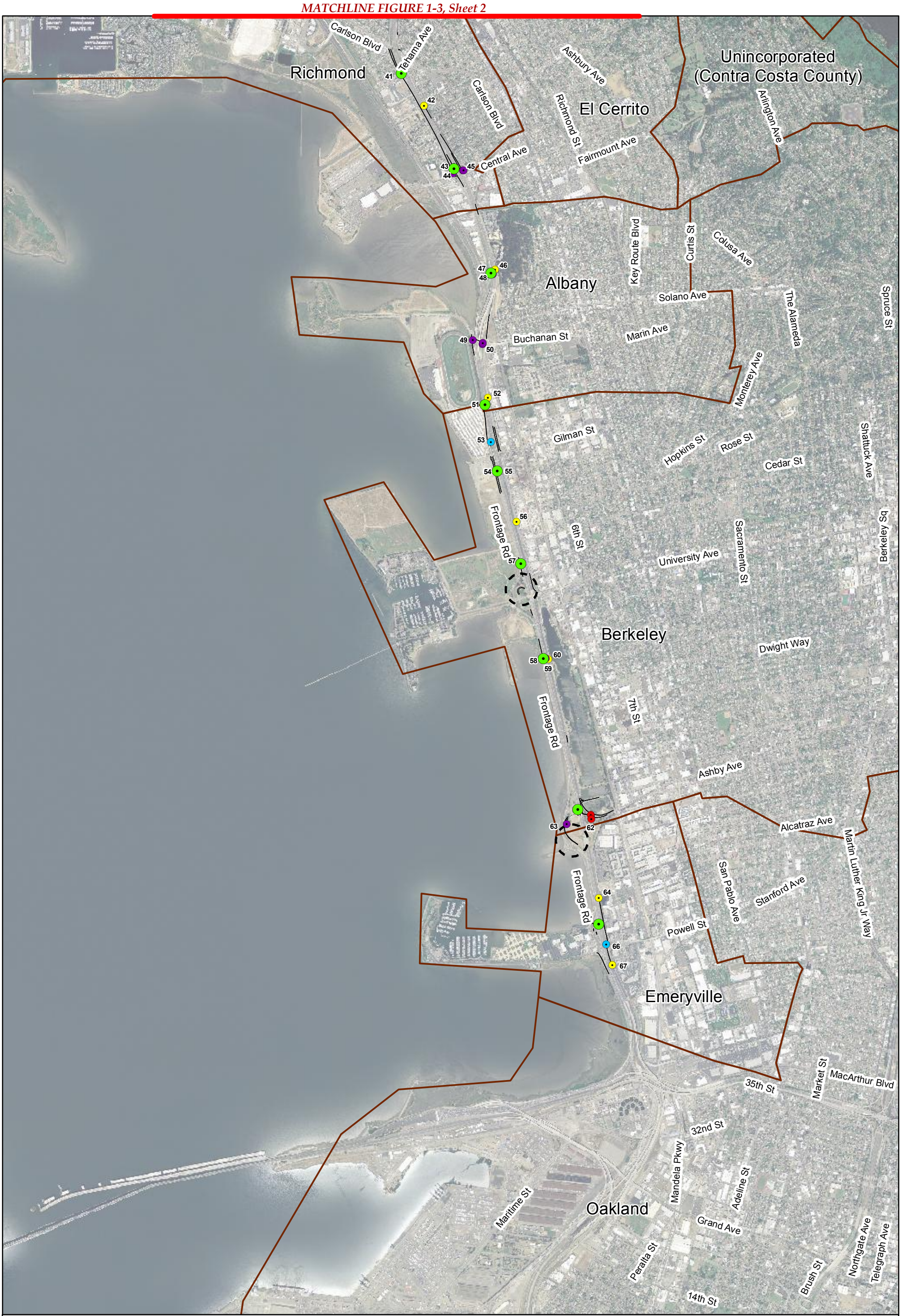


Figure 1-3
Sheet 2 of 3

Interstate 80 Integrated Corridor Mobility Project

DEVICE AND RAMP DISTURBANCE LOCATIONS

MATCHLINE FIGURE 1-3, Sheet 2



0 500 1,000 2,000 3,000 4,000 Feet

SOURCE: ©2004, Aerial Express Map

SIGN BRIDGE STRUCTURE (GANTRY)

INFORMATION DISPLAY BOARD

VARIABLE ADVISORY SPEED SIGN

VARIABLE MESSAGE SIGN (TYPE 1)

CLOSED CIRCUIT TELEVISION CAMERA

CONDUIT RUN

CITY BOUNDARY

LOCATION OF RAMP WIDENING FOR HOV PREFERENTIAL LANE

Figure 1-3
Sheet 3 of 3

Interstate 80 Integrated Corridor Mobility Project

DEVICE AND RAMP DISTURBANCE LOCATIONS

Lane Use Signal Sign - Sample Displays

Variable Message Sign (Type 2) - Sample Displays

Variable Advisory Speed Sign - Sample Displays

VARIES, BASED ON # OF FREWAY LANES

LANE USE SIGNAL

VARIABLE MESSAGE SIGN (TYPE 2)

REDUCE SPEED

VARIABLE ADVISORY SPEED SIGNS

REDUCE SPEED 55

LANE USE SIGNAL

LANE USE SIGNAL

REDUCE SPEED 55

VARIABLE ADVISORY SPEED SIGNS

18' - 6"

3'

12' TRAVEL LANE

12' TRAVEL LANE

12' TRAVEL LANE

12' TRAVEL LANE

12' TRAVEL LANE

NOT TO SCALE

FIGURE 1-4

Interstate 80 Integrated Corridor Mobility Project

SIGN BRIDGE STRUCTURE (GANTRY)

Information Display Board - Sample Displays

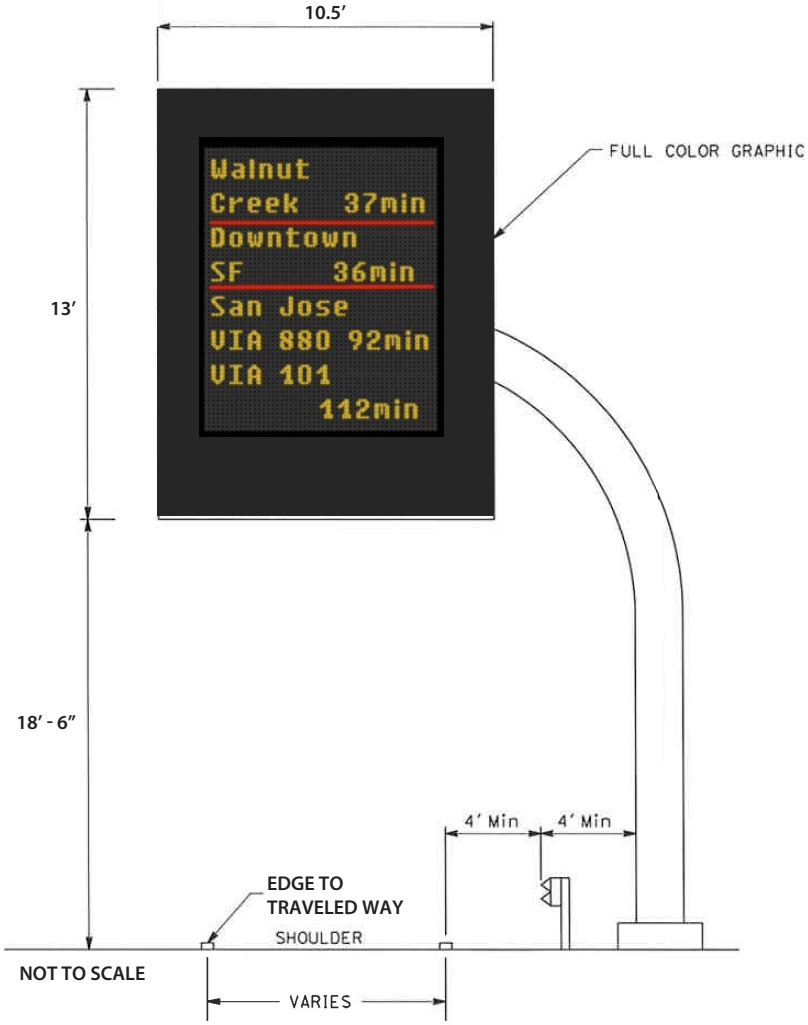


FIGURE 1-5

Interstate 80 Integrated Corridor Mobility Project

INFORMATION DISPLAY BOARD

Chapter 2

Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

2.1 Issues with No Adverse Impact

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

Land Use

Existing and Future Land Use

Construction of the project would occur predominately within the existing I-80 freeway right-of-way (ROW). As such, no residential, commercial, or other land uses would be directly affected (displaced) by the project. Because the project involves minor on-ramp improvements and the operation of intelligent transportation system equipment along the I-80 corridor, no indirect impacts to existing or future land uses are anticipated to occur from the project.

Consistency with State, Regional, and Local Plans and Programs

As stated above, no indirect impacts to existing or future land uses are anticipated to occur from the project. As such the project would not conflict with state, regional, or local land use planning documents.

The project is included in the FY 2010/2011 Metropolitan Transportation Commission's (MTC) Transportation Improvement Program (TIP) as project number ALA070041. MTC adopted the financially constrained TIP on October 27, 2010. Following approval by the Department, the Federal Highway Administration, and Federal Transit Administration, MTC approved the TIP on December 14, 2010 and incorporated it into the Federal Statewide Transportation Improvement Program. The project is also included in MTC's 2009 Regional Transportation Plan, *Transportation* 2035 (project number 23022).

In September 2010, the Department approved the I-80 ICM Corridor System Management Plan (CSMP). This is a transportation planning document that presents an analysis of existing and future traffic conditions and proposes traffic management strategies and capital improvements to maintain and enhance mobility within the project corridor.[1] The I-80 ICM project is one of the two near-term recommended projects and strategies included in the CSMP.

[1] CSMPs are being developed throughout the state for corridors within which funding is being used from the Corridor Mobility Improvement Account and Highway 99 Bond Programs created by the passage of the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, approved by the voters as Proposition 1B in November 2006. The intent is to eventually develop CSMPs for all urban freeway corridors.

Wild and Scenic Rivers

The project is not located in the vicinity of any rivers designated as part of the National Wild and Scenic Rivers System. As such, no wild or scenic rivers would be directly affected by construction or operation of the project.

Parks and Recreational Facilities

The project would not affect public access to any park or recreational facilities during construction or operation. Because the project involves minor on-ramp improvements and operating gantries within the I-80 right-of-way, no indirect noise or air quality impacts affecting parks or recreational facilities are anticipated to occur from the project.

Community Impacts

Community Character and Cohesion

The project would improve mobility and efficiency along the I-80 corridor during accidents and peak traffic hours. No new physical barriers would occur as a result of the project that would change existing access to the I-80 freeway.

The project is not expected to cause a change in social values because it would not alter land uses or community character, or result in population redistribution.

Relocations and Real Property Acquisition

Construction of the project would occur predominately within the existing I-80 freeway ROW. As such, no residential, commercial, or other land uses would be directly affected (displaced) by the project.

Environmental Justice

Due to the limited nature of the proposed improvements, and the fact that improvements are confined primarily to the I-80 ROW, the project would not cause disproportionately high and adverse effects to any minority or low-income population, as identified per Executive Order 12898 regarding environmental justice.

Growth

The project would not add capacity to the freeway main line, on-ramps, or parallel arterials nor would it provide new or altered accessibility to commercial or residential land uses along the I-80 corridor. The project would not stimulate new development or alter ongoing development patterns along the I-80 corridor.

Construction activities could result in a short-term increase in construction-related job opportunities in the project vicinity. However, the construction job opportunities would not result in the permanent relocation of construction workers. Furthermore, this increase in construction jobs would be minimal compared to overall employment growth rates for the region.

Farmlands and Timberlands

There is no land used for, designated as, or zoned as agricultural or timberland in the project corridor or in the project vicinity. Therefore, no farmland or timberland would be affected by the project.

Utilities and Emergency Services

Utilities

As discussed in the Draft Project Report (Department, 2010b), the project would not involve the relocation of any existing utilities. Any potential utility conflicts identified during the design phase would be avoided by relocating project components to locations not in conflict and not containing any sensitive environmental resources. Coordination with all utility agencies within the footprint of the project would continue during the design and construction phases of the project to ensure that all utilities would be avoided. No adverse impact with respect to utilities is anticipated.

Emergency Services

Police and fire services in the unincorporated areas along the project corridor are provided by Alameda and Contra Costa counties. Each of the cities adjacent to I-80 (i.e., Hercules, Pinole, San Pablo, Richmond, El Cerrito, Albany, Berkeley, and Emeryville) maintains its own police department. All cities, with the exception of San Pablo and Hercules, maintain their own fire departments. Fire service in San Pablo is provided by the Contra Costa County Fire Protection District and fire service in Hercules is provided by the Rodeo-Hercules Fire Protection District.

Project implementation is anticipated to reduce congestion within the I-80 corridor, thereby improving safety for motorists and maintenance workers. This would, in turn, decrease the number of accidents to which emergency service providers would have to respond. Moreover, the reduction in congestion would help emergency crews reach destinations along I-80 faster.

Project construction may result in a temporary increase in localized delays and congestion at some locations in the I-80 corridor. These impacts, however, are considered temporary and are not expected to be significant adverse effects to emergency services.

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2.2 Human Environment

2.2.1 Land Use

2.2.1.1 Coastal Zone

2.2.1.1.1 Regulatory Setting

This project is in the coastal zone. The Coastal Zone Management Act of 1972 (CZMA) is the primary federal law enacted to preserve and protect coastal resources. The CZMA sets up a program under which coastal states are encouraged to develop coastal management programs. States with an approved coastal management plan are able to review federal permits and activities to determine if they are consistent with the state's management plan.

California has developed a coastal zone management plan and has enacted its own law, the California Coastal Act of 1976, to protect the coastline. The policies established by the California Coastal Act are similar to those for the CZMA; they include the protection and expansion of public access and recreation, the protection, enhancement and restoration of environmentally sensitive areas, protection of agricultural lands, the protection of scenic beauty, and the protection of property and life from coastal hazards. The California Coastal Commission is responsible for implementation and oversight under the California Coastal Act.

The Bay Conservation and Development Commission (BCDC), created prior to the California Coastal Act, retains oversight and planning responsibilities for development and conservation of coastal resources in the Bay Area. The regulatory authority for BCDC is the McAteer-Petris Act and the Suisun Marsh Protection Act.

2.2.1.1.2 Affected Environment

The BCDC jurisdiction along the coastal zone extends approximately 100 feet inland from the shoreline of the San Francisco Bay. Portions of the Build Alternative that would be within the BCDC jurisdiction are shown in detail in **Appendix D**.[2]

2.2.1.1.3 Environmental Consequences

Build Alternative

Table 2.2-1 lists the maximum permanent and temporary ground disturbance that would occur within BCDC's jurisdiction under the Build Alternative. Permanent impacts were calculated based on the ground disturbance for each Build Alternative component, as described in Chapter 1. Temporary ground disturbance would be associated with the conduit installation and has been estimated using a uniform 20-foot-wide construction vehicle corridor. Open trench conduit installation is calculated for the entire length of the conduit run. Horizontal directional drilling (HDD) conduit installation (see Chapter 1) is measured at 25 feet in length for each pull box.

[2] The elevation of the BCDC jurisdiction was determined in accordance with the memo "Summary of Tide Station Data/BCDC McAteer-Petris Act Jurisdiction" (BCDC, June 23, 2006).

Table 2.2-1: Proposed Build Alternative Components within BCDC Jurisdiction

Location	Elements	Maximum Ground Disturbance (ft^2)[1]	
		Permanent	Temporary
Powell Street diagonal on-ramp to I-80 westbound (Stations 190+0 to 190+6)	600 ft. of conduit	-	2,500[2]
	1 ramp meter signal	3.1	-
	5 loop detectors	-	-
	6 pull boxes	32.6	-
	1 controller cabinet	38.4	-
	1 meter on sign	3.1	-
Between Ashby Avenue and University Avenue (Stations 280+4 through 290+1)	1 gantry[4]	19.6	-
	600 ft. of conduit	-	1,000
	2 pull boxes	10.9	-
	One CCTV Camera[5]	-	-
	2 sets of loop detectors in I-80 WB lanes	-	-
Buchanan Street on-ramp to I-80 westbound (Stations 360+0 to 380+1)	270 ft. of conduit	-	5,400[6]
	1 ramp meter signal	3.1	
	2 meter on signs	6.2	
	4 pull boxes	21.8	
	1 controller cabinet	38.4	
	2 sets of loop detectors in I-80 WB lanes	-	-
TOTAL:		177.2	8,900

Notes:

[1] Note that none of the project components within the BCDC jurisdiction would disturb any coastal salt marsh or other sensitive habitat.

[2] HDD conduit installation with a construction footprint of 20 ft. wide by 25 ft. long at each pull box.

[3] Pull boxes from two parallel conduit runs.

[4] This includes only the gantry footings, on the west side of I-80.

[5] Camera attached to gantry.

[6] To be constructed using open trench method.

No-Build Alternative

The No-Build Alternative would include planned and funded improvements along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same general location as the project, it is likely that the No-Build Alternative would result in similar impacts related to ground disturbance within BCDC's jurisdiction as the Build Alternative. A calculation of the acreages affected by these improvements would be determined under separate environmental review.

2.2.1.1.4 Avoidance, Minimization, and/or Mitigation Measures

Implementation of the Build Alternative and associated construction activity within the coastal zone would require a coastal development permit from BCDC. In accordance with the BCDC permitting process, an application for the coastal permit shall occur after the certification of the environmental document and after all government agencies have granted their preliminary approvals (permits) for the project, as appropriate.

2.2.2 Traffic and Transportation

This section discusses the project's effects on motor vehicle traffic and circulation. Information in this section is based on the *Traffic Operations Analysis Report, I-80 Integrated Corridor Mobility*, prepared in January 2011 (Department, 2011c). The study area for the traffic analysis encompasses approximately 19.5 miles of the I-80 freeway corridor, from the Carquinez Bridge to the I-80/I-580/I-880 Interchange (commonly known as the "Maze").

Traffic conditions are presented for both recurring (non-accident/incident) and incident-related traffic congestion scenarios (e.g., vehicle breakdown, collision, etc.). The following measures of effectiveness are used to demonstrate traffic conditions within the corridor transportation network[3]:

- **Travel Time -** Peak period[4] vehicle hours of delay
- **Peak Period Performance -** Peak period average vehicle speed
- **Safety -** Accident rates
  Intersection Operations - Peak hour[5] level of service (LOS) at selected intersections adjacent to on-ramps.

2.2.2.1.1 Affected Environment

Existing Conditions

The I-80 corridor has been identified as one of the most congested corridors in the entire San Francisco Bay Area, with traffic volumes reaching 312,000 vehicles per day and an average of 7,500 hours of daily traffic delays.

[3] The transportation network evaluated in the Traffic Operations Analysis Report includes the I-80 freeway between the San Francisco-Oakland Bay Bridge Toll Plaza in Oakland and the Carquinez Bridge in Crockett. The network also includes all the interchanges and freeway-to-freeway connectors along I-80 (i.e., I-880, I-580, and SR-4), the major alternative parallel arterial (San Pablo Avenue), the roadway connectors between I-80 and San Pablo Avenue, and selected local intersections.
[4] Peak period is defined as weekdays from 6:00 AM to 10:00 AM., and from 2:00 PM to 7:00 PM.
[5] Peak hour denotes the hour with highest traffic volume within the corresponding peak period AM (6:00 AM to 10:00 AM) or PM (2:00 PM to 7:00 PM). As a result, the peak hour may vary by location.

Under existing conditions, substantial traffic congestion exists along westbound I-80 during the morning peak period (6:00 AM to 10:00 AM), due to high travel demand and lack of available capacity at several interchanges including The Maze, Powell Street, I-580, San Pablo Dam Road, and Pinole Valley Road interchanges. Substantial traffic congestion exists along eastbound I-80 during the evening peak period (2:00 PM to 7:00 PM), especially near the interchanges with I-580, Carlson Boulevard, San Pablo Avenue, and State Route 4 (SR-4). Currently, it takes an average of 24 minutes in the morning peak period to travel from SR-4 to The Maze, a distance of approximately 16 miles. In the evening, the eastbound return trip takes an average of 25 minutes. These travel times translate into an average travel speed of 40 miles per hour (mph).

Traffic Accidents

The information contained in the Department's Traffic Accident Surveillance and Analysis System database indicates there were 6,285 recorded accidents in the project corridor between November 2004 and October 2007. Approximately 60 percent of these accidents occurred in the westbound lanes, while approximately 40 percent occurred in the eastbound lanes. Approximately 76 percent of the accidents involved property damage only, while 24 percent involved injuries (0.5 percent involved fatalities). As indicated in **Table 2.2-2**, the accident rate for the majority of the project corridor is above the statewide average. More than half of the accidents occurred between the San Francisco-Oakland Bay Bridge Toll Plaza and I-580. The accident rate on the segment of I-80 between the Powell Street Interchange and I-580 is nearly 80 percent higher than the statewide average for similar freeway facilities.

Table 2.2-2: Accident Rate by Segment

Limits	Number of Accidents	Accident Rate	State-wide Average Accident Rate
San Francisco-Oakland Bay Bridge Toll Plaza/Powell Street Interchange	926	2.06	1.32
Powell Street Interchange/Buchanan-580	2,270	2.18	1.22
580-Buchanan/San Pablo Dam Road	1,077	0.97	1.19
San Pablo Dam Road/SR-4	1,290	1.18	1.00
SR-4/Carquinez Bridge	722	0.99	1.03

Note: "Accident Rate" is the number of accidents per million vehicle-miles. "State-wide Average Accident Rate" is the average accident rate from similar freeway segments in California.

2.2.2.2 Environmental Consequences

Build Alternative

Year 2015 Recurring (Non-Accident/Incident) Conditions

The Build Alternative would result in a decrease in vehicle hours of delay and a corresponding increase in vehicle speed.

Vehicle Hours of Delay and Average Vehicle Speed

Table 2.2-3 provides a comparison of vehicle hours of delay and average vehicle speed under Year 2015 Build and No-Build Alternative conditions in the morning peak period. **Table 2.2-4** provides this data for the evening peak period. The analysis in these tables is based on recurring (non-accident/incident) conditions, and does not assume the traffic congestion that occurs in the project corridor as a result of traffic incidents. The analysis of the Build Alternative conditions is an evaluation of the combined effects of all of the proposed project components described in Chapter 1 (i.e., operation of the gantry signs, stand alone features, and implementation of adaptive ramp metering).

At the time the traffic analysis was conducted, the specific adaptive ramp metering algorithm to be used for this project had not been selected. The existing ramp metering system used by the Department throughout the Bay Area is the Traffic Operations System (TOS) v2 program, which allows ramp meters to be operated under local traffic-responsive control. Since this traffic analysis used traffic forecasts that represent fixed or steady state demand conditions, an adaptive ramp metering system or locally traffic-responsive system would yield very similar operational results. Due to the uncertainty regarding the adaptive algorithm and the ready availability of a TOS ramp metering software module for the simulation model used for the analysis, the analysis is based on the application of the TOS ramp metering algorithm. For the purposes of this report, an analysis based on the TOS ramp metering algorithm would be a reasonable approximation of an adaptive metering system under the conditions that were analyzed.

Table 2.2-3: Year 2015 Vehicle Hours of Delay and Average Speed (AM Peak Period)

Transportation Network Component	Year 2015 No-Build	Year 2015 Build Alternative	
Vehicle Hours of Delay (Hours)			
Network-wide	13,400	12,300	-8%
Freeway	6,900	5,400	-22%
Ramp	700	1,000	43%
Arterial	5,800	5,900	2%
Average Speed (mph)			
Network-wide	32.9	33.6	2%
Freeway	41.0	43.0	5%
Ramp	20.9	16.1	-23%
Arterial	17.6	17.4	-1%

Table 2.2-4: Year 2015 Vehicle Hours of Delay and Average Speed (PM Peak Period)

Transportation Network Component	Year 2015 No-Build	Year 2015 Build Alternative	
Vehicle Hours of Delay (Hours)			
Network-wide	36,400	33,400	-8%
Freeway	24,400	22,000	-10%
Ramp	1,300	1,400	8%
Arterial	10,600	10,000	-6%
Average Speed (mph)			
Network-wide	23.2	24.4	5%
Freeway	26.5	28.1	6%
Ramp	17.8	16.6	-7%
Arterial	16.1	16.8	4%

The Build Alternative is expected to result in an 8 percent reduction in network-wide vehicle hours of delay during both the morning and evening peak periods. With regard to traffic on the I-80 freeway portion of the transportation network, the Build Alternative would reduce vehicle hours of delay by 22 percent in the morning peak period and by 10 percent in the evening peak period. The reduction in delay is achieved by the provision of real time traveler information, and by the implementation of adaptive ramp metering.

The implementation of ramp metering will cause vehicle hours of delay on the ramps themselves to increase by 43 percent in the morning peak period and by 8 percent in the evening peak period. However, overall travel times for a broad sample of trips within the project corridor indicate that, in most cases, ramp meter delay would be offset by mainline speed improvements, resulting in negligible change in overall travel time for the individual motorist.

In terms of average vehicle speed, the Build Alternative would result in a 2 percent increase in speed network-wide in the morning peak period, and a 5 percent increase in speed during the evening peak period. This correlates to an increase in speed of 0.7 miles per hour in the morning and 1.2 miles per hour in the evening. Speeds on the I-80 freeway portion of the network would increase by 5 percent (2.0 miles per hour) during the morning peak period and by 6 percent (1.6 miles per hour) in the evening peak period. Due to the installation of ramp meters, average speed on freeway ramps would be reduced by 23 percent (4.8 miles per hour) in the morning peak period and by 7 percent (1.2 miles per hour) in the evening peak period. Arterial speed would be reduced by 1 percent in the morning (0.2 miles per hour) but would increase by 4 percent (0.7 miles per hour) in the evening.

Diversion

During non-incident conditions, there would be a very low potential for motorists to divert from the I-80 freeway to parallel arterial routes because freeway mainline speeds would increase significantly with the project, thus encouraging vehicles to stay on the freeway.

Ramp metering may induce motorists on local streets to divert away from using the freeway because of delays caused at the ramp meter. To quantify the potential diversion due to ramp metering, a travel demand model was run for the entire project corridor, which included the incorporation of ramp metering on the I-80 westbound on-ramps. This model utilized the same ramp metering function already applied to metered ramps along I-880 and I-580 corridors. Modifications were made to reflect the Build Alternative's proposed meter designs and expected metering rates for the individual ramps along I-80 westbound during the peak periods.

The modeling results show negligible diversion to the arterial routes for freeway-bound trips due to ramp metering, with no increase greater than 80 vehicles or 4 percent. In fact, the model results show there would be a net shift of traffic toward the freeway from the parallel arterials, with arterial demands decreasing by over 6 percent at some locations. This model result indicates that the delay incurred by motorists at the ramp meter will be out-weighed by the overall travel time benefit of using the freeway for their trip. This outcome would likely improve local street operations at the ramp terminus intersections.

Peak Hour Intersection LOS – Ramp Meter Storage and Queuing

Level of Service is a measure of actual traffic conditions and the perception of such conditions by motorists. There are six levels of service, ranging from LOS A (free traffic flow with low volumes and high speeds resulting in low densities) to LOS F (traffic volumes exceed capacity and result in forced flow operations at low speeds resulting in high densities). **Table 2.2.-5** shows the control delay associated with each LOS grade for intersections that are controlled by traffic signals. LOS is used in this traffic analysis to evaluate effects at intersections with freeway ramp metering.

Table 2.2-5: LOS for Signalized Intersections

Level of Service (LOS)	Delay per Vehicle (seconds)
A	10 (or less)
B	11-20
C	21-35
D	36-55
E	56-80
F	80 (or more)

As discussed in Chapter 1, the Build Alternative would incorporate adaptive ramp metering technology. The term "adaptive" refers to the ability of the ramp metering system to adjust the "green rate" based on traffic flows in the mainline and ramp queuing. For example, if the system detects (through detection loops in the pavement) that the ramp queue is overflowing onto the local arterials, the ramp meters increase the frequency of green lights until the overflow is cleared. The ramp metering rates vary based on actual freeway and ramp volumes to increase or decrease the discharge of vehicles onto the freeway, thereby reducing potential surface street impacts.

The I-80 ICM Project would not generate new trips and, according to the diversion analysis, is not expected to produce changes in travel patterns. The No Build and Build Alternative traffic demands at the local intersections surrounding the project corridor are projected to be the same. The project does not

include geometric modifications or changes in traffic control on the arterial network that may negatively impact the LOS conditions at local intersections during normal operating conditions. Intersection operating conditions are generally expected to be the same under both the No Build and Build Alternative conditions. A quantitative discussion of the LOS conditions for local intersections (beyond the I-80 ramp intersections discussed below) or surface streets was not necessary.

Vehicle hours of delay on the ramps to I-80 would increase by 43 percent in the morning peak period and by 8 percent in the evening peak period. At the ramps, metering would result in average delays of approximately 30 seconds, although increases of up to two minutes are projected at a few locations. In order to determine the potential effects of freeway on-ramp metering on intersection operations, peak hour intersection capacity analysis was performed at 30 on-ramp intersections. **Table 2.2-6** presents the results of this analysis, which suggests that the operation of ramp meters would not cause an adverse impact to the intersection LOS (defined as an intersection operating at LOS D or better to deteriorate to a congested LOS E or LOS F).[7]

Several of the local intersections expected to operate at an unacceptable LOS E or LOS F under 2015 No-Build conditions would experience additional delay due to the installation of the ramp meters. At these intersections, the traffic implications presented in **Table 2.2-6** were also evaluated in terms of local LOS thresholds for intersections currently operating at an unacceptable LOS, which use an intersections' change in volume to capacity ratio (v/c) as the measure of effectiveness in determining significant adverse impacts.[8] Although a few of the local intersections would experience an increase in delay, implementation of the systems management strategies (adaptive ramp metering and incident management) would not generate new traffic volumes in the project corridor. In addition, the project is not anticipated to result in the diversion of vehicles to the freeway on-ramps, further reducing the potential to affect the traffic volumes at the local intersections. Because the project is not anticipated to generate and/or divert traffic volumes to the intersections within the project corridor, the proposed improvements would not affect the v/c ratios at the intersections already operating at an unacceptable LOS, and no significant adverse effects would occur under local LOS thresholds.

As described above, delays associated with the installation of ramp metering are more than offset by the improvement to freeway mainline operations. Although motorists would experience delays at freeway on-ramps due to the ramp meters, there would be an overall network-wide travel time savings due to the improved freeway operation.

[7] All of the local jurisdictions in which the study intersections are located define a significant negative impact as an intersection operating at LOS D or better deteriorating to a congested LOS E or LOS F.

[8] The volume to capacity ratio (v/c) is a measure of the number of vehicles to the capacity of the transportation facility. All local jurisdictions (including Pinole, Richmond, and Emeryville) utilize similar criteria for evaluating the significance of traffic impacts at intersections already operating an unacceptable level of service, which is defined as an increase (1 percent or more) in the affected intersections v/c ratio.

Table 2.2-6: Traffic Implications of Ramp Meter Installation – Year 2015

Intersection	AM Peak Hour			PM Peak Hour		
	No-Build Alternative	Build Alternative	Change in Delay * (seconds)	No-Build Alternative	Build Alternative	Change in Delay * (seconds)
San Pablo Ave. at John Muir Pkwy.	C	C	-6.1	C	C	1.3
San Pablo Ave. at Sycamore Ave.	E	E	-1.6	B	C	4.5
Sycamore Ave. at Willow Ave.	F	F	-30.8	A	A	0.2
San Pablo Ave. at Hercules	B	B	0.0	B	B	0.4
Pinole Rd at WB 80 Ramps	E	E	-8.3	C	C	-0.8
Pinole Rd at EB 80 Ramps	C	C	-6.2	B	C	2.8
Appian Way at WB 80 Off-ramps	C	C	2.2	C	C	-0.5
Appian Way at Tara Hills Dr.**	F	F	12.2	C	C	-0.4
Appian Way at EB 80 Ramps	C	C	1.4	A	A	-0.9
San Pablo Dam Rd at EB 80 On-ramp	C	C	7.3	C	C	-0.9
San Pablo Dam Rd. at WB 80 Ramps	B	C	9.1	B	B	-3.5
San Pablo Ave. at Roosevelt Ave.	B	B	-0.2	D	D	10.1
San Pablo Ave. at Barrett Ave.	C	C	-0.7	D	D	-10.5
Barrett Ave. at WB 80 Ramps	C	C	0.6	F	F	-5.7
Carlson Blvd. at EB 80 Ramps	A	A	0.0	A	A	-0.6
Carlson Blvd. at WB 80 Ramps	A	A	-0.4	A	A	0.5
Central Ave. at EB 80 Ramps	B	C	4.3	C	C	-2.9
Central Ave. at WB 80 Ramps	B	B	3.6	C	C	-4.4
Central Ave. at Pierce St.**	C	D	3.7	F	F	64.0
Buchanan St. at WB 80 Ramps	F	E	-27.5	D	D	9.9
Buchanan St. at EB 80 Ramps	D	C	-11.9	C	C	11.0
San Pablo Ave. at Marin Ave.	E	E	-3.6	D	D	-0.3
University Ave. at Frontage Rd.	A	A	-0.5	A	A	-0.1
University Ave. at 6th St.	C	C	-0.2	C	C	-5.4
Ashby Ave. at 7th St.	C	C	0.5	D	D	-12.7
Frontage Rd. at WB 80 Ramp to Powell St.	C	C	2.3	D	D	-9.0
Powell St. at Frontage Rd.**	B	B	-0.3	E	E	2.2
Powell St. at EB 80 Ramps	D	D	-0.5	D	D	-3.9
Powell St. at Hollis St.	E	E	-9.1	F	F	-54.6
San Pablo Ave. at Powell St.	D	D	3.3	E	D	-15.5

Notes:

* A negative number indicates that delay is reduced with the Build Alternative.

** An intersection that currently operates at unacceptable LOS conditions, and would experience further delay as a result of the project, was also evaluated in terms of local LOS criteria (v/c ratio). No significant adverse effects would occur.

Year 2015 during Incident Conditions

Vehicle Hours of Delay and Average Travel Time

While the benefits described above apply to recurring (non-accident/incident) traffic conditions, a major objective of the project is to also reduce the impact of non-recurring or incident-related traffic congestion (see Chapter 1). Signs installed on the gantries would reduce traffic congestion during incident conditions. Previous studies have found that if drivers are aware of lane-blocking incidents downstream, they can reduce traffic congestion by gradually merging into adjacent lanes and avoiding last-second forced merging, which can lead to secondary accidents.[9] The operation of the lane use signals and variable message signs would inform drivers to merge into other lanes prior to an accident scene. These signs facilitate merging for traffic entering I-80 from on-ramps.

Variable advisory speed signs would display lower advisory speeds prior to incident-related congestion to slow traffic ahead of time, thereby reducing rear-end collisions. This technique is known as "end of queue warning." The stand-alone variable message signs would provide advanced warning to motorists that the ramp meter is in operation. These signs would reduce rear-end collisions by warning drivers of slow traffic speeds at the ramp meters.

In order to assess the performance of the Build Alternative under incident conditions, the traffic model included an incident scenario between 8:00 AM and 9:00 PM along westbound I-80 between the University Avenue and Ashby Avenue interchanges. Under this incident scenario, the model results indicate that the Build Alternative would reduce vehicle hours of delay on westbound I-80 by 12 percent, as compared to the No-Build scenario. Similarly, average travel time from the Carquinez Bridge to The Maze would decrease by 13 percent along westbound I-80 assuming an incident (see **Table 2.2-7**).

Improvements to vehicle hours of delay and travel time under the incident scenario would be expected to facilitate emergency response operations, thereby decreasing incident recovery time and related traffic congestion. Reducing traffic congestion related to accident-related traffic would result in less variability in travel times within the project corridor. This would result in an increase in travel time reliability.

Table 2.2-7: Westbound I-80 Performance – Incident Conditions (8:00 AM to 9:00 AM)

Network Wide	Year 2015 No-Build	Year 2015 Build Alternative	
Vehicle Hours of Delay (Hours)	1,765	1,550	-12%
Average Travel Time, Carquinez Bridge to The Maze (Minutes)	46.3	40.3	-13%

Diversion

Increased speeds and reduced delays on I-80 during a traffic incident would be expected to reduce the incentive of motorists to divert to parallel surface routes. However, the lane use signals will alert drivers well in advance of an incident as to the location of upcoming congestion, and variable advisory speed signs will suggest appropriate speeds to smooth out traffic flow. The information display boards would provide information and updates on the availability of parking and transit options or alternate freeway

[9] Mercer Island Reporter, April 27, 2010. WSDOT adds electronic signs to manage lanes on regional interstate highways. Available at: http://www.pnwlocalnews.com/east_king/mir/news/92201899.html; Last accessed: March 30, 2011.

routes, which will allow motorists to choose an alternate freeway route or transit mode (BART or buses) to complete their trip. This type of information would also result in more reliable expectations regarding travel times.

Studies have shown that when drivers know travel times in advance, they can select the fastest route and/or alternate mode of transportation (like transit), and avoid contributing to already congested routes.[10] One San Francisco Bay Area study shows that up to approximately 8 percent of drivers change their mode of travel based on transit travel information displayed on freeway signs.[11] Related projects include features, such as the trailblazer signs along the San Pablo corridor, that will help manage traffic flow along arterial roadways in the event of a major incident, so motorists will be able to avoid an incident and return to the freeway more efficiently, downstream of the incident location.

Accidents

No methodology exists that can accurately predict future accident patterns on freeway mainlines. To gain some insight on the potential safety benefits of the project, a literature review was conducted studying the accident histories of locations where the system management strategies proposed under the I-80 ICM project have been implemented. The results of this review indicate that the implementation of the system management strategies proposed under the I-80 ICM project would be expected to result in safety or incident reduction benefits, as discussed below.

Adaptive ramp metering is expected to reduce traffic collisions in merge areas by breaking up "platoons"[12] and controlling the entry of vehicles onto the freeway, resulting in fewer side-swipe and merge-related collisions. Ramp metering is also expected to reduce stop-and-go driving behavior along the freeway, resulting in fewer rear-end collisions. Although it's not known what specific reduction in accidents will be achieved on the I-80 corridor, in areas where metering has been implemented, accident rate reductions of 20 percent to 50 percent have been reported.[13] However, studies conducted previously by the Department have shown that ramp metering can also lead to a short-term increase in on-ramp rear-end collisions. These increases generally dissipate as drivers become accustomed to the ramp meter operation.

The primary purpose of the active traffic management gantries and the variable advisory speed signs is to minimize variations in speed in different segments of the I-80 corridor. This is achieved by reducing the speed limit upstream of areas of traffic congestion or incidents. This strategy typically results in a reduction in the number of collisions caused by sudden changes in speed and by abrupt lane changes.

When the components described above are combined, a reduction in the accident rate along I-80 may be achieved. The benefits of an accident rate reduction include a lower number of injuries and fatalities, a decrease in property damage costs, and a reduction in incident-related traffic congestion. In corridors such as I-80, incident-related traffic congestion makes up approximately half of the total delay on the freeway. Therefore, a reduction in the number of incidents can also lead to a reduction in the total hours

[10] Mercer Island Reporter, April 27, 2010. WSDOT adds electronic signs to manage lanes on regional interstate highways. Available at: http://www.pnwlocalnews.com/east_king/mir/news/92201899.html; Last accessed: March 30, 2011.
[11] California Center for Innovative Transportation, 2009. Travel Times on Changeable Message Signs Volume II – Evaluation of Transit Signs.
[12] Platoons are defined as groups of vehicles traveling together in a dense formation.
[13] Freeway Management and Operations Handbook, FHWA, 2003 (revised 2006).

of delay experienced in the I-80 corridor. Such a reduction would facilitate fulfillment of the project purpose of decreasing traffic incidents, including secondary accidents – thereby improving traffic safety and reducing incident/accident-related delays/congestion.

Construction Impacts

Construction of the Build Alternative would begin in 2012, with an anticipated completion date of 2014. Temporary traffic impacts would occur due to lane closures within the I-80 right-of-way to accommodate construction activities.

ADA Compliance

The Build Alternative would comply with the Americans with Disabilities Act (ADA) by replacing existing curb ramps with ADA-compliant curb ramps during modification of freeway on-ramps.

No-Build Alternative

The No-Build Alternative would include some planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza, as described in Chapter 1. Because the use of this already congested corridor would continue to increase, traffic congestion would worsen under the No-Build Alternative relative to the Build Alternative. Under 2015 No-Build Alternative conditions, freeway vehicle hours of delay would be higher under recurring (non-accident/incident) conditions and freeway average vehicle speeds would be lower, as compared to the Build Alternative. The No-Build Alternative would not provide any ramp meters, active traffic management gantries, variable advisory speed signs or other components that would improve traffic conditions in the event of an incident and reduce weave/merge conflicts during non-incident periods. While the No-Build Alternative would improve some access points to the mainline through improvements to select on-ramps and interchanges, the planned projects included in the No-Build Alternative would not address overall traffic congestion on the I-80 mainline.

2.2.2.3 Avoidance, Minimization, and/or Mitigation Measures

The Build Alternative is not expected to result in any adverse traffic or transportation effects; therefore, no avoidance, minimization, and/or mitigation measures are required.

During the Plans, Specifications, and Estimates (PS&E) phase of the project, a detailed Transportation Management Plan would be developed to facilitate access during construction. The objective of the Transportation Management Plan would be to minimize the impacts that construction activities would have on the traveling public. If during final design it is determined that any of the existing ramps would need to be closed for more than 10 consecutive days, a ramp closure study would be performed and the appropriate management strategies would be implemented. When needed, due to lane closures, temporary routes would be available and designated for use as a detour.

2.2.3 Visual/Aesthetics

2.2.3.1 Regulatory Setting

The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 USC 4331[b][2]). To further emphasize this point, the Federal Highway administration in its implementation of NEPA (23 USC 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

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

2.2.3.2 Affected Environment

Information in this section is based on the *Visual Impact Assessment* approved in February 2011 (Department, 2011a). The visual impact assessment was prepared in accordance with the guidelines in the Federal Highway Administration's *Visual Impact Assessment for Highway Projects* (FHWA, 1981). The study area for visual resources includes the I-80 corridor and immediately surrounding land uses from the Carquinez Bridge to the San Francisco-Oakland Bay Bridge Toll Plaza.

Local Policies and Guidelines

The following local policies and guidelines are relevant to the visual context of the project.

BCDC Public Access Design Guidelines

2. Roads and Highways along the Shoreline

- Plan roads to keep Bay and access areas in view as much as possible, especially where roads change direction.
- Provide buffers between roadways and public access areas, such as planting, low berms or roadside parking, and maintain views to the Bay.
- Provide pedestrian and bicycle facilities adjacent to highway and roadway projects to promote alternative modes of transportation.

City of Berkeley General Plan (2003)

Open Space (OS) Element

Policy OS-13: Waterfront Open Space and Recreational Facilities

Implement the 1986 Waterfront Plan policies to establish the waterfront as an area primarily for recreational, open space, and environmental uses, with preservation and enhancement of beaches, marshes, and other natural habitats.

Action B: Assure that new development along the shoreline recognizes its unique location, considers sensitive natural resources, and maintains adequate shoreline access and views.

Emeryville General Plan (2009)

Urban Design (UD)

Policy UD-P-29: Public views of the San Francisco Bay and the East Bay hills shall be maintained.

Visual Setting

The visual setting of the study area varies considerably along the I-80 corridor from the Carquinez Bridge to the San Francisco-Oakland Bay Bridge Toll Plaza. The northern portion of the study area, spanning from the community of Crockett to the City of San Pablo, is located in a suburban environment with rolling hills. Hillsides have been significantly altered to accommodate residential, commercial, institutional, office, and industrial land uses. Most of the development in this area occurs immediately adjacent to and farther west of the I-80 corridor.

The visual character of the remaining portion of the study area is much different. Land is relatively flat with few natural landforms to provide separation and screening between developments and communities. The majority of the study area can be characterized as a highly urbanized environment with a mixture of residential, commercial, office, institutional, and industrial land uses.

Even with substantial urban development, the San Francisco Bay represents a significant visual resource in the southern portion of the study area. Existing expansive and unobstructed views of the San Francisco Bay are available to motorists, residents, and recreational users. While most of the San Francisco Bay views are at grade along the I-80 corridor, the I-580/I-80 interchange has elevated views of the water and City of San Francisco.

Within the study area, the I-80 corridor is not a designated state scenic highway. However, the segment of I-80 from Powell Street to Central Avenue is identified as a scenic drive area in BCDC's Bay Plan.

Viewer Groups

The predominant viewer groups associated with I-80 are those with views from the freeway, such as motorists (commuters, local residents, tourists), and those with views of the freeway, such as residents and employees and/or users of adjacent commercial and light industrial land uses. Viewers' activity can affect their sensitivity to the views available of and from I-80. Viewer sensitivity is defined both as the viewer's concern for scenic quality and the viewer's response to change in the visual resources that comprise the view.

Existing Visual Quality

Visual quality is evaluated by identifying the vividness, intactness, and unity present in the viewshed. Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns. Intactness is the visual integrity of the natural and manmade landscape of the

immediate environs and its freedom from encroaching elements. Unity is the visual coherence and compositional harmony of the landscape considered as a whole. These criteria are used to determine whether the existing visual setting has high, moderate, or low overall visual quality.

Twenty viewpoints/view areas have been identified within the study area to evaluate the visual impacts of the Build Alternative. For each viewpoint/view area, the existing visual quality is described and rated for vividness, intactness, and unity. **Table 2.2-8** provides a summary of the existing visual quality of the study area by viewpoint/view area.

Overall, the existing visual quality for the study area is low to moderate. The presence of substantial amounts of development along the I-80 corridor, associated interchanges, and signage decreases and substantially detracts from the overall visual quality experienced by motorists and surrounding residents and workers. However, the existing uninterrupted views of San Francisco Bay in viewpoint/view areas 18, 19, and 20 are vivid with high visual quality.

Table 2.2-8: Existing Visual Quality Summary

Visual Quality			
	Vividness	**Intactness**	**Unity**
Viewpoint/View Area 1: South of the Carquinez Bridge and North of Cummings Skyway	Moderate	Moderate	Moderate
Viewpoint/View Area 2: Willow Avenue Interchange	Low	Moderate	Moderate
Viewpoint/View Area 3: State Route 4 Interchange	Moderate	Low	Low
Viewpoint/View Area 4: Pinole Valley Road Interchange	Moderate	Moderate	Moderate
Viewpoint/View Area 5: Appian Way Interchange	Moderate	Low	Low
Viewpoint/View Area 6: Richmond Parkway Interchange	Low	Low	Low
Viewpoint/View Area 7: Hilltop Drive Interchange	Moderate	Low	Moderate
Viewpoint/View Area 8: El Portal Drive Off- and On- Ramps	Low	Low	Low
Viewpoint/View Area 9: McBryde Avenue Interchange	Low	Low	Low
Viewpoint/View Area 10: South of Solano Avenue Interchange	Moderate	Low	Low
Viewpoint/View Area 11: South of San Pablo Avenue Interchange to Just South of MacDonald Avenue Interchange	Low	Low	Low
Viewpoint/View Area 12: Cutting Boulevard Interchange	Low	Low	Low
Viewpoint/View Area 13: Carlson Boulevard Interchange	Low	Low	Low
Viewpoint/View Area 14: Central Avenue Interchange	Low	Low	Low
Viewpoint/View Area 15: I-80/I-580 Crossing	Moderate	Low	Low
Viewpoint/View Area 16: North of Gilman Street Interchange	Low	Low	Low
Viewpoint/View Area 17: University Avenue Interchange	Low	Low	Low
Viewpoint/View Area 18: South of University Avenue Interchange	High	Moderate	Moderate
Viewpoint/View Area 19: South of Ashby Avenue Interchange	High	Moderate	Moderate
Viewpoint/View Area 20: Powell Street Interchange	High	Moderate	Moderate

2.2.3.3 Environmental Consequences

Build Alternative

Build Alternative components that would be constructed within the viewpoints/view areas are described and evaluated in terms of their impact on visual quality to determine a "with project" visual quality rating. The existing visual quality and project visual quality ratings are then compared to determine the Build Alternative's potential effects on visual resources in the study area.

The Build Alternative would implement minor on-ramp roadway improvements and would install and operate intelligent transportation system equipment along the I-80 corridor from the San Francisco-Oakland Bay Bridge Toll Plaza to the Carquinez Bridge. The improvements would occur at specific locations along the 19.5-mile corridor. Each of the intelligent transportation system components is discussed in detail in Chapter 1.

In general, the Build Alternative components that are small in scale and typical of the existing freeway corridor setting would be consistent with the visual character of the freeway corridor and would have little, if any, effect on visual quality including light and glare. There would be little or no visual impact associated with such features. The three ramp-widening improvement areas related to the HOV preferential lanes would not alter the existing character or visual quality of the freeway ramps, and no visual impact would occur.

The largest proposed Build Alternative components, including information display boards and gantry structures, would have the greatest potential effect on the visual quality of their setting because their size and placement within the freeway corridor would make them highly conspicuous and intrusive. In addition, the proposed information display boards with full color graphics would be inconsistent with the character of the freeway corridor within Contra Costa and Alameda counties.

The visual impact of the information display boards and gantry structures would be considered significant if these components would interfere with, detract from, or obstruct scenic views such as those of San Francisco Bay. If the Build Alternative components would not interfere with scenic views, their visual impacts are considered less than significant. A detailed analysis of the visual consequences of the Build Alternative from each viewpoint/view area is provided below. Visual simulations of the Build Alternative components proposed in several of the viewpoint/view areas are presented in **Figures 2-1A** through **2-1I**.

<u>Viewpoint/View Areas 1 through 17</u>

The existing visual quality of the study area in viewpoints/view areas 1 through 17 is low to moderate and there are no scenic views of or from the I-80 corridor. Installation of the smaller components of the Build Alternative in viewpoint/view areas 1 to 17 would be similar in nature to existing lighting and signage found along the I-80 corridor. As such, they would appear in context with the existing setting. The addition of the information display boards and gantries would have a moderate visual effect due to the size of the new features. There are no scenic views along this corridor or viewpoint/view areas 1 to 17. The existing setting includes lighting and signs on both sides of the freeway corridor. The Build

Alternative would not degrade the existing visual character or visual quality of viewpoint/view areas 1 through 17, or introduce substantial new sources of light or glare. The visual quality in this area would not change substantially.

Viewpoint/View Areas 18, 19, and 20

Three gantries and one information display board device would be located in viewpoint/view areas 18 to 20. These areas contain highly sensitive views of the San Francisco Bay and are defined as scenic drive areas in the BCDC Bay Plan.

As shown in **Figures 2-1F** and **2-1G**, the visual character of viewpoint/view area 18 is dominated by the expanse of I-80 and the pedestrian/bicycle bridge at University Avenue. This stretch of freeway between the University Avenue and Ashby Avenue interchanges offers unobstructed views of San Francisco Bay to the west. For eastbound motorists, views of San Francisco Bay are eventually blocked as they approach the University Avenue interchange bridge. Immediately beyond the bridge are views of the Berkeley Marina. The visual character of viewpoint/view area 19 is dominated by the expanse of I-80 (westbound) and is generally flat with mid- to high-rise developments on each side of the freeway. Unobstructed views of San Francisco Bay are available to the west. The visual character of viewpoint/view area 20 for motorists heading westbound includes light industrial, commercial, and high-density residential development to the east side of the freeway. A salt marsh and highly vivid views of San Francisco Bay are visible to the west from viewpoint/view area 20.

Gantry 4

As shown in **Figure 2-1F**, Gantry 4 would be placed in close proximity to the University Avenue interchange such that it would not interfere with eastbound motorists' unobstructed views of San Francisco Bay. Gantry 4 would only obstruct views of the interchange bridge and landforms surrounding the Berkeley Marina. In addition, removal of the existing sign from the median between Ashby Avenue and University Avenue would improve views of the San Francisco Bay for eastbound motorists. Gantry 4 would not block views of the San Francisco Bay from the existing University Avenue pedestrian/bicycle overcrossing.

For westbound motorists, Gantry 4 would appear after passing under the University Avenue interchange bridge and the existing pedestrian/bicycle overcrossing. As shown in **Figure 2-1G**, the gantry structure would be seen at the leading edge of where unobstructed views of the San Francisco Bay begin for westbound motorists between University Avenue and Ashby Avenue. Gantry 4 would largely avoid interfering with these views of the bay.

Although Gantry 4 would be a new visual element in viewpoint/view area 18, and would introduce a new source of light, it would not result in a change to the visual quality of the area. It includes the removal of the existing sign from the median, which would improve views of the San Francisco Bay and remove an existing light source. As a result, Gantry 4 would not result in an adverse effect to the visual quality of the study area.

Gantry 2

As shown in **Figure 2-1H**, Gantry 2 would be placed just north of the Ashby Avenue interchange bridge in viewpoint/view area 19. Gantry 2 would be placed in close proximity to the Ashby Avenue interchange such that it would not interfere with westbound motorists' unobstructed views of San Francisco Bay. There are several other sources of light already located in this area including overhead lighting and lighted signs. As a result, Gantry 2 would only obstruct views of the interchange bridge and would not result in a substantially new source of light during night time hours.

Eastbound motorists would not easily see Gantry 2 since it would be behind the Ashby Avenue interchange bridge. While Gantry 2 would result in a slight change to the visual intactness of viewpoint/view area 19, the effect would be less than significant since views of San Francisco Bay would not change.

Information Display Board 1 (eastbound)

As shown in **Figure 2-1I**, Information Display Board 1 would be placed near the existing Powell Street undercrossing. In viewpoint/view area 20, Information Display Board 1 would not obstruct views of the San Francisco Bay for motorists traveling in either direction along I-80. It would also not result in substantial new sources of light as there are many other existing light sources (overheard lights, lighted signs and lighted buildings) in this area. As shown in **Figure 2-1I**, Information Display Board 1 would be far enough from the planned pedestrian and bicycle crossing near Ashby Avenue to avoid interfering with views of or from this overpass. Information Display Board 1 would not result in an adverse effect to the visual quality of the area.

Gantry 1

As shown in **Figure 2-1I**, Gantry 1 would be located just north of the existing Powell Street undercrossing. Gantry 1would be highly visible to both westbound and eastbound I-80 motorists, but would not interfere with views of the San Francisco Bay. It would also not result in substantial new sources of light as there are many other existing light sources (overheard lights, lighted signs and lighted buildings) in this area. The location of Gantry 1would be far enough from the planned Ashby Avenue pedestrian and bicycle crossing to avoid interfering with views of or from this new overpass. Gantry 1 would not result in an adverse effect to the visual quality of the study area.

Temporary Construction Impacts

Temporary visual effects from the construction of the Build Alternative would be typical of any major freeway improvement project, and are not considered to be significant.

Consistency with Local Policies and Guidelines

The aesthetic policies and guidelines discussed above generally refer to the preservation of existing views of the San Francisco Bay and East Bay Hills. The Build Alternative would not result in visual impacts to these scenic views. The Build Alternative would be consistent with the aesthetic policies and guidelines of the local planning agencies.

No-Build Alternative

The No-Build Alternative would include some planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza, as described in Chapter 1. The No-Build Alternative would avoid installation of system management strategies along the I-80 corridor proposed under the Build Alternative. However the installation of these strategies would not result in substantial visual change. As such visual and aesthetic effects of the No-Build Alternative would not be substantially different than the Build Alternative.

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

The project would not result in any significant adverse effects to visual character, quality or important views of San Francisco Bay; therefore, no avoidance, minimization, or mitigation measures are necessary.

Viewpoint/View Area 2, Existing Viewshed (Westbound)

Viewpoint/View Area 2, with Proposed Project Components (Westbound)

Figure 2-1A
Sheet 1 of 9

Viewpoint/View Area 2 - Willow Avenue Interchange
Information Display Board Westbound 3

NOT TO SCALE

Interstate 80 Integrated Corridor Mobility Project

Visual Simulations of the Project Corridor

Viewpoint/View Area 12, Existing Viewshed (Westbound)

Viewpoint/View Area 12, with Proposed Project Components (Westbound)

Figure 2-1B
Sheet 2 of 9

Viewpoint/View Area 12 - Cutting Boulevard Interchange
Sign Bridge Structure (Gantry) Westbound 11

NOT TO SCALE

Interstate 80 Integrated Corridor Mobility Project

Visual Simulations of the Project Corridor

Viewpoint/View Area 14, Existing Viewshed (Westbound)

Viewpoint/View Area 14, with Proposed Project Components (Westbound)

Figure 2-1C
Sheet 3 of 9

ViewpointView Area 14 - Central Avenue Interchange
Sign Bridge Structure (Gantry) Westbound 9

NOT TO SCALE

Interstate 80 Integrated Corridor Mobility Project

Visual Simulations of the Project Corridor

Viewpoint/View Area 15, Existing Viewshed (Westbound)

Viewpoint/View Area 15, with Proposed Project Components (Westbound)

Figure 2-1D
Sheet 4 of 9

Interstate 80 Integrated Corridor Mobility Project

Viewpoint 15 - I-80/I-580 Crossing
Sign Bridge Structure (Gantry) Westbound 8
NOT TO SCALE

Visual Simulations of the Project Corridor

Viewpoint/View Area 16, Existing Viewshed (Westbound)

Viewpoint/View Area 16, with Proposed Project Components (Westbound)

Figure 2-1E
Sheet 5 of 9

Interstate 80 Integrated Corridor Mobility Project

Viewpoint 16 - North of Gillman Street Interchange
Sign Bridge Structure (Gantry) Westbound 6
NOT TO SCALE

Visual Simulations of the Project Corridor

Viewpoint/View Area 18, Existing Viewshed (Eastbound)

Viewpoint/View Area 18, with Proposed Project Components (Eastbound)

Figure 2-1F
Sheet 6 of 9

Interstate 80 Integrated Corridor Mobility Project

Viewpoint 18 - South of University Avenue Interchange
Sign Bridge Structure (Gantry) Westbound 4

NOT TO SCALE

Visual Simulations of the Project Corridor

Viewpoint/View Area 18, Existing Viewshed (Westbound)

Viewpoint/View Area 18, with Proposed Project Components (Westbound)

Figure 2-1G
Sheet 7 of 9

Interstate 80 Integrated Corridor Mobility Project

Viewpoint 18 - South of University Avenue Interchange
Sign Bridge Structure (Gantry) Westbound 4

NOT TO SCALE

Visual Simulations of the Project Corridor

Viewpoint/View Area 19, Existing Viewshed (Westbound)

Viewpoint View Area 19, with Proposed Project Components (Westbound)

Figure 2-1H
Sheet 8 of 9

Interstate 80 Integrated Corridor Mobility Project

Viewpoint 19 - Ashby Avenue Interchange
Sign Bridge Structure (Gantry) Westbound 2
NOT TO SCALE

Visual Simulations of the Project Corridor

Viewpoint/View Area 20, Existing Viewshed (Eastbound)

Viewpoint/View Area 20, with Proposed Project Components (Eastbound)

Figure 2-1I
Sheet 9 of 9

Interstate 80 Integrated Corridor Mobility Project

Viewpoint 20 - Powell Street Interchange
Sign Bridge Structure (Gantry) Westbound 1
NOT TO SCALE

Visual Simulations of the Project Corridor

2.2.4 Cultural Resources

2.2.4.1 Regulatory Setting

"Cultural resources" as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966, as amended, (NHPA) sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and the Department went into effect for the Department projects, both state and local, with FHWA involvement. The PA implements the Advisory Council's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Pilot Program (23 CFR 773) (July 1, 2007).

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the "use" of land from historic properties.

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

2.2.4.2 Affected Environment

This section is based on an Archaeological Survey Report approved in November 2010 (Department, 2010d) and a draft Historic Property Survey Report. The Archaeological Survey Report included an archaeological survey of the Area of Potential Effects (APE) and an archaeological site records and literature review. The APE encompasses the Department ROW from south of the Carquinez Bridge to south of Powell Street, the four areas of project improvements outside the Department ROW (see Chapter 1), and mapped cultural sites abutting the Department ROW (i.e., CA-CCO-303 and CA-CCO-547). The entire APE lies in areas previously disturbed by the construction of I-80 and arterial streets.

Historical Resources

A records search for the project APE identified 65 cultural resources within the 2,000-foot record search radius. Of the identified cultural resource sites, none of the historic resource sites were recorded as being within the APE. The Historic Property Survey Report determined a CEQA finding of no impact to historic properties and a Section 106 determination of no historic properties affected.

Archaeological Resources

Of the archaeological sites surveyed, two were identified as being within or adjacent to the APE. One of these sites consists of shellmounds. The other site is considered to be a shell midden[14] site. Shellmounds in the APE and in the surrounding area were originally recorded near the turn of the century; the most notable site is known as the Emeryville Shellmound located outside of the APE. The shellmounds were constructed of discarded shellfish remains and earth, and were often used as living surfaces, some of which contained human remains. According to the Archeological Survey Report, the archaeological resources surveyed within the APE appear to have been destroyed where they may have once been present. Intact portions may exist outside of the APE or below current development.

Additionally, a Buried Archaeological Site Assessment and Archaeological Work Plan (Department, 2010e) were completed in November 2010 to identify potential undocumented resources within the vertical APE of the project. This assessment determined that portions of the Build Alternative's footprint would be located in areas having a high or very high potential for buried prehistoric archaeology sites, primarily along the San Francisco Bay margin and/or near creek channels. Specifically, this assessment recommended subsurface explorations at 10 sensitive areas where deep vertical construction activities would occur.

Following the site assessment, a subsurface investigation was completed, including the collection and laboratory testing of core samples collected at the 10 sensitive areas identified above. The preliminary results of this investigation indicate that no intact or substantial prehistoric archaeological deposits are present where the Build Alternative would be located.

2.2.4.3 Environmental Consequences

Build Alternative

The Build Alternative would include minor ground disturbance activities within the existing Department ROW. All proposed ground disturbance activities would occur within areas that have previously been disturbed. Based on the amount of proposed ground disturbance of the Build Alternative and the previously disturbed nature of the APE, the Build Alternative is not expected to have an adverse impact on undocumented resources located within the APE.

The Build Alternative would not result in the use (direct or indirect) of a historic property qualifying for protection under Section 4(f).

No-Build Alternative

The No-Build Alternative would include some planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same general location as the project, it is likely that the No-Build Alternative would result in similar impacts related to cultural resources when compared to the Build Alternative. Archaeological surveys and literature reviews for these other planned and funded projects would be required under separate environmental review.

[14]Any kind of feature containing waste products relating to day-to-day human life.

2.2.4.4 Avoidance, Minimization, and/or Mitigation Measures

Construction of the Build Alternative is not expected to result in any adverse effects to known cultural resources; therefore, no avoidance, minimization, and/or mitigation measures are required. If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be halted until a qualified archaeologist can assess the nature and significance of the find.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovers the remains would contact the District 4 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code (PRC) Section 5097.98 are to be followed as applicable.

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2.3 Physical Environment

2.3.1 Hydrology and Floodplain

2.3.1.1 Regulatory Setting

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

In order to comply, the following must be analyzed:

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

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

2.3.1.2 Affected Environment

The analysis in this section is based on the Drainage Report prepared in September 2010 (Department, 2010f). The Drainage Report incorporated information from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for the cities of Hercules, Berkeley, and Emeryville.

As described in Chapter 1, the Build Alternative would implement various system management strategies within the project corridor, including ramp meter signal installations, large gantries, stand-alone variable advisory speed signs, and information display boards. These sign and signal installations would be located within the I-80 freeway right-of-way on existing impervious surfaces and would not affect existing drainage systems or topography of the study area. These improvements are therefore not anticipated to have an adverse effect on the hydrology of the study area.

Three on-ramps within the project corridor would be widened to accommodate high occupancy vehicle (HOV) preferential lanes. Widening would occur at the State Route 4 on ramp (referred to as the John Muir Parkway on ramp), the University Avenue westbound loop ramp, and the Ashby Avenue westbound on-ramp. This analysis focuses on the potential drainage and floodplain impacts from the on-ramp widening locations.

John Muir Parkway

The John Muir Parkway on-ramp is located in the Refugio Creek watershed. Several branches of Refugio Creek cross underneath I-80 via man-made culverts, flowing northwest toward San Francisco Bay. The main reaches of Refugio Creek converge after crossing underneath I-80 and flow through the Hercules urbanized area within a natural open channel. The drainage system that conveys runoff from the John Muir Parkway on-ramp discharges directly to Refugio Creek on the west side of San Pablo Avenue.

As shown in **Figure 2-2** (Sheet 1 of 3), the John Muir Parkway on-ramp is not located within the 100-year floodplain and lies within Zone X (unshaded).[1] Zone X (unshaded) is defined by FEMA as, "the areas of minimal flood hazard, which are the areas outside the Special Flood Hazard Area (SFHA) and higher than the elevation of the 0.2-percent-annual-chance (500-year) flood."

University Avenue

The University Avenue westbound loop ramp is located at the downstream end of the Strawberry Creek watershed. The drainage system in this area discharges runoff into a manmade culvert that carries Strawberry Creek to San Francisco Bay, approximately 500 feet downstream of this on-ramp.

As shown in **Figure 2-2** (Sheet 2 of 3), the University Avenue on-ramp is not located within the 100-year floodplain and also lies with Zone X (unshaded).[2]

Ashby Avenue

The Ashby Avenue on-ramp is located within Potter/Derby Creeks watershed of northwestern Alameda County. In this area, storm drain inlets convey runoff into manmade culverts and storm drains underneath I-80 directly to San Francisco Bay.

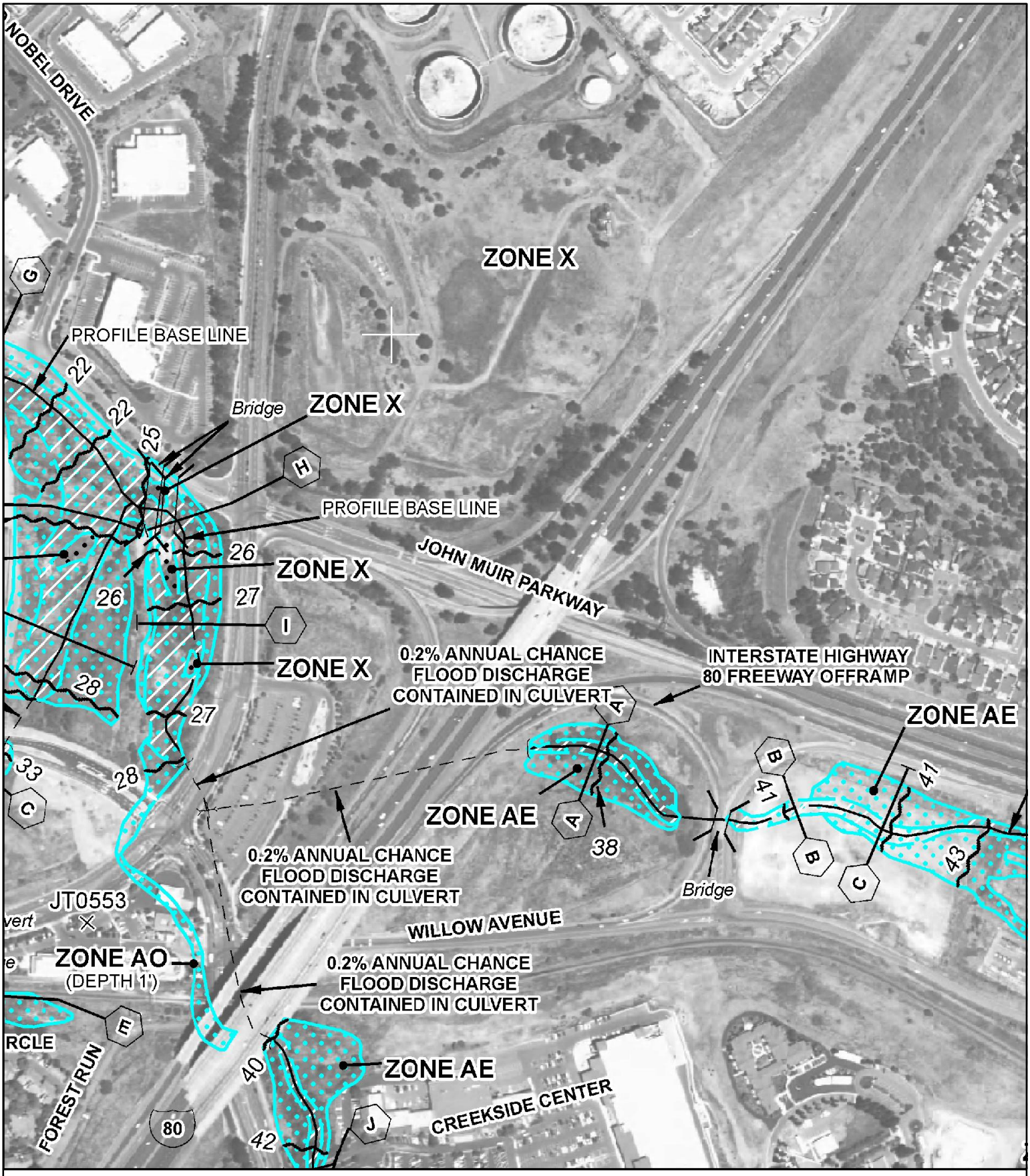
As shown in **Figure 2-2** (Sheet 3 of 3), the Ashby Avenue on-ramp is not located within the 100-year floodplain and also lies within Zone X (unshaded).[3]

Inundation Potential

A tsunami (pronounced soo-nah-mee) is a series of waves generated in a body of water by a rapid disturbance that vertically displaces the water. These changes can be caused by an underwater fault rupture (that generates an earthquake) or underwater landslides (typically triggered by earthquakes). Because of its proximity to the San Francisco Bay and San Pablo Bay, the project corridor is located within a tsunami inundation area.

Inundation from catastrophic structural dam failure can be caused by earthquake or rain overflow. Within the project corridor, dam failure inundation could affect those areas downhill, or west, of the Berryman Reservoir, located in Berkeley.

[1] FEMA FIRM Map Number 06013C0044F
[2] FEMA FIRM Map Number 06001C0056G.
[3] FEMA FIRM Number 06001C0056G



100-YEAR FLOOD PLAIN

FLOODWAY AREAS WITHIN 100-YEAR FLOOD PLAIN

500-YEAR FLOOD PLAIN

NOT TO SCALE

SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM, MAP NUMBER 06013C0044F

Figure 2-2
Sheet 1 of 3

Interstate 80 Integrated Corridor Mobility Project

FEMA Floodplain Maps (I-80/SR-4)

NOT TO SCALE

100-YEAR FLOOD PLAIN

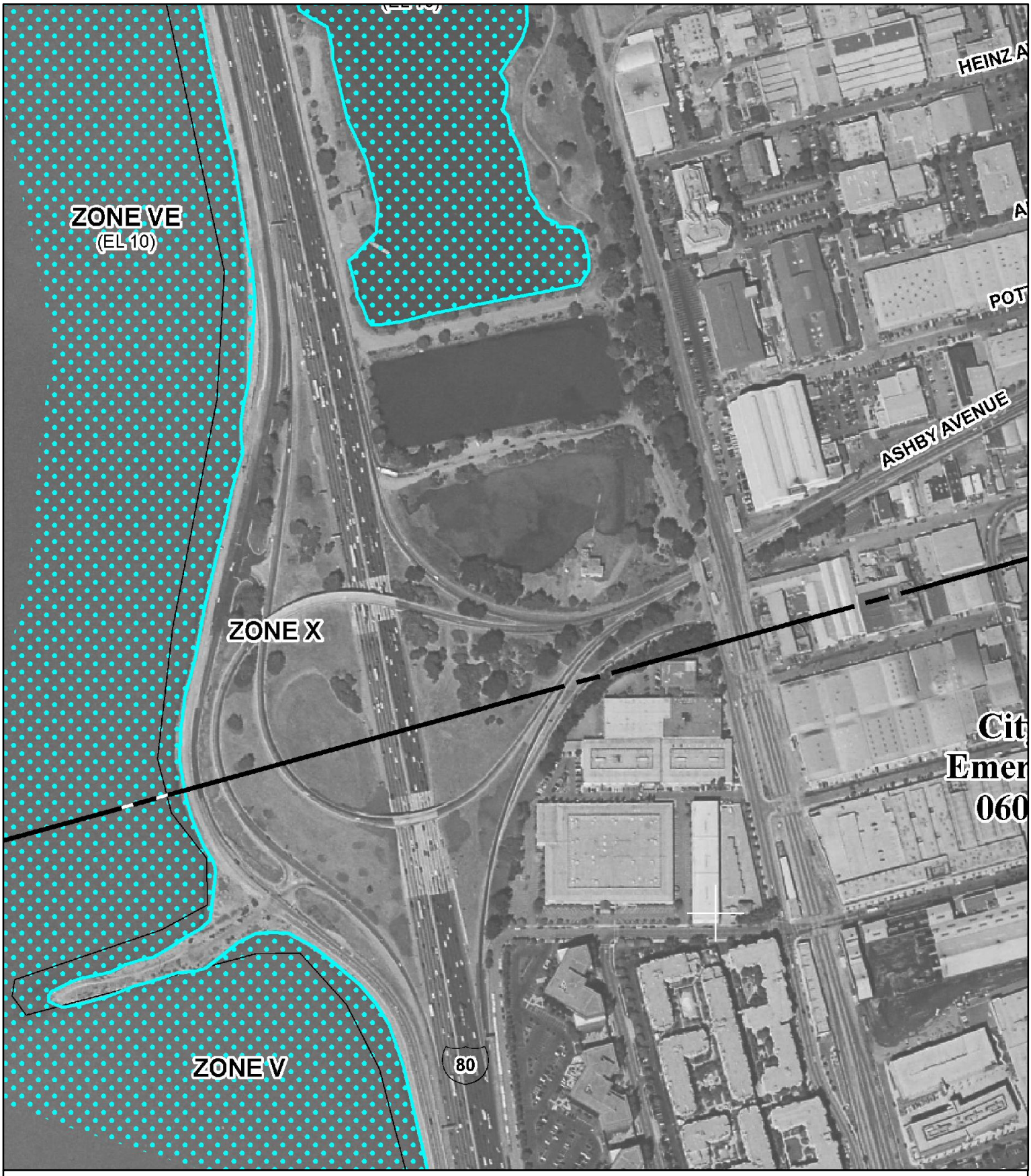
500-YEAR FLOOD PLAIN

Figure 2-2
Sheet 2 of 3

Interstate 80 Integrated Corridor Mobility Project

SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM, MAP NUMBER 060011C0056G

FEMA Floodplain Maps (I-80/University Avenue)



NOT TO SCALE

100-YEAR FLOOD PLAIN

500-YEAR FLOOD PLAIN

Figure 2-2
Sheet 3 of 3

Interstate 80 Integrated Corridor Mobility Project

SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY
NATIONAL FLOOD INSURANCE PROGRAM, MAP NUMBER 06001C0056G

FEMA Floodplain Maps (I-80/Ashby Avenue)

2.3.1.3 Environmental Consequences

Build Alternative

As stated above, installation of the ramp meter signals and traffic operation signs proposed under the Build Alternative would not affect the existing hydrology of the study area.

The on-ramp widening that would occur at the John Muir Parkway on-ramp, the University Avenue westbound loop ramp, and the Ashby Avenue westbound on-ramp would result in an increase of approximately 0.75-acres of paved impervious surfaces that would create an increase in storm water runoff into the existing drainage systems. However, according to the Drainage Report, this increase in storm water runoff would not exceed hydraulic capacity of the existing systems (see Section 2.3.2 for further discussion).

Floodplain Encroachment and Risk of the Action

All three on-ramp widening improvement areas lie outside the base 100-year floodplain. In addition, the Build Alternative would not have an indirect effect on the 100-year floodplains associated with the waterways that cross the I-80 corridor within the study area since the Build Alternative would not result in a substantial amount of new runoff that would affect the size or location of the nearby 100-year floodplain. There would be no adverse effects to emergency vehicle access, or to natural or beneficial floodplain values since the project would not affect the size or location of the 100-year floodplain associated with waterways that cross the I-80 corridor. Any existing flooding issues along the I-80 corridor that could impair emergency vehicle access would not be impacted by the Build Alternative. Since the project is not located within the 100-year floodplain, it would not have any effect on the beneficial values of the existing 100-year floodplain. There would be no significant floodplain risk.

Inundation Potential

The project would not add capacity to the freeway main line, on-ramps, or parallel arterials nor would it stimulate new development or alter ongoing development patterns along the I-80 corridor. Although the project corridor is located in an area with the potential for inundation from tsunamis and dam failure, the project would not expose people or structures to a increased risks of loss, injury, or death involving flooding.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). Although these projects would occur in the same I-80 corridor study area as the Build Alternative, a review of the FEMA Flood Insurance Rate Maps would be required under separate environmental review to determine if any of those projects are located within the 100-year floodplain.

2.3.1.4 Avoidance Minimization, and/or Mitigation Measures

The project is not expected to have an adverse effect on hydrology or floodplains and as such no avoidance, minimization, or mitigation has been incorporated into the project.

Even though the project would not result in any direct or indirect effect to the 100-year floodplains in the project vicinity, standard Best Management Practices (BMPs) as discussed in Section 2.3.2 below, would be implemented during construction to further minimize any potential indirect effect.

2.3.2 Water Quality and Storm Water Runoff

2.3.2.1 Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The Federal Water Pollution Control Act was subsequently amended in 1977, and was renamed the Clean Water Act (CWA). The CWA, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 CWA amendment established a framework for regulating municipal and industrial storm water discharges under the NDPES program. Important CWA sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) establishes addresses storm water and non-storm water discharges.
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (ACOE).

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the

applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are state listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the CWA requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

NPDES Program

The SWRCB adopted the Department's Statewide NPDES Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities, and activities in the State. NPDES permits establish a 5-year permitting time frame. NPDES permit requirements remain active until a new permit has been adopted.

In compliance with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of Best Management Practices (BMPs). The project would be programmed to follow the guidelines and procedures outlined in the 2003 SWMP to address storm water runoff or any subsequent SWMP version draft and approved.

Municipal Separate Storm Sewer System Program

The U.S. EPA defines a Municipal Separate Storm Sewer System (MS4) as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, country, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water. As part of the NPDES program, U.S. EPA initiated a program requiring that entities having MS4s apply to their local RWQCBs for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.

Construction Activity Permitting

Section H.2, Construction Program Management of the Department's NPDES permit states: "The Construction Management Program shall be in compliance with requirement of the NPDES General Permit for Construction Activities (Construction General Permit)". Construction General Permit (Order No. 2009-009-DWQ, adopted on September 2, 2009, became effective on July 1, 2010. The permit will regulate storm water discharges from construction sites that result in a DSA of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

The newly adopted permit separates projects into Risk Levels 1 – 3. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring. Risk levels are determined during the design phase and are based on potential erosion and transport to receiving waters. Applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP).

Caltrans Statewide NPDES Permit requires the Department to submit a Notice of Construction (NOC) to the RWCB to obtain coverage under the Construction General Permit. Upon project completion, a Notice of Completion of Construction (NOCC) is required to suspend coverage. This process will continue to apply to Department projects until a new Department Statewide NPDES Permit is adopted by the SWRCB. An NOC or equivalent form will be submitted to the RWQCB at least 30 days prior to construction if the associated DSA is 1 acre or more. In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is used for projects with DSA less than 1-acre.

During the construction phase, compliance with the permit and the Department's Standard Special Conditions requires appropriate selection and deployment of both structural and non-structural BMPs. These BMPs must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology (BAT/BCT) to reduce or eliminate storm water pollution.

2.3.2.2 Affected Environment

The analysis in this section is based on the following technical reports: the Drainage Report prepared in September 2010 (Department, 2010f). As described in the previous section, the implementation of various system management strategies within the project corridor, including ramp meter signal installations, large gantries, stand-alone variable advisory speed signs and information display boards under the Build Alternative would not affect the existing hydrology of the study area. As such, no adverse effects to water quality are anticipated from the operation of these components of the Build Alternative.

The on-ramp widening that would occur at the John Muir Parkway on-ramp, University Avenue westbound loop ramp, and the Ashby Avenue westbound on-ramp would result in an increase of approximately 0.75-acres in paved impervious surfaces that would slightly increase storm water runoff into the existing drainage systems which in turn could affect water quality. As such, this analysis focuses on the on the potential effects from the three ramp-widening improvement areas.

All of the ramp-widening improvement areas are located within the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (SFBWQCB), Region 2.

The ramp-widening improvement areas are located in watersheds that drain into San Francisco Bay or San Pablo Bay. Both the San Francisco Bay and San Pablo Bay are listed as CWA Section 303(d) Water Quality Limited Segments. The CWA identifies the water bodies as impaired by mercury, polychlorinated biphenyls, selenium, dioxins, diazinon, dieldrin, dichlorodiphenyltrichloroethane, chlordane, and furan compounds.

John Muir Parkway

The John Muir Parkway on-ramp is located within the Refugio Creek watershed, which encompasses approximately 3,116 acres and drains from the foothills southeast of the City of Hercules to the San Pablo Bay. Land uses within the upper reaches of this watershed consist mainly of ranch and regional park land. The Refugio Creek watershed is generally isolated from the urban development within the city of Hercules.

University Avenue

The University Avenue westbound loop ramp is located within the Strawberry Creek watershed, which encompasses approximately 1,163 acres and drains from the foothills of north Berkeley to San Francisco Bay. Land uses within upper reaches of this watershed consist mostly of private and regional preserve open space. The watershed is generally isolated from the urban development within the city of Berkeley.

Ashby Avenue

The Ashby Avenue westbound on-ramp is located within the Potter/Derby Creeks watershed. This watershed drains from northwestern Alameda County to San Francisco Bay. Potter Creek and Derby Creek have been completely filled-in and replaced with a storm drainage network, which receives large amounts of urban runoff from the cities of Berkeley and Emeryville.

2.3.2.3 Environmental Consequences

Build Alternative

As stated above, the implementation of system management strategies within the project corridor, including ramp meter signal installations, large gantries, stand-alone variable advisory speed signs and information display boards proposed under the Build Alternative would not affect the water quality of the project corridor.

The ramp-widening improvements proposed under the Build Alternative would result in a combined 0.75-acre of new impervious paved surfaces. According to Section 4 of the Department's Storm Water Quality Handbook, permanent treatment BMPs are only required if a project results in a net increase of more than 1 acre of impervious surface. Since the increase in impervious area for ramp-widening improvements is less than 1 acre (at each individual ramp location), permanent BMPs are not required because the anticipated adverse affect would be negligible.

John Muir Parkway

The total increase in impervious area due to modifications of the John Muir Parkway on-ramp is 0.22 acres. Ramp-widening at this location would require the relocation of four existing inlets and one new concrete v-ditch. The existing drainage systems serving the northern and southern portions of the on-ramp area have excess capacity to convey peak flows to the storm drain system. According to the Drainage Report, the additional 0.22-acres of impervious surface area created by the ramp-widening would increase peak flows to several existing inlets from 0.2 to 4.4 cubic feet per second. However, the relocation of the inlets and the increase in peak flows would not significantly affect water quality and the hydraulic capacity of the existing downstream drainage system, which has substantial excess capacity to convey peak runoff from this area.

University Avenue

The total increase in impervious area due to modifications of the University Avenue westbound loop ramp is 0.06-acres. Ramp-widening at this location would require the installation of an additional inlet with a connecting 12-inch pipe. The existing drainage system has significant excess capacity to convey peak flows to the existing culvert. According to the Drainage Report, the additional 0.06 acres of impervious surface area would increase peak flows to two existing inlets by 0.1 cubic feet per second. This minor modification to the existing storm drain system and the increase in peak flows would not significantly affect water quality and the hydraulic capacity of the system, which has substantial excess capacity to convey peak runoff from this area.

Ashby Avenue

The total increase in impervious area due to modifications of the Ashby Avenue westbound on-ramp is 0.46 acres. Ramp-widening at this location may require the relocation of two existing inlets. The drainage system serving the northern portion of the on-ramp has significant excess capacity to convey peak flows while the drainage system of the central portion of the on-ramp is at or near capacity to convey peak flows. There is significant excess capacity of the drainage system at the southern portion of the on-ramp area. According to the Drainage Report, the additional 0.46 acres of impervious surface area would increase peak flows to several existing inlets from 0.3 to 0.5 cubic feet per second. The Drainage Report determined that the relocation of these inlets and the increase in peak flows would not affect water quality and the hydraulic capacity of the existing downstream drainage system.

Temporary Construction Impacts

Earth-moving and other construction activities could cause minor erosion and runoff of topsoils into the drainage systems along the project corridor during construction which could temporarily affect water quality in local waterways.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). These planned and funded projects would be located within the same area as the Build Alternative; however, technical analyses would be required under separate environmental review to determine if these projects would have any impacts to water quality or storm water runoff along the I-80 corridor.

2.3.2.4 Avoidance Minimization, and/or Mitigation Measures

Construction activities would adhere to the Department's Statewide NPDES permit which regulates storm water discharges from activities on its freeways and highways. Additionally, the project engineer or construction contractor would be required to prepare and implement a Storm Water Pollution Prevention Plan in compliance with the Basin Plan prepared by the RWQCB and the General Construction Permit. Incorporation of these BMPs and any measures outlined in the Storm Water Pollution Prevention Plan would ensure that the Build Alternative would not adversely affect water quality in local waterways or groundwater quality. Protective measures would include, at a minimum:

- No discharge of pollutants from vehicle and equipment cleaning will be allowed into any storm drains or water courses.
- Vehicle and equipment fueling and maintenance operations will be at least 50 feet away from water courses, except at established commercial gas stations or established vehicle maintenance facility.
- Concrete wastes will be collected in washouts and water from curing operations will be collected and disposed of and not allowed into water courses.
- Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require.
- Protection of graded areas from erosion using a combination of silt fences, fiber rolls along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas.
- Spill containment kits will be maintained on site at all times during construction operations and/or staging or fueling of equipment.

2.3.3 Geology/Soils/Seismic/Topography

2.3.3.1 Regulatory Setting

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

This section also discusses geology, soils, and seismic concerns as they relate to public safety and proposed project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department's Office of Earthquake Engineering is responsible for assessing the seismic hazard for

Department projects. The current policy is to use the anticipated Maximum Credible Earthquake (MCE), from young faults in and near California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

2.3.3.2 Affected Environment

The analysis in this section is based on the Preliminary Geotechnical Report completed in September 2010 (Department, 2010i).

Site Geology and Subsurface Conditions

The study area consists of gently sloping lowlands with relatively young sediments derived from erosion of the adjacent hills of the Coastal Range. No natural landmarks or other examples of a major geologic feature (such as a scenic rock outcropping) occur in the study area.

Subsoils in the study area consist of alluvial soil (of varying thicknesses) overlying bedrock. The Franciscan Complex is the underlying "basement" bedrock in the project region. The main rock types of the Franciscan Complex are predominately marine sedimentary rocks such as sandstone and shale with lesser amounts of marine basaltic rocks and chert as well as serpentinite, a hydro-thermally altered ultramafic (low silica, high iron and magnesium) oceanic crust. From south to north, the project corridor is underlain by the following sediment deposits:

- Artificial fill over estuarine mud (United States Geological Survey (USGS)[4] code: "afem")
- Artificial fill ("af")
- Holocene alluvial fan deposits ("Qhf")
- Pleistocene alluvial fan deposits ("Qpf")
- Holocene to Pleistocene alluvial fan deposits ("Qf")
- Pre-Quaternary deposits ("br")

Groundwater

The groundwater elevation varies greatly along the project corridor. In general, groundwater levels were encountered at a depth of approximately 5 to 12 feet below grade; the depths vary over time due to seasonal groundwater fluctuation, surface and subsurface flows, ground surface run-off, water level in the creeks, and other factors.

Seismic Conditions

The study area is located in a seismically active area of California. Many faults in this area are capable of producing earthquakes that may cause strong ground shaking. **Table 2.3-1** presents the maximum earthquake magnitudes of faults in the vicinity of the I-80 corridor.

[4] Witter, et al, 2006. USGS Open-File Report 2006-1037

Table 2.3-1: Maximum Earthquake Magnitudes for Faults in the Vicinity of the I-80 Corridor

Fault	Closest Distance from I-80 (mi)	Maximum Magnitude Earthquake
Southampton fault	5.6	6.3
Hayward fault zone (Northern section)	0	7.3
San Andreas fault zone (North Coast section)	16.6	7.9
San Andreas fault zone (Peninsula section)	15.6	7.9

Liquefaction Susceptibility

The area between Powell Street and Central Avenue consists of artificial fill over estuarine mud. The fill materials were imported, and consist of disturbed mud, sand, and gravel. In general, sediment deposits in the study area have already settled due to compression of the mud under the weight of the artificial fill. Sediment deposits between Powell Street and Central Avenue are classified by the USGS and the California Geological Survey as having a very high susceptibility to liquefaction.[5]

2.3.3.3 Environmental Consequences

Build Alternative

Proposed improvements would occur within the paved right-of-way and landscaped areas of the I-80 corridor, and would not require substantial earthmoving activities. In addition, soil erosion would be minimal because very little vegetation would be removed during installation of the proposed improvements.

The project is located in a seismically active region. Without proper seismic engineering, improvements located adjacent to or spanning I-80 could collapse onto the freeway, on-ramps, or other structures or facilities as a result of strong ground shaking or liquefaction.

Temporary Construction Impacts

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

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 freeway between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1), The traveling public and construction workers under the No-Build Alternative would be subject to the same potential risks associated with seismic activity under the Build Alternative since the planned and funded projects would occur in the same seismically active area. Projects under the No-Build Alternative would also be required to comply with the Department's standard design and construction guidelines and OSHA requirements.

[5] Liquefaction is an unstable ground condition in which water-saturated soils change from a solid to semi-liquid state because of a sudden shock or strain.

2.3.3.4 Avoidance Minimization, and/or Mitigation Measures

Under the Build Alternative, any new structures would be constructed in compliance with the Department's standard design and construction guidelines. No avoidance, minimization, or mitigation measures would be required beyond the implementation of the Department's standard design and construction guidelines. Site specific subsurface soil conditions and groundwater conditions within the project corridor should be verified during the Plans, Specifications, and Estimates phase.

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

As described above in Section 2.3.2.4, erosion control measures would be implemented during construction activities in accordance with the best management practices outlined in the SWPPP. Protective measures would reduce soil erosion and minimize impacts to water quality.

2.3.4 Paleontology

2.3.4.1 Regulatory Setting

Paleontology is the study of life in past geologic time based on fossil plants and animals. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized or funded projects. (e.g., Antiquities Act of 1906 [16 USC 431-433], Federal-Aid Highway Act of 1956 [23 USC 305]). Under California law, paleontological resources are protected by the California Environmental Quality Act.

2.3.4.2 Affected Environment

This section is based on the Paleontological Identification Report approved in January of 2011(Department, 2011b). The paleontological study area includes the I-80 corridor plus a ¼-mile buffer on either side of the freeway.

The study area is located within the Coastal Range, which is the topographic landform between the Pacific Ocean to the west and the Great Valley of Central California to the east. Geological units within the vicinity of the study area are described above in Section 2.3.3.2. The study area contains several geologic formations that have a high paleontological sensitivity, including the Pleistocene alluvial fan deposits, Holocene to Pleistocene alluvial fan deposits, and Pre-Quaternary deposits (of the Tertiary Period).

2.3.4.3 Environmental Consequences

Build Alternative

Construction activities could impact unknown paleontological resources in highly sensitive geologic units. Installation of gantries and on-ramp widening improvements would require earthmoving activities that would result in ground disturbance. Impacts to fossils may occur by destroying them or otherwise altering them in such a way that their scientific value is lost.

Installation of the project components would require excavation to a depth of up to 33 feet, as listed below:

- Active traffic management gantries: up to 33 feet
- Information display boards: up to 22 feet
- Variable advisory speed signs: 5 feet
- Closed-circuit television cameras: 5 feet

According to the Paleontological Identification Report, less than 18 percent of the total disturbance from deep excavations would occur within paleontological sensitive formations. Five of the components requiring deep excavation would be constructed within these sensitive geologic units.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same paleontological study area as the Build Alternative, it is likely that the No-Build Alternative could result in similar impacts to unknown paleontological resources within the paleontological study area. A calculation of the potential area of disturbance by these projects would be determined under separate environmental review.

2.3.4.4 Avoidance Minimization, and/or Mitigation Measures

The following mitigation measure would reduce the likelihood of potential adverse effects to paleontological resources in the study area.

- **Mitigation Measure PAL-1:** Prior to the start of construction, a qualified paleontologist shall be retained to conduct a field survey of the project right-of-way to identify exposures of sensitive stratigraphic units that may be disturbed during project construction. A Paleontological Evaluation Report (PER) shall be prepared to define actual locations where monitoring will be necessary based upon the project design. The PER shall be prepared in accordance with the Department's Standard Environmental Reference (SER).

  For any areas where surface expressions of sensitive stratigraphic units are identified, and for any areas where subsurface excavation is anticipated, the project paleontologist shall both design and implement a paleontological mitigation program (PMP) for the project. The PMP shall be designed by the project paleontologist consistent with Society of Vertebrate Paleontology guidelines (Society of Vertebrate Paleontology 1995, 1996) and with the Department's SER. The PMP shall include at a minimum:

- Preconstruction coordination;
- Construction monitoring;
- Data recovery;
- Fossil treatment;
- Curation procedures; and
- Reporting.

Measures contained in the PMP would reduce potential paleontological impacts to a less-than-significant level by allowing for the recovery of fossil remains and associated specimen data and corresponding geologic and geographic site data that otherwise would be lost.

2.3.5 Hazardous Waste/Materials

2.3.5.1 Regulatory Setting

Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for "cradle to grave" regulation of hazardous wastes. Other federal laws include:

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

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

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during proposed project construction.

2.3.5.2 Affected Environment

The analysis summarized in this section is based on the Hazardous Materials Technical Memorandum prepared in June 2010 (Department, 2010j). This analysis focuses on those areas that would have the most intensive ground disturbance under the Build Alternative; specifically, the ramp widening associated with the John Muir Parkway on-ramp, University Avenue westbound loop ramp, and the Ashby Avenue westbound on-ramp.

A hazardous materials regulatory database search was conducted for the three ramp widening improvement areas in order to identify nearby hazardous waste/material sites and/or unauthorized releases with the potential to impact the project. Sites were considered to warrant further consideration if they: (1) involved groundwater contamination; (2) were thought to be located hydrologically upgradient of the right-of-way with respect to anticipated groundwater flow; and/or (3) were located hydrologically upgradient with respect to surface water flow/stormwater runoff.

A site reconnaissance of the three ramp widening improvement areas was also conducted in order to further identify nearby sites or land uses that might contain hazardous materials that could adversely affect the project.

The following potential concerns with respect to hazardous materials and hazardous waste were identified:

Identified hazardous waste/materials sites

John Muir Parkway

The regulatory database search identified two sites within a half mile of the John Muir Parkway on-ramp with recorded hazardous material releases and/or contamination. However, a field reconnaissance and further evaluation of database records for these sites did not indicate that there was a potential for the migration of hazardous materials to the on-ramp widening area. Accordingly, the identified sites are not expected to pose an environmental concern with respect to the on-ramp widening improvements at this location.

University Avenue

The regulatory database search identified two sites within a half mile of the University Avenue westbound loop that could pose an environmental concern to the project. Both sites were listed in the database as having soil and groundwater contamination. Due to the fact that these sites are located hydrologically upgradient and are within close proximity of the proposed ramp improvements, there is a potential that contaminated groundwater from these sites has impacted the area.

Ashby Avenue

The regulatory database search identified 15 sites within a half mile of the Ashby Avenue westbound on-ramp improvements that may pose an environmental concern. All these properties were reported to have soil and/or groundwater contamination. Due to the fact that these sites are located hydrologically upgradient and are within close proximity of the proposed ramp improvements, there is a potential that contaminated groundwater from these sites has impacted the area.

Aerially Deposited Lead

Until their use was banned in the 1990s, additives in gasoline expelled lead-based compounds from engine exhaust. Consequently, lead was aerially deposited as a particulate, frequently concentrating onto the adjacent road shoulders and in medians. Lead can be hazardous to humans as exposure can adversely affect the nervous, circulatory, and reproductive systems and can severely damage the brain and kidneys. The U.S. EPA has determined that lead is a probable human carcinogen.

Historical aerial photographs show that the I-80 corridor has supported vehicular traffic from the late 1950s. Due to this long-term vehicular activity, it is likely that the surface soils along these on-ramps contain aerially deposited lead.

Asbestos and Lead-Based Paint

Asbestos was commonly used in construction materials, such as insulation in buildings and piping, until the 1980s, when its use was phased out. Similarly, lead-based paints, such as the ones used to paint overpasses, were used up until 1978. The Department of Health and Human Services, the World Health Organization, and the U.S. EPA have determined that asbestos is a human carcinogen. Retaining walls, overpasses, and bridge structures in the vicinity of the project were constructed prior to the 1980s, and may contain asbestos, particularly in older concrete and lead-based paint.

2.3.5.3 Environmental Consequences

Build Alternative

Several sites near the University Avenue westbound loop ramp and the Ashby Avenue westbound on-ramp improvement areas are known to have active cases for the unauthorized release of various hazardous materials. Due to the close proximity of these sites, and the fact that they are located hydrologically upgradient, construction activities such as grading and excavation could encounter contamination from these sites. Construction workers may also be exposed to aerially deposited lead in surface soils, which could result in significant health hazards.

The project would not involve demolition of existing bridge structures or other freeway elements that potentially contain asbestos or lead-based paint. Accordingly, no adverse effects related to asbestos or lead-based paint would occur.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same study area as the Build Alternative, it is likely that the No-Build Alternative would result in similar impacts related to aerially deposited lead and soil/groundwater contamination from nearby sites of concern. A separate assessment of hazardous materials and hazardous waste risks would be required for these projects under separate environmental review.

2.3.5.4 Avoidance Minimization, and/or Mitigation Measures

In accordance with the Department's Standard Special Provision 07-330, the contractor would be notified that increased concentrations of aerially deposited lead may be present in the ramp widening improvement areas, and would be required to prepare a Lead Compliance Plan to prevent or minimize worker exposure. Proper waste characterization and disposal of lead-containing materials would be conducted in accordance with Title 22 of the California Code of Regulations and Section 25157.8 of the California Health and Safety Code.

A preliminary site investigation would be prepared during the Plans, Specifications and Estimates Phase at the University Avenue westbound loop ramp and the Ashby Avenue westbound on-ramp improvement areas to identify and delineate any hazardous substances that may be present. In accordance with Department protocol, a Site Safety Plan would be prepared and implemented prior to initiation of any construction/development activities to reduce potential health and safety hazards to workers and the public.

2.3.6 Air Quality

2.3.6.1 Regulatory Setting

The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), lead (Pb), and sulfur dioxide (SO_2).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as Metropolitan Transportation Commission (MTC) for Alameda and Contra Costa counties and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires "hot spot" analysis if an area is "nonattainment" or "maintenance" for carbon monoxide (CO) and/or particulate matter. A region is a "nonattainment" area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called "maintenance" areas. "Hot spot" analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in "nonattainment" areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the proposed project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

2.3.6.2 Affected Environment

The analysis for this section was based on the Air Quality Technical Report completed in August 2010 (Department, 2010k).

The project corridor is located within the San Francisco Bay Area Air Basin (SF Air Basin) and within the jurisdictional boundaries of the Bay Area Air Quality Management District (BAAQMD).

Meteorological conditions such as wind speed, the altitude at which pollutants are mixing and dispersing, and atmospheric conditions affect the region's air quality. Temporary, short-term variations (like seasonal or daily conditions) result from frequent changes in these factors. For example, meteorological factors of the SF Air Basin, such as clear skies and relatively warm temperatures (common during the summer months) mix with localized and/or transported pollutant emissions and decrease air quality conditions. Variations in long-term air quality conditions are directly related to changes in the type and amount of air pollutant emissions in the region.

The project corridor is located in a climate subregion that stretches from the City of Richmond to the City of San Leandro with a western boundary of the San Francisco Bay and an eastern boundary of the Oakland-Berkeley hills. The prevailing winds for most of this subregion are from the west. Temperatures in this subregion have a narrow range due to the proximity of the moderating marine air. During the summer, temperatures range from the mid-70s down to the mid-50s and during the winter, temperatures range from the high 50s down to the low 40s.

2.3.6.3 Environmental Consequences

Build Alternative

Regional Air Quality Conformity

The BAAQMD monitors pollutants of concern, known as criteria pollutants, and air quality conditions throughout the SF Air Basin. The current attainment status for the SF Air Basin according to national and state standards of criteria pollutants is included in **Table 2.3-2**.

Table 2.3-2: San Francisco Bay Area Air Basin Attainment Status

Pollutant	California Standards	National Standards
Ozone (O_3)	Nonattainment	Nonattainment
Carbon monoxide (CO)	Attainment	Attainment
Nitrogen dioxide (NO_2)	Attainment	Attainment
Sulfur dioxide (SO_2)	Attainment	Attainment
Particulate matter (PM_{10})	Nonattainment	Unclassified
Fine particulate matter ($PM_{2.5}$)	Nonattainment	Attainment for annual, Nonattainment for 24 hour
Lead (Pb)	Attainment	Attainment

As shown in **Table 2.3-2**, the SF Air Basin is not in attainment of state or federal standards with respect to Ozone or $PM_{2.5}$. In addition, the SF Air Basin is not in attainment of state standards for PM_{10}.

As discussed in Chapter 1, the project is intended to improve traffic flow on I-80 and would not increase traffic volumes or increase capacity of the freeway. The proposed system management strategies would improve traffic flow and would not result in an increase in vehicle emissions in the I-80 corridor.

The I-80 ICM project is fully funded and included in the approved MTC *Transportation 2035* RTP and the FY 2010/2011 Transportation Improvement Program (TIP). In addition, the TIP identifies the project as being exempt from the requirement to determine regional air quality conformity, as it would provide "traffic control devices and operating assistance other than signalization." These types of improvements are among the list of exempt projects in Table 2 of 40 CFR 93.126. Although the project corridor is located in a non-attainment area for a number of criteria pollutants, the project is exempt from conformity with regional air quality standards in accordance with 40 CFR 93.126. Accordingly, no carbon monoxide or particulate matter hot spot analysis is required.

Mobile Source Air Toxics (MSAT)

In addition to the criteria pollutants, mobile source air toxics (MSAT) are regulated by the EPA in order to meet air quality attainment goals. MSAT are a subset of the 188 hazardous air pollutants identified by the Clean Air Act as harmful to human health. MSATs are emitted into the air as fuel evaporates or passes through engines unburned.

As discussed above, the project is exempt from the requirement to determine regional and project level air quality conformity in accordance with 40 CFR 93.126. Accordingly, the Build Alternative is considered to have no meaningful potential MSAT effects as defined in the *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents* published by the Federal Highway Administration (FHWA) on September 30, 2009.

Temporary Construction Impacts

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Sources of airborne or fugitive dust would include disturbed soils in the construction areas.

In addition to dust-related emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate carbon monoxide, sulfur dioxide, nitrogen oxides, volatile organic compounds, and some soot particulate matter from equipment exhaust emissions. Additional ozone could be formed through chemical reactions derived from nitrogen oxides and volatile organic compounds mixing with sunlight and heat. Emissions from associated construction vehicles or idling equipment could expose individuals in residences and businesses in the vicinity of the project corridor to pollutants in the exhaust.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these projects would also be located within the SF Air Basin, it is likely that the No-Build Alternative would result in similar construction-related air quality emissions as the proposed Build Alternative. Regional and project level air quality conformity for each planned and funded project would be required and would be determined under separate environmental review.

Global Climate Change

Climate change is analyzed in Section 2.6 under "Climate Change (CEQA)". Neither EPA nor FHWA has promulgated explicit guidance or methodology to conduct project-level greenhouse gas analysis. As stated on FHWA's climate change website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process would facilitate decision-making and improve efficiency at the program level, and would inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders regarding climate change, the issue is addressed in the CEQA chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts do correlate with efforts that the state has undertaken and is undertaking to deal with transportation and climate change. The four strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours travelled.

2.3.6.4 Avoidance Minimization, and/or Mitigation Measures

Most of the construction impacts to air quality are short-term in duration and would not result in adverse or long-term conditions. Implementation of the following measures would avoid or minimize any air quality impacts resulting from construction activities:

- The construction contractor shall comply with the Department's Standard Specifications Section 7-1.01F and Sections 10 and 18 of the Department's Standard Specifications (2006).

  a) Section 7, "Legal Relations and Responsibility," addresses the contractor's responsibility on many items of concern, such as: air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; and convenience of the public; and damage or injury to any person or property as a result of any construction operation. Section 7-1.01F specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
  b) Section 10 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.

- BAAQMD has identified the set of feasible PM_{10} control measures for construction activities shown below. When applicable, inclusion of these measures in construction contracts for the proposed project would reduce potential construction-related emissions to less than significant according to the BAAQMD. The Department shall ensure that the contractor requires that the control measures identified below be included in contracts awarded for the construction of the proposed project where applicable.

  a) All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
  b) All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
  c) All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day.
  d) Limit traffic speeds on unpaved roads to 15 miles per hour.
  e) All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be load as soon as possible after grading unless seeding or soil binders are used.
  f) Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes. Clear signage shall be provided for construction workers at all access points.
  g) All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
  h) Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

2.3.7 Noise

2.3.7.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the proposed project unless such measures are not feasible.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA involvement (and the Department, as assigned), the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2.3-3: Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D	–	Undeveloped lands.
E	52 Interior	Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Table 2.3-4 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with common activities.

Table 2.3-4: Noise Levels of Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock Band
Jet Fly-over at 300m (1000 ft)		
	100	
Gas Lawn Mower at 1 m (3 ft)		
	90	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)		Food Blender at 1 m (3 ft)
	80	Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime		
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		
		Library
Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

In accordance with the Department's *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, August 2006*, a noise impact occurs when the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Department's *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources and safety considerations. The reasonableness determination is based on a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents acceptance, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and local agencies input, newly constructed development versus development pre-dating 1978 and the cost per benefited residence.

2.3.7.2 Affected Environment

The following analysis is based on the Noise Technical Memorandum completed in July 2010 (Department, 2010l).

The existing noise environment throughout the project corridor varies by location, depending on site characteristics such as proximity to I-80, the relative local elevations and terrain, and any intervening structures or barriers. There is a mix of single-family and multi-family residential, commercial, industrial, and agricultural land uses throughout the project corridor. **Figure 2-3** depicts the location of noise sensitive areas within 500 feet of I-80. Category B land uses – in the form of single-family and multi-family residential land uses and open space such as parks and golf courses – border parts of the project corridor.

No noise sensitive land uses are located adjacent to three ramp-widening locations. Land uses in the vicinity of these three ramp areas are commercial, industrial, and/or undeveloped. No other projects with noise-sensitive areas have been planned, designed, and programmed adjacent to these ramp-widening locations. Therefore, there are no receivers that could potentially be exposed to traffic noise impacts from the project, and detailed traffic noise analysis is not required.

Title 23, Part 772 of the Code of Federal Regulations – Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR 772) defines a Type I project as a "proposed Federal or Federal-aid highway project for the construction of a highway on new location or the physical alteration of an existing highway which significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes." The FHWA has defined Type I projects as those that could "include the addition of an interchange, ramp, auxiliary lane, or truckclimbing lane to an existing highway, or the widening of an existing ramp by a full lane for its entire length. As such, the ramp widening improvement areas may be considered Type I. The FHWA noise regulations require noise analyses for all Type I projects.

2.3.7.3 Environmental Consequences

Build Alternative

As discussed in Chapter 1, the project is intended to improve traffic flow on I-80 and would not increase the capacity of the freeway. As such, existing noise levels along the project corridor would not be affected by the operation of the proposed intelligent transportation system equipment. The proposed ramp widening improvement areas are the only components of the Build Alternative that would have the potential to increase noise levels, and may be considered a Type I project under 23 CFR 772. However, there are no noise sensitive land uses in proximity to the three ramp-widening locations (John Muir Parkway on-ramp, the University Avenue westbound loop ramp, and the Ashby Avenue westbound on-ramp). No proposed projects with noise-sensitive land uses have been planned, designed, or programmed adjacent to the proposed ramp-widening locations of the project. Therefore, detailed traffic noise analysis is not required.

Temporary Construction Impacts

The level of noise generated by construction activities would be a function of the type of construction equipment used, duration of the construction phase, and distance between the noise source and receptor. **Table 2.3-5** lists the types of construction equipment that would be used to construct the improvements proposed under the Build Alternative. **Table 2.3-6** shows average construction equipment noise levels at 50 feet from the source. Hand tool noise and electrical work was assumed to be negligible in the presence of motorized equipment.

Table 2.3-7 includes the combined construction noise levels that would be generated from the construction/installation of the improvements proposed under the Build Alternative. Noise levels are presented at specified distances from the assumed source (i.e., the construction equipment). As shown in this table, noise from the construction equipment generally attenuates at a rate of 6 dBA per doubling of distance from the source.

Table 2.3-5: Types of Construction Equipment and Installation Requirements

Type of Construction/ Installation	Construction Equipment Needed	Daytime Construction (per each installation)	Nighttime Construction (per each installation)	Electrical Work (per each installation)
Adaptive Ramp Metering	Trencher Front-End Loader Concrete Mixing Truck Concrete Pump Water Truck Hand Tools	4 days	None	4 months
HOV Preferential Lanes (non-widening locations)	Striping Machine Stencils Hand Spray Equipment	None	2-3 nights	None
HOV Preferential Lanes (widening locations)	Striping Machine Stencils Hand Spray Equipment Asphalt Paver Roller Backhhoe Concrete Cutting Machine Front-End Loader Hydro-Seeding Machine	80 days	None	1 month
Standalone Variable Advisory Speed Sign Devices	Backhoe Lift Crane (40-Ton) Concrete Mixing Truck Concrete Pump Water Truck Hand Tools	2 days	None	4 months

Type of Construction/ Installation	Construction Equipment Needed	Daytime Construction (per each installation)	Nighttime Construction (per each installation)	Electrical Work (per each installation)
Active Traffic Management Gantries (including attached Lane Use Signal signs and Variable Advisory Speed Signs)	CIDH Drill Rig Crane (80-Ton) Concrete Mixing Truck Concrete Pump Backhoe Water Truck Hand Tools	None	6 nights	4 months
Closed-Circuit Television Cameras	CIDH Drill Rig Crane (40-Ton) Concrete Mixing Truck Backhoe Water Truck Hand Tools	5 days	None	4 months
Information Display Boards	CIDH Drill-Rig Backhoe Crane (40-Ton) Concrete Mixing Truck Concrete Pump, Water Truck Hand Tools	3 days	None	4 months

Table 2.3-6: Construction Equipment Noise Levels

Equipment	Average Noise Level at 50’	Equipment	Average Noise Level at 50’
Trencher	80 dBA	Concrete Cutter	78 dBA
Front-End Loader	79 dBA	Hydro-Seeder	75 dBA
Concrete Mixing Truck	85 dBA	Lift	75 dBA
Concrete Pump	85 dBA	Crane (40-Ton)	82 dBA
Water Truck	85 dBA	CIDH Drill Rig	78 dBA
Striping Machine	75 dBA	Crane (80-Ton)	85 dBA
Asphalt Paver	88 dBA	Sawcut Machine	78 dBA
Roller	73 dBA	Sealant Machine	73 dBA
Backhoe	80 dBA		

Table 2.3-7: Combined Construction Noise Levels

Type of Construction/ Installation	Combined Noise Level			
	50 feet	100 feet	200 feet	400 feet
Adaptive Ramp Metering	91 dBA	85 dBA	79 dBA	73 dBA
HOV Preferential Lanes (non-widening)	75 dBA	69 dBA	63 dBA	57 dBA
HOV Preferential Lanes (widening)	90 dBA	84 dBA	78 dBA	72 dBA
Variable Advisory Speed Signs	91 dBA	85 dBA	79 dBA	73 dBA
Gantries	92 dBA	86 dBA	80 dBA	74 dBA
Closed-Circuit Television Cameras	90 dBA	84 dBA	78 dBA	72 dBA
Information Display Boards	91 dBA	85 dBA	79 dBA	73 dBA

During the construction period, some of the noise sensitive locations that are close to I-80 may be exposed to high noise levels. Worst-case noise levels would be expected between the Carlson Boulevard/I-80 interchange and Portrero Avenue, where the installation of the proposed components of the Build Alternative would be approximately 50 feet from single-family residences. Periodic noise levels may be as high as 91 dBA Leq(h) in this area. Avoidance measures below include compliance with the Department's Standard Specifications that require contractors to comply with local regulations and ordinances on sound control and noise levels during construction.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located in the I-80 corridor near the same noise sensitive receptors, it is likely that the No-Build Alternative would result in the same temporary construction impacts that would be affected by the proposed Build Alternative. A noise analysis would be required for each project under separate environmental review.

2.3.7.4 Avoidance Minimization, and/or Mitigation Measures

Noise from project construction activities would be regulated through the Department's Standard Specifications. Section 7-1.101I of the Department's Standard Specifications states that, "…contractors shall comply with all local sound control and noise levels rules, regulations, and ordinances which apply…" and that, "…each internal combustion engine, used for any purpose shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall operate without a muffler."

Section 14-8.02 of the Department's Standard Specifications states that construction noise shall not exceed 86 dBA Leq(h) at 50 feet from the job site activities from 9pm to 6am, and that construction equipment shall use an alternative warning method instead of a sound signal (such as a reverse drive warning buzzer) unless required by safety laws.

CEQA Noise Analysis

As discussed above, the Build Alternative would not result in any adverse noise effects from project operation (i.e., traffic noise impacts). The project would not have a significant noise impact under CEQA.

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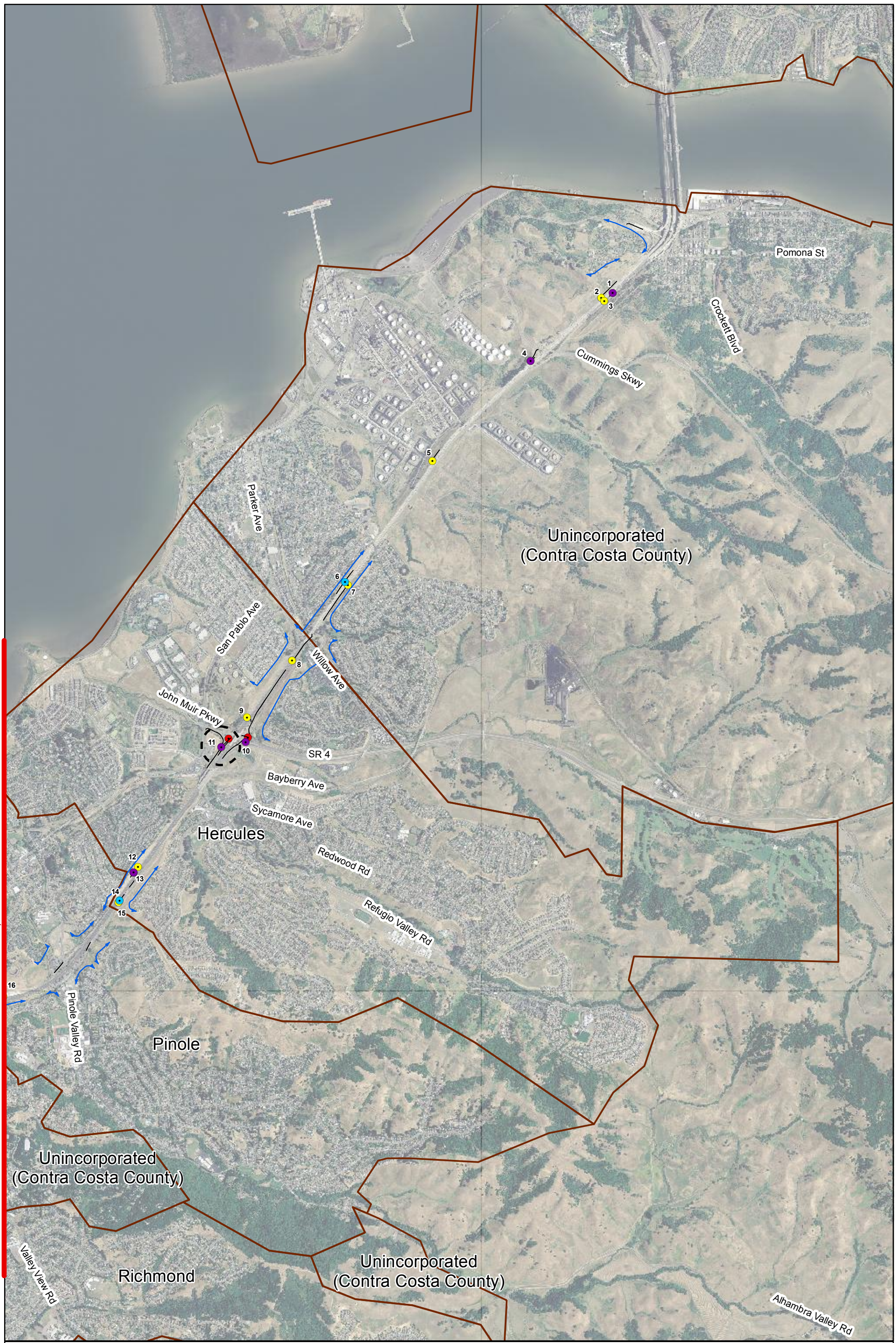

0 500 1,000 2,000 3,000 4,000 Feet

SOURCE: ©2004, Aerial Express Map

SIGN BRIDGE STRUCTURE (GANTRY)

INFORMATION DISPLAY BOARD

VARIABLE ADVISORY SPEED SIGN

VARIABLE MESSAGE SIGN (TYPE 1)

CLOSED CIRCUIT TELEVISION CAMERA

CONDUIT RUN

NOISE SENSITIVE AREAS WITHIN 500 FEET OF PROJECT COMPONENETS

CITY BOUNDARY

LOCATION OF RAMP WIDENING FOR HOV PREFERENTIAL LANE

Figure 2-3
Sheet 1 of 3

Interstate 80 Integrated Corridor Mobility Project

NOISE SENSITIVE AREAS WITHIN 500 FEET OF PROJECT COMPONENTS

Back of Figure 2-3 (Sheet 1 of 3)

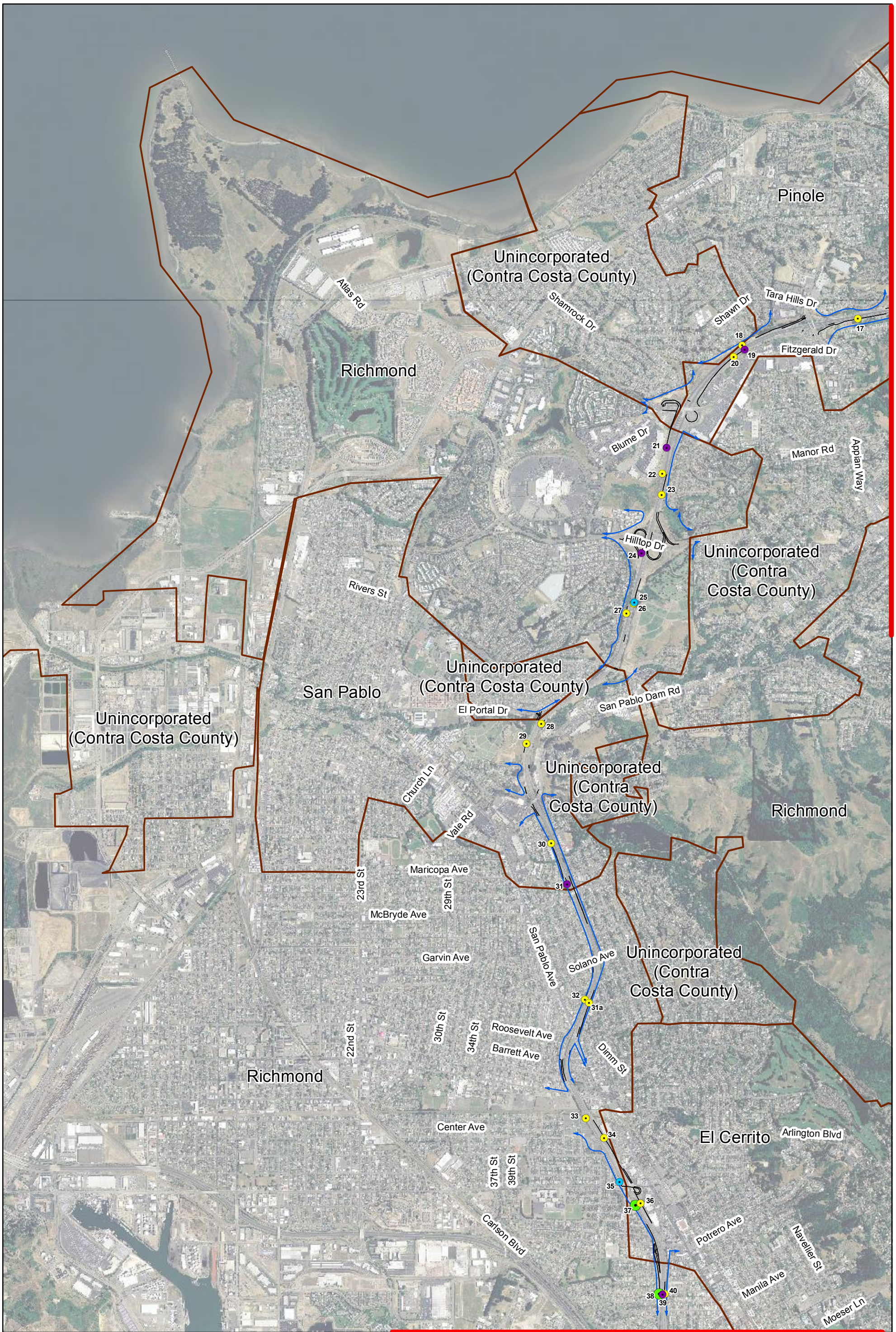

Figure 2-3
Sheet 2 of 3

Interstate 80 Integrated Corridor Mobility Project

NOISE SENSITIVE AREAS WITHIN 500 FEET OF PROJECT COMPONENTS

Back of Figure 2-3 (Sheet 2 of 3)

MATCHLINE FIGURE 2-3, Sheet 2

SOURCE: ©2004, Aerial Express Map

Figure 2-3
Sheet 3

Interstate 80 Integrated Corridor Mobility Project

NOISE SENSITIVE AREAS WITHIN 500 FEET OF PROJECT COMPONENTS

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2.4 Biological Environment

2.4.1 Natural Communities

This section of the document discusses natural communities of concern, with a focus on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors, which are areas of habitat used by wildlife for seasonal or daily migration; and habitat fragmentation, which involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Wetlands and other waters are discussed in Section 2.4.2. Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed in Section 2.4.5, Threatened and Endangered Species.

2.4.1.1 Affected Environment

The following analysis is based on the Natural Environment Study (NES) approved in February 2011(Department, 2011c). The NES is included as **Appendix E**.

The Biological Study Area (BSA) for the project corridor encompasses all areas of ground disturbance that would occur during the construction of the Build Alternative. The BSA extends 100 feet from the edge of the paved freeway surface and/or the edge of any component of the Build Alternative. The BSA encompasses a total area of 453 acres.

Biologists conducted field surveys of the BSA on August 26 and 27, 2008; September 10 and 11, 2008; December 16^{t} and 17, 2008; and February 11, 12, and 13, 2009 to characterize and map the type and quality of habitat.

Biologists identified the following five vegetation communities within the BSA: valley and foothill grasslands, northern coastal salt marsh, north coast riparian scrub, coastal and valley freshwater marsh, and landscaped. With the exception of the portion of the BSA located within the Berkeley Aquatic Park, the majority of the study area is developed with paved roadways and residential, industrial, and commercial land uses.

Table 2.4-1 lists the acreage of natural communities present within the BSA. Principal characteristics and general locations of these communities are presented in the following descriptions. More detailed descriptions of each habitat and vegetation mapping can be found in the NES (see **Appendix E**).

Valley and Foothill Grasslands

Valley and foothill grasslands were observed primarily in the northern portion of the BSA, where less development has occurred. This natural community is dominated by non-native annual grasses and weedy annual and perennial forbs, primarily of Mediterranean origin, that have replaced native perennial grasslands and scrub as a result of human disturbance. Characteristic non-native annual grasses found within the BSA include wild oats (*Avena spp*.), brome grasses (*Bromus spp.*), wild barley (*Hordeum murinum ssp. leporinum*), Italian ryegrass (*Lolium multiflorum*), and fescue (*Vulpia spp*.). Common non-

native forbs include yellow star thistle (*Centaurea solstitialis*), field bindweed (*Convovulus arvensis*), crane's-bill (*Geranium dissectum*), sheep sorrel (*Rumex acetosella*), bur-clover (*Medicago polymorpha*), and filaree (*Erodium spp*.), among others.

Table 2.4-1: Natural Communities within the Biological Study Area

Natural Communities/Land Cover	Total Acreage
Valley and Foothill Grasslands	41.32
Northern Coastal Salt Marsh	0.54
North Coast Riparian Scrub	1.73
Coastal and Valley Freshwater Marsh	0.19
Landscaped	106.05

Northern Coastal Salt Marsh

Northern coastal salt marsh occurs in the southwest portion of the BSA, between El Cerrito and the San Francisco-Oakland Bay Bridge Toll Plaza. This community is typically found along the margins of bays, lagoons, and estuaries that are sheltered from excessive wave action. The lower margin of the community experiences two high tides and two low tides per day. Elevation changes with distance from the shore, producing a gradient of salinity as well as depth and duration of flooding that determines the species of plants, and ultimately animals, found. For example, the lower regions of the marsh support cordgrass (*Spartina foliosa*), pickleweed (*Salicornia virginica*), jumea (*Jaumea carnosa*), California seablite (*Suaeda californica*), and saltgrass (*Distichlis spicata*), which attracts shorebirds and rails; the upper regions of the marsh support California bulrush (*Schoenoplectus californicus*), common cattail (*Typha latifolia*), and carex (*Carex* sp.) which attract passerines (perching birds) and mammals.

North Coast Riparian Scrub

North coast riparian scrub occurs along the drainages that cross or run parallel to the I-80 freeway. The north coast riparian scrub community typically occurs close to river channels and on fine-grained sand and gravel bars with a high water table. It is distributed along and at the mouths of most perennial and many intermittent streams in the Bay Area. Characteristic native species occurring within this community include willow (*Salix* sp.), California blackberry (*Rubus ursinus*), Himalayan blackberry (*Rubus discolor*), and poison oak (*Toxicodendron diversilobum*), among others.

Coastal and Valley freshwater marsh

Coastal and valley freshwater marsh occurs at the intersection of I-80 and SR-4. However, because this area does not support hydrophytic vegetation[1], the coastal and valley freshwater marsh within the BSA is classified as non-wetland waters of the U.S. Emergent vegetation, including cattails (*Typha* sp.), sedges (*Carex* sp.), and willows (*Salix* sp.), often form a dense canopy in this natural community.

[1] Hydrophytic vegetation is the final parameter of the wetland definition. In general terms, hydrophytic vegetation is plant-life that thrives in wet conditions.

Landscaped

Landscaping and planted grasses occur throughout the BSA, including landscaping and erosion control plantings that are immediately adjacent to the shoulder of the I-80 corridor.

Many of the trees adjacent to the proposed device and ramp disturbance locations would be considered protected by the various cities' tree protection ordinances. These protected trees may include landscaped trees or native trees.

Sensitive Natural Communities

Four natural communities of special concern were identified in the California Natural Diversity Database (CNDDB) search of the United States Geological Survey (USGS) Mare Island, Benicia, Richmond, and Oakland West 7.5-minute quadrangle maps (CNDDB 2010): northern coastal salt marsh, coastal brackish marsh, northern maritime chaparral, and valley needlegrass grassland.

The occurrence of northern coastal salt marsh within the BSA is described above.

The other three communities do not occur within the BSA and would not be impacted by the project.

Wildlife Corridors

Given the large amount of development along the I-80 corridor, there is limited connectivity between existing habitat areas in the BSA. There are no linkages between the primary wildlife foraging areas within the BSA. The project corridor is not within any regional conservation plans, such as habitat conservation plans or multiple species conservation plans.

2.4.1.2 Environmental Consequences

Build Alternative

Direct Impacts

Table 2.4-2 identifies the anticipated impacts to the natural communities within the BSA. Two communities, valley and foothill grasslands and landscaped, would be directly impacted by the Build Alternative. Installation of foundations and conduits for the Build Alternative would result in impacts to approximately 3.87 acres of valley and foothill grasslands and approximately 5.25 acres of landscaped areas.

Table 2.4-2: Impacts to Natural Communities

Natural Community	Total Impacts (acres)
Northern Coastal Salt Marsh	-
North Coast Riparian Scrub	-
Coastal and Valley Freshwater Marsh	-
Valley and Foothill Grasslands	3.87
Landscaped	5.25

No trees would be removed as part of the Build Alternative, although trees could be impacted via pruning or from trenching activities associated with conduit installation. Avoidance and minimizations efforts to protect root systems are provided below.

Impacts related to special-status plant and animal species associated with these communities are discussed in Sections 2.4.3, 2.4.4, and 2.4.5.

Indirect Impacts

Indirect impacts to the northern coastal salt marsh could occur during construction. Potential fluid leaks from construction workers parking their vehicles in close proximity to this habitat could result in harmful run-off that degrades the water quality and soil conditions. Additionally, sedimentation could occur as a result of earth moving activities.

Wildlife Corridors

As described above, no wildlife corridors have been identified within the BSA; accordingly, no impacts to wildlife corridors are anticipated.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same BSA, it is likely that the No-Build Alternative would result in impacts (direct and indirect) to the same natural communities that would be affected by the proposed Build Alternative. A calculation of the acreages affected by these projects would be determined under separate environmental review.

2.4.1.3 Avoidance Minimization, and/or Mitigation Measures

Pursuant to California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to sensitive natural communities. These measures are considered part of the project design, as described below.

Storm Water Pollution Prevention

In conformance with Department standards, Storm Water Pollution Prevention Plans (SWPPP) that include erosion control best management practices (BMPs) would be developed to minimize any wind or water-related erosion. The SWPPP would provide guidance for design staff to include provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges. Protective measures shall include, at a minimum:

- No discharge of pollutants from vehicle and equipment cleaning will be allowed into any storm drains or water courses.
- Vehicle and equipment fueling and maintenance operations will be at least 50 feet away from water courses, except at established commercial gas stations or established vehicle maintenance facility.

- Concrete wastes will be collected in washouts and water from curing operations will be collected and disposed of and not allowed into water courses.
- Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require.
- Protection of graded areas from erosion using a combination of silt fences, fiber rolls along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas.
- Spill containment kits will be maintained on site at all times during construction operations and/or staging or fueling of equipment.

All slopes or unpaved areas temporarily affected by the project would be reseeded with native grasses and shrubs to stabilize the slopes and bare ground against erosion. Following construction, native (and non-native if appropriate) plant species would be planted at the disturbed area.

Environmentally Sensitive Areas

Prior to the start of construction, areas containing sensitive habitats adjacent to or within construction work areas would be clearly delineated as environmentally sensitive areas (ESAs) using high-visibility orange fencing. The ESAs would include all potential habitat areas for the threatened and endangered species with the potential to occur along the project corridor (i.e., California red-legged frogs and Alameda whipsnakes). In addition, all hydrologic features within the BSA that have been identified as waters of the U.S. or state waters would be delineated on project design plans and designated ESAs.

The final project plans would depict the locations where ESA fencing would be installed and how it would be installed. The special provisions of the bid package would clearly describe acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within ESAs. The ESA fencing would remain in place throughout the duration of the project-related construction activities to prevent the encroachment of construction equipment/personnel into sensitive areas.

2.4.2 Wetlands and Other Waters

2.4.2.1 Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and surface waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Under Section 404 of the Clean Water Act, discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the California Department of Fish and Game (CDFG), the State Water Resources Control Board (SWRCB), and the Regional Water Quality Control Boards (RWQCB). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section for additional details.

2.4.2.2 Affected Environment

The following analysis is based on the NES approved in February 2011(Department, 2011c). Wetland delineations were conducted within the BSA by consultant biologists on December 16 and 17, 2008 and on February 11, 12, and 13, 2009. The delineations were conducted in accordance with the U.S. Army Corps of Engineers (USACE) guidance. A preliminary Wetland Delineation and Assessment Report is provided in Appendix C of the NES (included as **Appendix E** of this IS/EA).

In all, Waters of the U.S. and State occupy approximately 12.28 acres of the BSA. All conclusions regarding jurisdictional status are preliminary and subject to verification by the USACE and the State. Detailed mapping of the jurisdictional areas is included in the Wetland Delineation and Assessment Report (see **Appendix E**).

Potentially jurisdictional aquatic features identified within the BSA consist of the following: named creeks; un-named drainages; freshwater wetlands; salt marsh; freshwater lakes; and San Francisco Bay. The wetlands within the BSA are perennial (marsh) and vary in size and quality.

The non-wetland waters of the U.S. and State waters include the following drainages within and adjacent to the BSA that cross or run parallel to I-80. All of the major drainages are perennial.

- I-80 Rodeo Creek crossing at Willow Avenue
- I-80 Refugio Creek crossing at north of Sycamore Avenue
- An unnamed creek that splits from Refugio Creek crossing I-80 south of Sycamore Avenue
- I-80 Pinole Creek crossing south of Pinole Valley Road
- San Pablo Creek crossing at the El Portal Drive westbound I-80 on-ramp
- I-80 Wildcat Creek crossing south of San Pablo Dam Road and north of McBryde Avenue
- I-80 Cerrito Creek crossing south of Central Avenue and north of Buchanan Street
- I-80 Codornices Creek crossing south of Buchanan Street and parallel run to the I-80 westbound on-ramp at Buchanan Street
- Berkeley Aquatic Park adjacent to I-80 south of the University Avenue interchange.

2.4.2.3 Environmental Consequences

Build Alternative

Implementation of the Build Alternative would not result in any direct or indirect impacts to jurisdictional waters of the U.S. or State (loss of acreages), including wetlands. No work is proposed to occur within the San Francisco Bay, the Berkeley Aquatic Park, salt marsh, freshwater wetlands, creeks, drainages, and freshwater lakes that may be potential jurisdictional waters of the U.S. or State.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same BSA, it is possible that the No-Build Alternative would result in impacts (direct and indirect) to the jurisdictional waters within the area. A calculation of the acreages affected by these projects would be determined under separate environmental review.

2.4.2.4 Avoidance Minimization, and/or Mitigation Measures

No avoidance, minimization and/or mitigation measures are recommended because no direct or indirect impacts to jurisdictional waters of the U.S. or State are anticipated to occur.

2.4.3 Plant Species

2.4.3.1 Regulatory Setting

The United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see Section 2.4.5, Threatened and Endangered Species, for detailed information regarding these species.

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

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

2.4.3.2 Affected Environment

The following analysis is based on the NES approved in February 2011 (Department, 2011c). The identification of special-status plant species with potential to occur in the region was based on a search of the USFWS Species List Database, the CNDDB, and the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants for the four USGS quadrangles within the BSA: Mare Island, Benicia, Richmond, and Oakland West. Reconnaissance level surveys were also conducted to determine the potential for special-status plant species to occur. The detailed results of these database searches and the reconnaissance level surveys are documented in the NES and are summarized below.

The database searches identified 36 special-status plant species that could potentially occur in the region. **Appendix F** lists each of these species and describes whether or not the species could occur in the BSA.

None of the species are expected to occur in the BSA. Of these 36 species, only two— bent-flowered fiddleneck (*Amsinckia grandiflora*) and robust monardella (*Monardella villosa ssp. Globosa*)—have habitat requirements that are present in the BSA. Although grasslands potentially supporting these species exist in the BSA, the bent-flowered fiddleneck species has not been documented within one mile of the BSA since 1883. Similarly, the last sighting of robust monardella within one mile of the BSA was in 1903.

2.4.3.3 Environmental Consequences

Build Alternative

With respect to plant species, all direct impacts (i.e., trenching, moving project equipment, placing device structures and footings, clearing and grubbing prior to construction work) are considered permanent. Implementation of the Build Alternative would permanently remove approximately 3.87 acres of suitable special-status plant species habitat. Potential indirect effects include disturbances from the generation of dust and degradation of water quality during construction activities.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same BSA, it is possible that the No-Build Alternative would result in impacts to the same special status plant species within the area. A calculation of the acreages affected by these projects would be determined under separate environmental review.

2.4.3.4 Avoidance Minimization, and/or Mitigation Measures

Measures to implement erosion control BMPs and storm water pollution prevention plans would also reduce indirect impacts on special-status plant species.

Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to special-status plant species within the BSA. The following measure is considered part of the project design.

Preconstruction Surveys

Special-Status Plant Species

Preconstruction surveys during the blooming season would be conducted in suitable habitat where construction activities would occur to ensure no special-status plant species would be directly or indirectly affected by the project. If special-status plants are found prior to or during construction activities, a buffer zone shall be clearly delineated as an environmentally sensitive area by a qualified biologist (see discussion above in Section 2.4.1.3).

2.4.4 Animal Species

2.4.4.1 Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service, and the CDFG are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in Section 2.4.5 below. All other special-status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations pertaining to wildlife include the following:

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

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the Fish and Game Code
- Sections 4150 and 4152 of the Fish and Game Code

2.4.4.2 Affected Environment

The identification of special status animal species with potential to occur in the region was based on a search of the USFWS Species List Database, the CNDDB, and the CNPS Inventory of Rare and Endangered Plants for the four USGS quadrangles within the BSA, as well as field reconnaissance surveys, habitat assessments, and the wetland delineation survey completed for the project. The results of these efforts are further discussed in the appropriate sections below, and are documented in the NES.

The database searches identified 41 special-status wildlife species that could potentially occur in the region. **Appendix F** lists each of these species and describes whether or not the species could occur in the BSA. Of these 41 species, 18 special-status wildlife species have the potential to occur in the BSA. Five of those species are listed as endangered or threatened under CESA or FESA and are described in Section 2.4.5, Threatened and Endangered Species. The remaining 13 special-status species are described in this section:

- Monarch butterfly (*Danaus plexippus*)
- Western pond turtle (*Emmys marmorata*)
- Nesting raptors - Coopers hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), white-tailed kite (*Elanus leucurus*), and western burrowing owl (*Athene cunicularia*)
- Nesting passerines - Suisun song sparrow (*Melospiza melodia maxillaris*), Alameda song sparrow (*Melospiza melodia pusillula*), San Pablo song sparrow (*Melospiza melodia samuelis*), and salt marsh common yellowthroat (*Geothlypis trichas*)
- Roosting bats - pallid bat (*Antrozous pallidus*), silver haired bat (*Lasionycteris noctivagans*), and hoary bat (*Lasiurus cinereus*)

All of these species, with the exception of the monarch butterfly, are protected under CESA as California species of concern. The monarch butterfly is considered a special animal by the state. All of the nesting raptors and nesting passerines are also protected under the Migratory Bird Treaty Act (MBTA).

Monarch Butterfly

Overwintering sites in California occur within a mile of the coast, generally consisting of wooded trees of mixed height and trunk diameter, as well as understory brush. Trees such as blue gum (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Cupressus macrocarpa*) are most often used as roosts, as well as other native and non-native species in large groves which provide thermal regulation and cover from predators. Cool moist air that pools in depressions and drainages within forest groves are important requirements for overwintering monarchs. The overwintering season typically occurs between October 1 through February 28 and may vary according to weather conditions.

Within the BSA, monarch butterflies overwinter in the riparian corridor along Codornices Creek in Contra Costa County.

Western Pond Turtle

The western pond turtle occurs throughout California and inhabits rivers, streams, lakes, ponds, wetlands, reservoirs, and brackish estuarine waters. Western pond turtles use aquatic habitat primarily for foraging, thermoregulation, and predator avoidance. Although it is primarily an aquatic species, pond turtles can survive on land or in water, and may remain active during the winter season, depending on environmental conditions. Females travel from aquatic sites into open, grassy areas to lay eggs in shallow nests approximately 600 to 1,300 feet or more from water.

Within the BSA, the seasonal and perennial wetlands at the I-80/SR-4 interchange and San Pablo Creek provide suitable aquatic habitat for the western pond turtle. This species has been reported in Rodeo Creek approximately 2.5 miles east of the BSA.

Nesting Raptors and Migratory Birds

Trees, riparian areas, and man-made bridges within the BSA may provide potential nesting habitat for raptors and birds protected under the MBTA.

No nesting raptors or evidence of nesting raptors were observed during field visits, although Cooper's hawk, white-tailed kite, and northern harrier have all been reported within or adjacent to the BSA (CNDDB 2010).

The red-shouldered hawk and Cooper's hawk nest in riparian corridors, typically choosing the tallest trees in the area. There is suitable nesting habitat present along riparian corridors within the BSA for Cooper's hawk and red-shouldered hawk. White tail kites also choose tall trees but typically at the edge of grasslands

Bat Species

No roosting bat surveys were conducted in the preparation of the NES. However, there is potential that the landscaped and native trees and existing overpass and/or under pass structures within the BSA may provide roosting habitat for protected bat species. In particular, there is a potential for bats to roost in the underpass I-80 crossing at Buchanan Street and Gilman Street.

2.4.4.3 Environmental Consequences

Build Alternative

Monarch Butterfly

The vegetation along Codornices Creek and associated riparian habitat would not be directly impacted by the Build Alternative. However, exhaust and low frequency vibrations, inherent to the operation of heavy construction equipment in this area may disturb and/or dislodge roosting monarchs during the overwintering season (October 1 through February 28). This would increase colony disturbance and butterfly mortality.

Western Pond Turtle

No work is proposed within creeks inhabited by western pond turtle. However, the degradation of water quality from construction-related sediment and runoff could temporarily impact this species.

Nesting Raptors - Nesting Passerines

There is potential for burrowing owls to nest in the valley and foothill grasslands within the BSA. As previously discussed in Section 2.4.1 above, installation of the Build Alternative foundations and conduits would result in impacts to approximately 3.87 acres of valley and foothill grasslands. As a result, there is potential for impacts to approximately 3.87 acres of suitable burrowing owl nesting and foraging habitat within the BSA.

The Build Alternative would not require the removal of any trees within the BSA. As such, permanent impacts to all other nesting raptors and migratory bird species, due to the loss of possible nests and associated eggs and/or nestlings, are not anticipated by the project.

Temporary noise and construction activities within the BSA may preclude or disrupt nesting within the vegetated areas of the BSA (February 1 through August 31).

Roosting Bats There is a potential for bats to roost in the I-80 underpass crossing at Buchanan Street and Gilman Street where an eastbound closed-circuit television camera would be installed (CCTV EB1a). There is a potential for roosting bats to be adversely affected by carbon monoxide emissions from construction vehicles if bats are roosting when installation machinery is parked under the underpass. The Build Alternative would not require the removal of any trees within the BSA. As such, the direct mortality of roosting bats as a result of tree removal is not anticipated by the project.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between the Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same BSA, it is possible that the No-Build Alternative would result in impacts to the same special status animal species within the area. The permanent removal of trees, shrubs, and other vegetation to construct these projects may result in greater impacts to protected birds and bat species when compared to the Build Alternative. A calculation of the acreages affected by these projects would be determined under separate environmental review.

2.4.4.4 Avoidance Minimization, and/or Mitigation Measures

Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to special-status animal species. These measures are considered part of the project design, as described below.

Measures to implement erosion control BMPs and storm water pollution prevention plans would also reduce adverse effects to western pond turtle habitat within the BSA.

Environmental Awareness Training

Before the onset of construction activities, a qualified biologist would conduct an education program for all construction personnel. The training would include a description of special-status species and their potential habitats within or adjacent to the project corridor. A fact sheet would be prepared and distributed to all construction crews conveying: (1) the status of these species and their protection under the Endangered Species Act; (2) the measures to conserve listed species and their habitats as they relate to the work site; and (3) the identification of the habitat boundaries within which construction may occur. Upon completion of the program, personnel would sign a form stating that they attended the program and understand all the avoidance and minimization measures.

Construction Site Management Practices

The following restrictions would be implemented to avoid or minimize effects on listed species and their habitats:

a) A speed limit of 20 miles per hour (mph) in the project footprint in unpaved areas would be enforced to reduce dust and excessive soil disturbance.

b) Construction access, staging, storage, and parking areas would be located within the Caltrans project right-of-way or temporary easements and outside of any designated environmentally sensitive areas (see discussion below). Access routes and the number and size of staging and work areas would be limited to the minimum necessary to construct the project. Routes and boundaries of roadwork would be clearly marked prior to initiating construction or grading.
c) For on-site storage of pipes and conduits and other materials that could provide shelter for listed animals, an open top trailer would be used to elevate the materials above ground. This will reduce the potential for animals to climb into the conduits and other materials.
d) All food and food-related trash items would be enclosed in sealed trash containers and removed completely from the site at the end of each day.
e) No pets from project personnel would be allowed anywhere in the construction areas.
f) No firearms would be allowed in the project corridor except for those carried by authorized security personnel, or local, state or federal law enforcement officials.

Seasonal Work Restrictions

In areas adjacent to salt marsh habitat, work would be restricted to the non-nesting season, from September 1 to January 31. Work outside this window requires preconstruction nest clearance surveys.

No work would be conducted in the area of Codornices Creek during the overwintering season for monarch butterflies (October 1 through February 28).

To the extent practicable, in areas where California red-legged frog may occur, construction would be restricted to April 15 to October 15.

Preconstruction Surveys

Protected Bird Species

If construction activities are scheduled to occur during the nesting season for protected bird species with the potential to occur within the project corridor (February 1 through August 31), a preconstruction nesting bird survey would be performed by a qualified biologist within seven days of ground breaking activities. The preconstruction survey would identify any active nest sites within or immediately adjacent to the project corridor. If no nesting sites are observed, no further action is required and grading would occur within one week of the survey.

If preconstruction surveys indicate that nesting sites would be impacted by construction activities, a no-disturbance buffer would be established around the nest to avoid disturbance or destruction of the nest until after the breeding season or after a wildlife biologist determines that the young have fledged (usually late-June to August). To delineate the buffer zone around a nesting tree, orange construction fencing would be placed at the specified radius from the base of the tree within which no machinery or workers shall intrude. The extent of these buffers would be determined by a wildlife biologist in consultation with the California Department of Fish and Game, and will depend on the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers.

Areas of bare ground or with grass less than six inches in height may attract western burrowing owls during the winter season. If construction is to occur after a period of inactivity and soil is left barren, a burrowing owl habitat evaluation to determine occupancy of the site would be conducted prior to ground disturbance the following season.

Restricted Construction Methods

No pile driving would occur at any of the gantry locations adjacent to salt marsh habitat.

To the extent practicable, nighttime construction will be minimized to avoid effects to nocturnally active species, especially for those areas adjacent to salt marsh habitat. All lighting shall be directed away from potential special-status species habitat when nighttime work is to be conducted.

Predator Perches

To prevent increased predation on threatened and endangered species through the provision of additional artificial perch structures, the project would incorporate anti-predator perching devices on all of the proposed gantries and other sign structures.

Conduit Installation

In general, a trencher machine would be used to create new conduits for the electrical and/or fiber optic lines. In some locations, existing conduit can be used and no ground disturbance would be required. As previously discussed, all work would be relocated to avoid and reduce potential impacts to environmentally sensitive areas.

In order to avoid potential construction-related impacts to protected trees along the project corridor, the project design would include conduit runs that would be routed outside of tree drip lines to the extent practicable. In cases where the conduit cannot be routed away from the tree's drip line, hand digging would be used for placing the conduit to ensure that no root systems in the area are damaged. If necessary, trenchless construction techniques would be used to place the conduit without damaging tree roots. A Department-approved biologist would be on hand during construction activities that could impact trees to oversee hand digging, tree pruning, and other construction activities within tree drip lines.

The electric and communications conduit being placed at the I-80 crossing at Buchanan Street (CCTV EB1a) would be installed using horizontal directional drilling to prevent impacts to bats potentially roosting in the overpass. The staging for the work would be placed on the east side of the overpass to avoid adding harmful exhaust into the area.

2.4.5 Threatened and Endangered Species

2.4.5.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code USC, Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA), are required to consult with the USFWS and NOAA Fisheries Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the

continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion (BO) or an Incidental Take Statement. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The CDFG is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of the FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

2.4.5.2 Affected Environment

The identification of threatened and endangered species with potential to occur in the region was based on a search of the USFWS Species List Database, the CNDDB, and the CNPS Inventory of Rare and Endangered Plants for the four USGS quadrangles within the BSA, as well as field reconnaissance surveys, habitat assessments, and the wetland delineation survey completed for the project. The results of these efforts are further discussed in the appropriate sections above, and are documented in the NES.

As previously discussed, there are no threatened or endangered plant species with the potential to occur within the BSA. The database searches identified 41 special-status wildlife species that could potentially occur in the region. **Appendix F** lists each of these species and describes whether or not the species could occur in the BSA. Of these 41 wildlife species, five are listed as endangered or threatened under CESA or FESA:

- California red-legged frog (*Rana draytonii*)
- Alameda whipsnake (*Masticophis lateralis euryxanthus*)
- California clapper rail (*Rallus longirostris obsoletus*)
- Salt marsh harvest mouse (*Reithrodontomys raviventris*)
- California black rail (*Laterallus jamaicensis coturniculus*).

Biological Assessment

A Biological Assessment (BA) has been prepared as part of the consultation process with the USFWS to determine whether the Build Alternative is likely to jeopardize the continued existence of threatened or endangered species or adversely affect critical habitat. Consultation with the USFWS has been initiated to ensure that the Build Alternative would not cause adverse impacts to federally listed species. Chapter 3 includes the correspondence with USFWS to date.

California red-legged Frog

The California red-legged frog (CRLF) is federally listed as threatened. CRLF are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators. Upland CRLF habitat includes areas up to 295 feet from a stream corridor or breeding pond and includes natural features, such as boulders, rocks, trees, shrubs, and logs. In general, densely vegetated terrestrial areas within the riparian corridor provide important sheltering habitat during the winter flooding of the streams. Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the species throughout its range.

Within the BSA, CRLF habitat is present in the southeast quadrant of the I-80/SR-4 interchange in a tributary to Refugio Creek that supports deep pools. In this area there is a documented occurrence (#407, CNDDB 2010) reporting the identification 2 adults and 9 juvenile CRLF in the year 2000. There are no known occurrences of CRLF in the pond in the northeastern quadrant of the I-80/SR-4 interchange; however, this area is hydrologically connected to the pond on the southeastern quadrant. As such, both areas have potential to be occupied by CRLF. Although the grasslands adjacent to the ponds provide potential upland habitat for CRLF, the quadrants are separated by heavily used roadways that make the movement of CRLF from one quadrant to the other unlikely.

There is also the potential for CRLF to occur in the upper watersheds of the creeks that traverse the BSA, such as San Pablo Creek. The nearest documented occurrence of CRLF in these upper watershed areas was a 2008 sighting near San Pablo reservoir, approximately four miles from the BSA. For individual frogs to access the BSA from this area, they would have to be washed downstream through four miles of urbanized creek.

The closest USFWS-designated critical habitat for CRLF (CSS-1) is located approximately two miles east of the BSA. Given that this habitat is located well outside the BSA, it is not discussed further in this assessment.

Alameda Whipsnake

The Alameda whipsnake is both state and federally listed as threatened. The Alameda whipsnake typically occupies habitats on east, southeast, south, and southwest facing slopes that contain coastal scrub and chaparral and rock outcrops. Vegetation communities (e.g., annual grassland, blue oak-foothill pine, blue oak woodland, coastal oak woodland, valley oak woodland, eucalyptus, redwood, and riparian communities) adjacent to scrub habitat is considered a feature essential to the conservation of the Alameda whipsnake.

There are reported sightings of the Alameda whipsnake east and northeast of the northern portion of the BSA. The closest documented occurrence (AWS #74, CNDDB 2010) was in 2002, approximately 3.25 miles east of the project BSA, just south of Franklin Canyon Road. Because of the relative proximity to the nearest reported occurrence, the presence of the Alameda whipsnake is likely within potential foraging habitats in the BSA.

No Critical Habitat occurs for the Alameda whipsnake within or adjacent to the BSA.

California Clapper Rail

The California clapper rail is both state and federally listed as endangered. The typical habitat for this species is salt marsh broken up by tidal sloughs, where cordgrass and pickleweed dominate. The California clapper rail tends to concentrate along edges of tidal creeks or marshes during the breeding season. Nests are usually built in dense cover above the high water mark. In Alameda County, the California clapper rail is known to breed in the Emeryville Crescent, and potentially forage in the salt marsh habitat areas west of the BSA (CCR #79, USFWS 2010b).

No Critical Habitat occurs for the California clapper rail within or adjacent to the BSA.

Salt Marsh Harvest Mouse

The salt marsh harvest mouse is both state and federally listed as endangered. The salt marsh harvest mouse inhabits tidal and non-tidal salt and brackish marshes around San Francisco Bay. Optimal habitat for this species typically contains a dense mat of vegetation cover and a network of open areas, usually of pickleweed. Mice have also been observed to move into adjoining grasslands during the highest winter tides. Subsidence and diking has removed most of the habitat for the salt marsh harvest mouse and few mice can survive in the created wetlands that do not support salt tolerant upland species.

The salt marsh harvest mouse was reported at the Emeryville Crescent salt marsh in 1982 and 1987 (SMHM #102, CNDDB 2010). There are approximately 0.54 acres of suitable salt marsh harvest mouse habitat within the BSA.

California Black Rail

The California black rail is state listed as threatened. This species occupies tidal and freshwater marshes in coastal California between Bodega Bay and Morro Bay and inland at the Salton Sea and lower Colorado River. Drastic population declines have been recorded throughout its range, corresponding with the widespread loss of marsh habitat to agriculture, salt-production and urban development. Nesting habitat generally consists of a dense cover of pickleweed, bulrush, saltgrass and/or cattails near the upper limits of tidal flooding.

In Alameda County, rails are known to breed in the Emeryville Crescent, and potentially forage in the salt marsh habitat areas west of the BSA (USFWS 2010). There are approximately 0.54-acres of suitable black rail habitat within the BSA.

2.4.5.3 Environmental Consequences

Build Alternative

California Red-legged Frog

The Build Alternative would permanently impact approximately 0.0017 acres and temporarily impact 1.09 acres of CRLF upland dispersal habitat. Effects to habitat would be associated with the placement of the Intelligent Transportation Systems devices along the freeway right-of-way. Permanent impacts to a federally listed threatened or endangered species are considered a significant adverse impact.

Construction vehicle traffic, vehicle parking, and staging also could generate construction-related sediment or storm water runoff, which could indirectly affect adjacent suitable CRLF habitat by degrading water quality.

Alameda Whipsnake

The Build Alternative would permanently impact approximately 0.0047 acres and temporarily impact 1.26 acres of Alameda whipsnake upland foraging habitat. Effects to habitat would be associated with the placement of the Intelligent Transportation Systems devices along the freeway right-of-way. Permanent impacts to a federally listed threatened or endangered species are considered a significant adverse impact. Construction vehicle traffic, vehicle parking, and staging also could generate construction-related sediment or storm water runoff, which could indirectly affect adjacent suitable whipsnake habitat by degrading water quality.

California Clapper Rail

No direct displacement of California clapper rail habitat would occur from the implementation of the Build Alternative.

Construction noise could potentially affect individual clapper rails in the adjacent salt marsh habitat. There is also a potential that clapper rails would be indirectly impacted by the predator perches provided by the Build Alternative.

Salt Marsh Harvest Mouse

No direct displacement of salt marsh harvest mouse habitat would occur from the implementation of the Build Alternative. However, there is potential that salt marsh harvest mice would be indirectly impacted by the Build Alternative where predator perches are provided. Permanent impacts to a federally listed threatened or endangered species are considered a significant adverse impact.

Construction vehicle traffic, vehicle parking, and staging also could generate construction-related sediment or storm water runoff, which could indirectly affect adjacent suitable salt marsh harvest mouse habitat by degrading water quality.

California Black Rail

No direct displacement of California black rail habitat would occur from the implementation of the Build Alternative.

Construction noise could potentially affect individual black rails in the adjacent salt marsh habitat. There is also a potential that black rails would be indirectly impacted by the predator perches provided by the Build Alternative.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). As these improvements would be located within the same BSA, it is possible that the No-Build Alternative would result in impacts to the same threatened and endangered species within the area. A calculation of the acreages affected by these projects would be determined under separate environmental review.

2.4.5.4 Avoidance Minimization, and/or Mitigation Measures

Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to threatened or endangered animal species. These measures are considered part of the project design, as described below . As a result, the Build Alternative is not anticipated to result in the "take" of any of the listed species described in this section. The project effects are primarily temporary and discountable with the avoidance and minimization measures in place, and the permanent effects are insignificant and limited to very small discreet locations.

Preconstruction Surveys

Special-Status Animal Species

Preconstruction surveys would be conducted by a U.S. Fish and Wildlife Service (USFWS)-approved biologist immediately prior to the initiation of any ground disturbing activities within or adjacent to suitable habitat for special-status animal species. Visual encounter surveys would be conducted within areas subject to ground disturbing activities. All suitable aquatic and upland habitat including refugia habitat such as under shrubs, downed logs, small woody debris, burrows, etc., would be thoroughly inspected. If a special-status species is observed, the individual(s) would not be captured or handled without authorization from the USFWS, and would be allowed to move away on its own.

Avoidance of Entrapment

To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep would be covered at the close of each working day with plywood or other suitable material, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled they must be thoroughly inspected for trapped animals. In addition, the contractor would seal (using tape at both ends) all pipes or tubing 4 inches or greater to prevent animals from entering the pipes at night. All pipes, culverts, or similar structures stored overnight would be inspected before they are subsequently moved, capped, and/or buried. If at any time a listed species is discovered, the Resident Engineer and USFWS-approved biologist would be immediately informed. The animal would be allowed to move out of the area on its own.

Wildlife Exclusion Fencing

Specific areas that may be in proximity of or adjacent to special-status animal species habitat may require the installation of wildlife exclusion fencing. These areas would be identified by a USFWS-approved biologist and shown on the project design plans. The installation of the fencing would be directed by the qualified biologist and the Department's Resident Engineer based on habitat suitability. The special provisions of the bid solicitation package would clearly describe acceptable fencing material and proper fencing installation and maintenance.

California red-legged frog exclusion fencing consists of silt fence that extends 20 feet beyond the area of construction activities in specific locations, with the ends angled back towards the habitat to direct movement back to the aquatic habitat. When construction activities in or adjacent to Alameda whipsnake habitat are anticipated to last longer than 10 days, exclusion fencing would consist of plywood.

The fencing would remain in place throughout the duration of project-related construction activities, and would be regularly inspected and maintained. The fencing would be completely removed upon completion of project. The topography and grade would be restored to preconstruction conditions, and the areas revegetated to preconstruction condition or better.

Erosion Control Materials

To prevent animals from becoming entangled or trapped in erosion control materials, plastic mono-filament netting (i.e., erosion control matting) or similar material would not be used. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

Construction Monitoring

A USFWS-approved biologist would be present on site during active construction in areas identified as potential special-status animal species habitat. The biologist would conduct work area clearance surveys at the beginning of each day and regularly throughout the workday during active construction within or adjacent to suitable habitat areas.

If special-status animal species are observed during the course of active construction, all construction activities within 50 feet of the animal(s) would be stopped. Using best professional judgment, the USFWS-approved biologist may determine that project activities can be resumed without harming or injuring the animal(s). At no time shall work occur within 50 feet of the animal without the biological monitor present. The animal(s) would not be captured or handled without authorization from the USFWS, and would be allowed to move away on its own.

Conduit Installation

All trenching would be conducted on the side of roadways furthest from identified California red-legged frog breeding habitat, where possible. Otherwise, horizontal directional drilling[2] would be used in areas closer to this sensitive habitat. Horizontal directional drilling would be used to install conduit between the Powell Street and Ashby Avenue interchanges (a distance of approximately 1 mile) and along the south side of Buchanan Street between I-80 and I-580 (a distance of approximately 300 feet). All directional drilling adjacent to salt marsh habitat would be conducted on the east side of the frontage road to the westbound lanes.

Any removal of vegetation near Alameda whipsnake habitat would be conducted using hand tools (i.e., weed-whacker).

Measures to implement erosion control BMPs and storm water pollution prevention plans would also reduce indirect impacts on special-status animal species habitat within the BSA.

[2] Horizontal directional drilling is a steerable, trenchless method of installing underground conduits with minimal impact on the surrounding area.

2.4.6 Invasive Species

2.4.6.1 Regulatory Setting

On February 3, 1999, President Clinton signed EO 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration guidance issued August 10, 1999 directs the use of the state's noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a project.

2.4.6.2 Affected Environment

The following analysis is based on the NES approved in February 2011 (Department, 2011c). Reconnaissance level surveys of the BSA were conducted to determine the potential for invasive plant species to occur in the BSA.

Weedy, non-native grasses are dominant throughout the upland portions of the BSA and are particularly dense in the northern portion of the BSA. The presence and density of the weeds can be attributed to the intense and frequent disturbance of native plant communities by human activities. Non-native landscaped plantings such as Pines (*Pinus* spp.) and Eucalyptus (*Eucalyptus* spp.) trees are also common immediately adjacent to I-80 in the central and southern portions of the BSA. In addition, five exotic, invasive plant species identified by the California Invasive Plant Council were observed in the BSA.

- Pampas grass (Cortaderia selloana)
- Wild fennel (*Foeniculum vulgare*)
- Himalayan blackberry (*Rubus discolor)*
- Atlantic or smooth cordgrass (*Spartina alterniflora)*
- Black mustard (*Brassica nigra)*

2.4.6.3 Environmental Consequences

Build Alternative

Construction activities may introduce or spread noxious weeds (non-native, invasive plants) into currently uninfested areas within or adjacent to the BSA. Once established, these weeds may invade wildlands, potentially degrading existing habitat for special-status plants and animals. The spread of noxious weeds could also result in a reduction or elimination of species diversity or abundance within the BSA and adjacent areas.

None of the species on the California list of noxious weeds are currently used by the Department for erosion control or landscaping, and would not be used in areas that would be temporarily disturbed during construction and require restoration.

No-Build Alternative

The No-Build Alternative would include planned and funded projects along the I-80 corridor between Carquinez Bridge and the San Francisco-Oakland Bay Bridge Toll Plaza (see Chapter 1). Construction activities associated with these projects would have the same potential to introduce or spread noxious weeds (non-native, invasive plants) into currently uninfested areas within or adjacent to the BSA. However, the same avoidance measures prescribed by the Department and E.O. 13112 would be applicable to these projects; thereby reducing potential impacts related to invasive species.

2.4.6.4 Avoidance Minimization, and/or Mitigation Measures

Avoidance measures discussed in Section 2.4.1 regarding erosion control, storm water pollution prevention plans, replanting and re-seeding disturbed areas, and restrictions of construction activities will help to reduce adverse effects from invasive species.

To minimize the dispersal of invasive species, construction supervisors and managers shall be educated on weed identification and the importance of controlling and preventing the spread of noxious weeds. Areas with populations of high-priority noxious weed infestations shall be identified and flagged for easy identification by construction crews. Construction equipment shall be cleaned after leaving areas with high-priority noxious weed infestation areas.

In addition, in compliance with the EO 13112, and subsequent guidance from the FHWA, the landscaping and erosion control included in the project will not use species listed as noxious weeds. Erosion control species would be certified “weed free” to reduce the chances of introducing a new invasive species to the area. In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or adjacent to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

2.5 Cumulative Impacts

2.5.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

Cumulative Analysis

This cumulative analysis determines whether the I-80 ICM project in combination with other approved or foreseeable projects would result in a significant cumulative impact, and, if so, whether the Build Alternative's contribution to the significant cumulative impact would be cumulatively considerable. Reasonably foreseeable future projects are defined as the projects assumed in the No-Build Alternative described in Chapter 1, including the other system management strategies that are planned or have been implemented within the project corridor and connecting arterial roadways. The planned and funded projects located within or near the project corridor are anticipated to be constructed by the year 2015.

Planned developments:

- New Town Center (City of Hercules)
- Hilltown (City of Hercules)
- Gateway at Emeryville (City of Emeryville)

Planned vehicular transportation improvements:

- I-80/Powell Street eastbound off-ramp widening
- I-80/Gilman interchange reconfiguration
- I-80/Central Avenue interchange modification
- I-80/San Pablo Dam Road interchange modification
- I-80/Pinole Valley Road eastbound on-ramp improvements

- I-80 eastbound HOV lane, SR-4 to Carquinez Bridge
- Planned pavement maintenance project on I-80, from Alameda County post mile 2.5 to post mile 8.0
- Planned pavement resurfacing on I-80 in Oakland, Emeryville, Berkeley and Albany.

Planned other alternative mode of transportation improvements:

- Planned bicycle and pedestrian pathways to be located along the south side of I-80 in conjunction with the San Francisco-Oakland Bay Bridge East Span Replacement Project
- Planned bicycle and pedestrian I-80 overcrossing located to the south of Ashby Avenue
- Richmond Parkway transit center
- Central Richmond greenway and Class I bicycle trail
- The Refugio bridge bicycle, pedestrian, and vehicle connectivity project in Hercules
- Planned plant establishment project for shoreline habitat planting in Oakland and Emeryville

System management strategies:

- I-80 Traffic and Transit Information Traffic Operations Systems (TOS) project
- San Pablo Corridor Arterial and Transit Improvement project
- Richmond Parkway Transit Center project

2.5.1.1 No Adverse Effect

If the project would not result in a direct or indirect impact on a resource, then it will not contribute to a cumulative impact on that resource. The environmental analysis conducted for the project has determined that the project would not result in direct or indirect impacts on any resource, with the exception of paleontology and biological resources.

The environmental resource areas for which the project has been found to have no adverse effect include:[1]

- Land Use
- Traffic
- Visual
- Cultural Resources
- Hydrology and Floodplains
- Water Quality and Storm water runoff
- Geology/Soils/Seismicity/Topography
- Hazardous Waste/Materials
- Air Quality
- Noise
- Growth

[1] The project has been found to either have no effect or no adverse effect after implementation of the Department's Standard Provisions and/or compliance with required regulations on the resources identified. Therefore the project would not contribute to a cumulative impact on these resources.

- Farmlands and Timberlands
- Utilities and Emergency Services
- Wetlands and Other Waters

The potential for the project to contribute to cumulative effects on paleontological and biological resources are discussed in more detail below. Visual resources are also discussed below because the Visual Impact Assessment identified a cumulative issue of concern.

2.5.1.2 Visual Resources

The Build Alternative would not result in an adverse effect to visual resources. A cumulative effect could result by creating signs within the corridor that are redundant and/or no longer needed. As such, the Visual Impact Assessment prepared for the project identified a minimization measure that would require a sign inventory to determine if any existing signs, poles, and other vertical structures could be eliminated, thereby reducing visual clutter (see Section 2.5.2 below).

2.5.1.3 Paleontology

The resource study area for paleontological resources is the I-80 corridor plus a 0.25-mile buffer on either side of the freeway, as described in the Paleontological Identification Report. The study area contains several geologic formations that have a high paleontological sensitivity, including the Pleistocene alluvial fan deposits, Holocene to Pleistocene alluvial fan deposits, and Pre-Quaternary deposits (of the Tertiary Period). Construction activities associated with the Build Alternative could impact unknown paleontological resources within these highly sensitive geologic units. Impacts to fossils may occur by destroying them or otherwise altering them in such a way that their scientific value is lost.

The implementation of **Mitigation Measure PAL-1** would avoid potential adverse effects on previously undiscovered paleontological resources that might be unearthed during the construction process. The preparation of a Paleontological Evaluation Report (PER) and subsequent paleontological mitigation program (PMP) would set forth specific direction to ensure that the excavation contractor and associated construction personnel are prepared to identify potential resources in the field and are clear about how such unanticipated discoveries are to be treated. Measures contained in the PMP would reduce potential paleontological impacts by allowing for the recovery of fossil remains and associated specimen data and corresponding geologic and geographic site data that otherwise would be lost. The required provisions set forth by the Department for the preparation of the PER and PMP, and the implementation of **Mitigation Measure PAL-1**, would fully offset the potential adverse effects of the project to paleontological resources, resulting in no contribution to cumulative impacts.

2.5.1.4 Natural Communities

The resource study area for natural communities is equivalent to the Biological Study Area (BSA) defined in Section 2.4.1.1.[2] Biologists identified the following five vegetation communities within the BSA: valley and foothill grasslands, northern coastal salt marsh, north coast riparian scrub, coastal and valley freshwater marsh, and landscaped. The majority of the study area is developed with paved roadways and residential, industrial, and commercial land uses. Two communities, valley and foothill grasslands and

[2] The BSA for the project corridor encompasses all areas of ground disturbance that would occur during the construction of the Build Alternative. The BSA extends 100 feet from the edge of the paved freeway surface and/or the edge of any component of the Build Alternative.

landscaped, would be directly impacted by construction activities associated with the Build Alternative. Indirect impacts to the northern coastal salt marsh could also occur during construction (see Section 2.4.1.2). Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to sensitive natural communities that would fully offset the adverse effects of the project, resulting in no contribution to cumulative impacts. These measures are considered part of the project design, as described in Section 2.4.1.3.

2.5.1.5 Plant Species

The resource study area for special-status plant species is equivalent to the BSA defined in Section 2.4.1.1. No special-status plant species are expected to occur in the BSA. However, two species in the region— bent-flowered fiddleneck (*Amsinckia grandiflora*) and robust monardella (*Monardella villosa ssp. Globosa*)—have habitat requirements that are present in the BSA. Implementation of the Build Alternative would permanently remove approximately 3.87 acres of suitable special-status plant species habitat. Potential indirect effects include disturbances from the generation of dust and degradation of water quality during construction activities. Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to special-status plant species, which fully offset the adverse effects of the project, resulting in no contribution to cumulative impacts. These measures are considered part of the project design, as described in Section 2.4.3.4.

2.5.1.6 Animal Species

The resource study area for special-status animal species is equivalent to the BSA defined in Section 2.4.1.1. Eighteen special-status wildlife species have the potential to occur in the BSA. Five of those species are listed as endangered or threatened under CESA or FESA and are included in the discussion below (see Section 2.5.1.7). The remaining 13 special-status species include the monarch butterfly, western pond turtle, nesting birds and roosting bats. Implementation of the Build Alternative would permanently remove approximately 3.87 acres of suitable burrowing owl nesting and foraging habitat within the BSA. Potential indirect effects include disturbances from the generation of noise and dust, and the degradation of water quality during construction activities. Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to special-status animal species, which fully offset the adverse effects of the project, resulting in no contribution to cumulative impacts. These measures are considered part of the project design, as described in Section 2.4.4.4.

2.5.1.7 Threatened and Endangered Species

The resource study area for threatened and endangered species is equivalent to the Biological Study Area (BSA) defined in Section 2.4.1.1. The following five species were identified as potentially occurring within the BSA: California red-legged frog (Rana draytonii), Alameda whipsnake (Masticophis lateralis euryxanthus), California clapper rail (Rallus longirostris obsoletus), salt marsh harvest mouse (Reithrodontomys raviventris), California black rail (Laterallus jamaicensis coturniculus). The Build Alternative would result in the direct displacement of California red-legged frog and Alameda whipsnake habitat. Potential indirect effects include disturbances from the generation of noise and dust, and the degradation of water quality during construction activities. Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to

threatened and endangered animal species, which fully offset the adverse effects of the project, resulting in no contribution to cumulative impacts. These measures are considered part of the project design, as described in Section 2.4.5.4.

2.5.2 Avoidance, Minimization and/or Mitigation Measures

The avoidance, minimization and/or mitigation measures included in Sections 2.2 through 2.4 are expected to fully offset potential adverse effects of the Build Alternative resulting in no contribution to cumulative impacts.

In order to minimize potential cumulative effects with respect to visual clutter within the project corridor, a sign inventory would be completed during the design phase of the project to determine if any existing signs, poles, and other vertical structures can be eliminated to reduce visual clutter and view blockage.

2.6 Climate Change (CEQA)

While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 – tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with greenhouse gas emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by Environmental Protection Agency in December 2007 and efforts to overturn the decision had been unsuccessful. See *California v. Environmental Protection Agency*, 9th Cir. Jul. 25, 2008, No. 08-70011. On January 26, 2009, it was announced that EPA would reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. On June 30, 2009 EPA granted California the waiver. California is expected to enforce its standards for 2009 to 2011 and then look to the federal government to implement equivalent standards for 2012 to 2016. The granting of the waiver will also allow California to implement even stronger standards in the future. The state is expected to start developing new standards for the post-2016 model years later this year.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases. " Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this executive order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHG as a pollutant under the Clean Air Act (Massachusetts vs. Environmental Protection Agency et al., 549 U.S. 497 (2007).

The court ruled that GHG does fit within the Clean Air Act's definition of a pollutant, and that the EPA does have the authority to regulate GHG. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009. [3]

According to *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), an individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may participate in a potential impact through its incremental contribution combined with the contributions of all other sources of GHG. In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." See CEQA Guidelines sections 15064(i)(1) and 15130. To make this determination the incremental impacts of the proposed project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects in order to make this determination is a difficult if not impossible task.

As part of its supporting documentation for the Draft Scoping Plan, CARB recently released an updated version of the GHG inventory for California (June 26, 2008). Shown below is a graph from that update that shows the total GHG emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.

[3] http://www.epa.gov/climatechange/endangerment.html

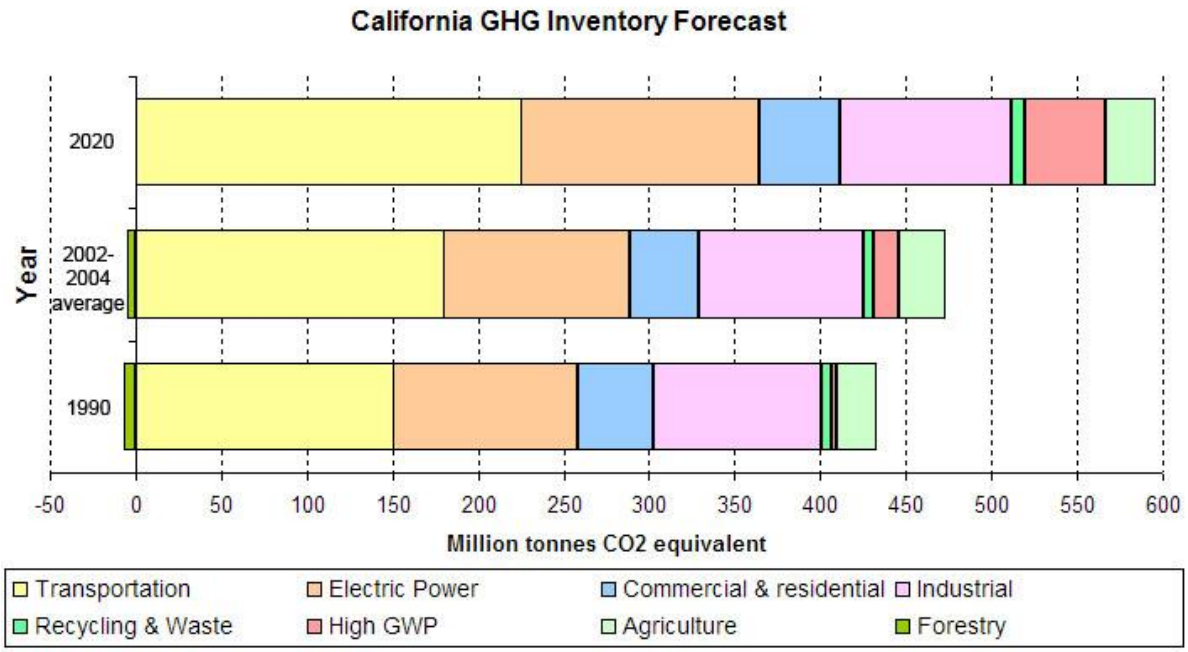


Figure 2-4: California Greenhouse Gas Inventory

Taken from : http://www.arb.ca.gov/cc/inventory/data/forecast.htm

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: http://www.dot.ca.gov/docs/ClimateReport.pdf

2.6.1 Project Analysis

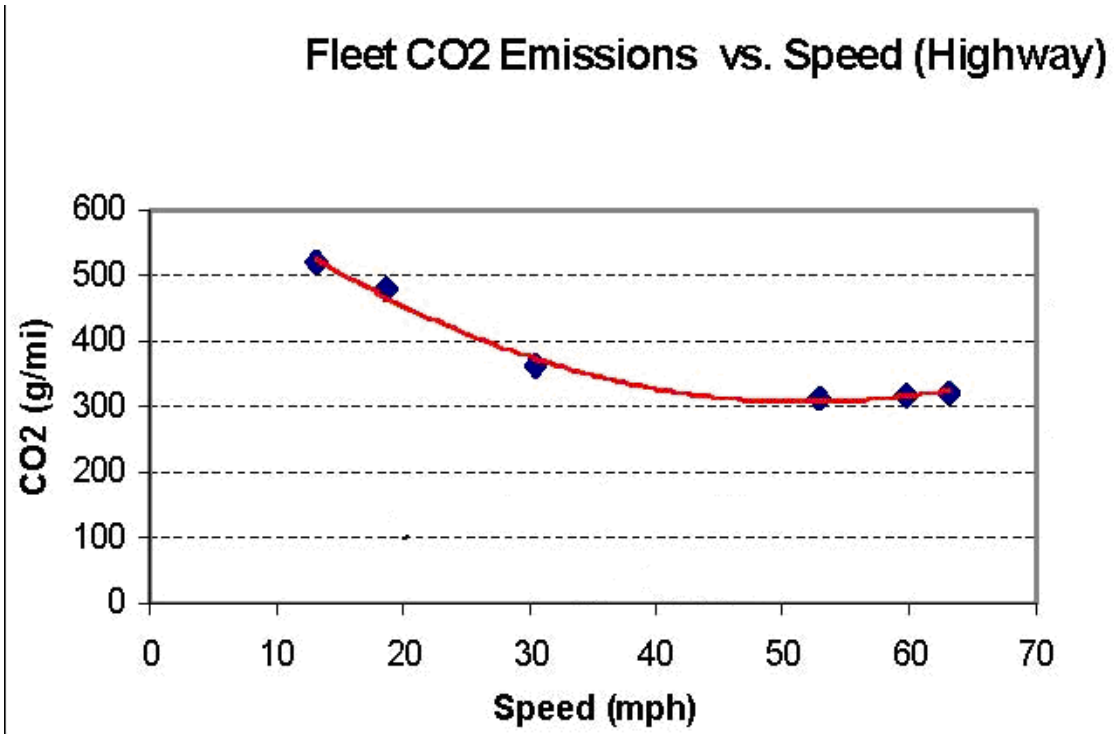
Transportation system efficiency is one of the key strategies in the Department's Climate Action Program to reduce GHG emissions. As shown in Figure 2-6, below, the highest levels of carbon dioxide from automobiles occur at stop-and-go speeds (0-25 miles per hour). To the extent that a project relieves congestion in highly travelled corridors, GHG emissions, particularly CO2, may be reduced. In the project corridor, where constraints prevent widening, congestion relief is achieved through operational improvements that reduce travel times.

As described in Section 2.2.3, under year 2015 recurring (non-incident) conditions, the Build Alternative would reduce vehicle hours of delay by 22 percent in the morning peak period and by 10 percent in the evening peak period on the I-80 freeway. Network-wide, the build Alternative is expected to result in an 8 percent reduction in vehicle hours of delay during both the morning and evening peak periods.

In terms of average vehicle speeds on the I-80 freeway, the Build Alternative would result in a 5 percent increase (2.0 miles per hour) during the morning peak period and a 6 percent increase (1.6 miles per hour) in the evening peak period. Although isolated delays are expected when ramps are metered, motorists

would experience an overall travel savings since delays on the freeway would be reduced. Similarly, while there would be a slight increase in delay on local arterials, the affected motorist would experience an overall reduction in delay during their travels in the peak period because of the network-wide reductions in vehicle hours of delay.

In addition, the Build Alternative would also reduce the impact of non-recurring or incident-related traffic congestion. Under the incident scenario, the Build Alternative would reduce vehicle hours of delay on westbound I-80 by 12 percent, as compared to the No-Build scenario. Similarly, average travel time from the Carquinez Bridge to the San Francisco-Oakland Bay Bridge Toll Plaza during an incident would decrease by 13 percent along westbound I-80.



Source: Center for Clean Air Policy—
http://www.ccap.org/Presentations/Winkelman%20TRB%202004%20(1-13-04).pdf

Figure 2-5: Fleet CO2 Emissions vs. Speed (Highway)

Transit Alternatives

Expansion of bus and rail transit services along the I-80 corridor would reduce the number of personal vehicles on the freeway and connecting arterials, thereby reducing the amount of GHG emissions. The U.S. EPA estimates that an individual who leaves their car at home for just two days a week will reduce GHG emissions by an average 1,600 pounds per year.4 There are a number of transit services expansion

[4] USEPA Climate Change: What You Can Do on the Road (web site).

projects in the areas surrounding I-80 corridor that are being studied or have been approved. These transit services expansion projects are being pursued by other agencies and organizations, with input from the Department, but are not part of the proposed I-80 ICM project.

Operational Emissions

The I-80 ICM project is expected to improve traffic flow by enhancing operations and improving travel times in I-80 corridor. This improvement in traffic flow, without an increase in vehicle miles traveled, would result in long-term GHG reduction benefits. The reduction in GHG emissions would support the strategies of the Department's Climate Action Program.

Construction Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions would be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. Although compliance with the Department's Standard Specifications and implementation of BAAQMD control measures would be expected to minimize construction-related emissions, the I-80 ICM project would result in a temporary increase in GHG emissions during construction. Although construction emissions would be unavoidable, the project would result in long-term GHG reduction benefits, as described above.

CEQA Conclusion

The proposed project is expected to improve traffic flow and decrease overall congestion in the project area. The project is not expected to increase operational greenhouse gas emissions. Caltrans is not able to make a determination regarding the significance of the project's direct impact and its contribution on the cumulative scale to climate change. Caltrans is committed to implementing measures to help reduce greenhouse gas emissions. These measures are outlined in the following discussions.

AB 32 Compliance

Caltrans continues to be actively involved on the Governor's Climate Action Team as CARB works to implement the Governor's Executive Orders and help achieve the targets set forth in AB 32. Many of the strategies Caltrans is using to help meet the targets in AB 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger's Strategic Growth Plan calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways, including $100.7 billion in transportation funding during the next decade. As shown on the figure below, the Strategic Growth Plan targets a significant decrease in traffic congestion below today's level and a corresponding reduction in GHG emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic

Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

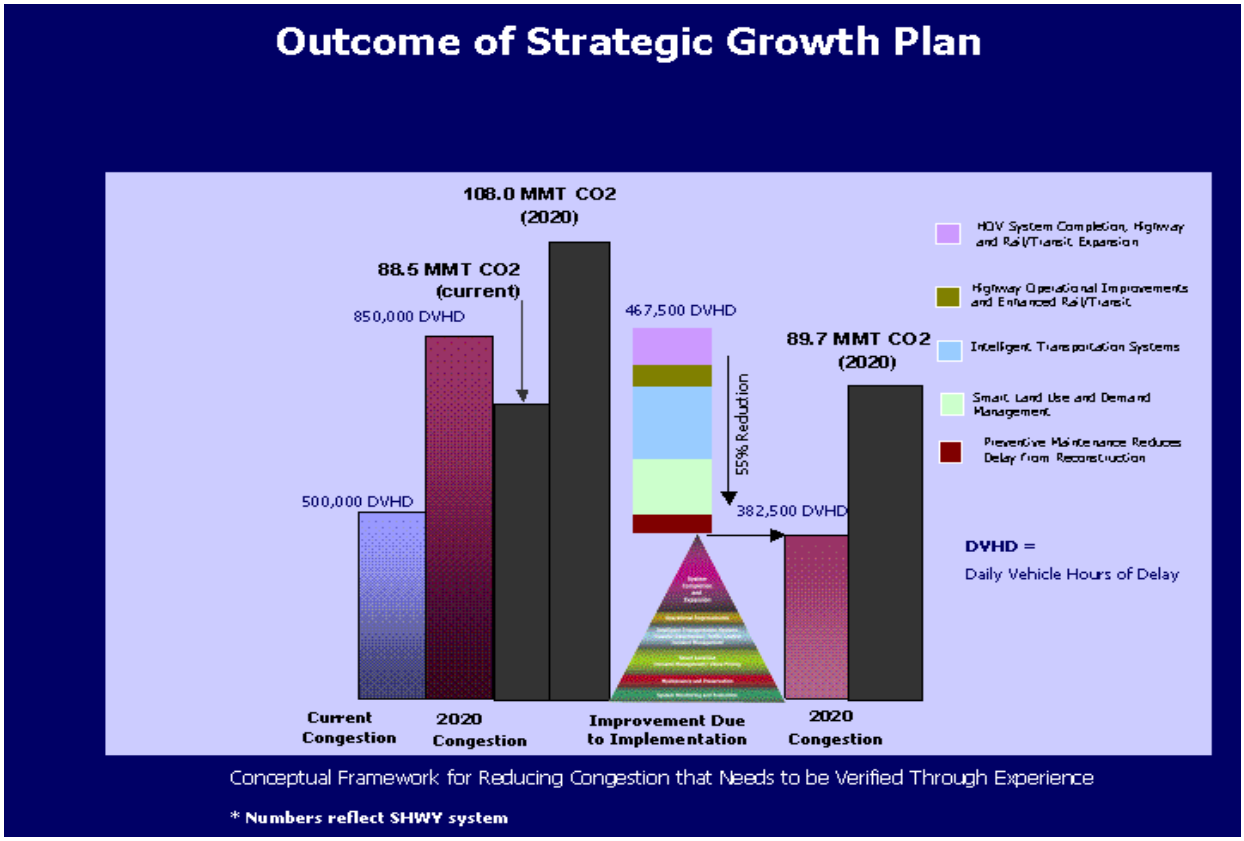


Figure 2-6: Outcome of Strategic Growth Plan

As part of the Climate Action Program at Caltrans (December 2006, http://www.dot.ca.gov/docs/ClimateReport.pdf), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and CARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the UC Davis.

Table 2.6.1-1 summarizes the Department and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006); it is available at http://www.dot.ca.gov/docs/ClimateReport.pdf.

Adaptation Strategies

"Adaptation strategies" refer to how the Department and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damaging roadbeds by longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects would vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

Climate change adaption must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, Governor Schwarzenegger signed Executive Order S-13-08 which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change.

The California Resources Agency [now the Natural Resources Agency, (Resources Agency)], through the interagency Climate Action Team, was directed to coordinate with local, regional, state and federal public and private entities to develop a state Climate Adaptation Strategy. The Climate Adaptation Strategy will summarize the best known science on climate change impacts to California, assess California's vulnerability to the identified impacts and then outline solutions that can be implemented within and across state agencies to promote resiliency.

As part of its development of the Climate Adaptation Strategy, Resources Agency was directed to request the National Academy of Science to prepare a *Sea Level Rise Assessment Report* by December 2010 to advise how California should plan for future sea level rise. The report is to include:

- relative sea level rise projections for California, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates;
- the range of uncertainty in selected sea level rise projections;
- a synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems;
- a discussion of future research needs regarding sea level rise for California.

Furthermore Executive Order S-13-08 directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system and economy of the state. The Department continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

Table 2.6-1: Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	The Department	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	The Department	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	The Department	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	The Department	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

Prior to the release of the final *Sea Level Rise Assessment Report*, all state agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects as of the date of Executive Order S-13-08 may, but are not required to, consider these planning guidelines. Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data. (Executive Order S-13-08 allows some exceptions to this planning requirement.) This project is not mandated to consider sea level rise because all program funding was programmed prior to 2013.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted as part of Governor's Schwarzenegger's Executive Order on Sea Level Rise and is mobilizing to be able to respond to the National Academy of Science report on *Sea Level Rise Assessment* which is due to be released by December 2010.

On August 3, 2009, Natural Resources Agency in cooperation and partnership with multiple state agencies, released the 2009 California Climate Adaptation Strategy Discussion Draft, which summarizes the best known science on climate change impacts in seven specific sectors and provides recommendations on how to manage against those threats. The release of the draft document set in motion a 45-day public comment period. Led by the California Natural Resources Agency, numerous other state agencies were involved in the creation of discussion draft, including Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The discussion draft focuses on sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. The strategy is in direct response to Gov. Schwarzenegger's November 2008 Executive Order S-13-08 that specifically asked the Natural Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings. A revised version of the report was posted on the Natural Resource Agency website on December 2, 2009; it can be viewed at: http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF.

Currently, the Department is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, the Department has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Department would be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise.

As shown on page 169 of the MTC 2011 TIP, all proposed project funding was programmed prior to 2013. The proposed project was not included in the 2007 TIP. As the proposed project was programmed for construction between the years 2008 and 2013, it is not necessary for the proposed project to consider a range of sea rise scenarios.

Chapter 3
Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation, the level of analysis required, and to identify potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for this proposed project have been accomplished through a variety of formal and informal methods, including: project development team meetings and interagency coordination meetings. This chapter summarizes the results of the Department's efforts to fully identify, address and resolve project-related issues through early and continuing coordination.

3.1 Public Agency Technical Meetings

Project Development Team (PDT) technical meetings have occurred regularly in conjunction with development of the I-80 ICM project. PDT participants include representatives from the Alameda County Transportation Commission (Alameda CTC) and The Department. The PDT represents various fields of expertise including design, environmental review, traffic operations, and project management.

3.2 Stakeholder Consultation

Project stakeholders are public agencies or other planning entities that provide input and direction to the project. Each stakeholder has varying roles in the planning, environmental clearance, permitting, and operation of the project. The stakeholders also have varying jurisdictional roles and responsibilities regarding funding, operations, and maintenance of the project. The I-80 ICM project stakeholders include the following agencies:

- The Alameda County Transportation Commission (Alameda CTC)
- The CEQA and NEPA Lead Agency (the Department)
- The Metropolitan Transportation Commission (MTC)
- County transportation planning entities [Contra Costa Transportation Authority (CCTA)[1] and Western Contra Costa Transportation Advisory Committee (WCCTAC)]
- Transit providers (AC Transit, WestCAT, BART, and Water Emergency Transportation Authority)
- Local agencies traversed by the I-80 freeway between Carquinez Bridge and San Francisco-Oakland Bay Bridge (Contra Costa County, and Cities of Oakland, Emeryville, Berkeley, Albany, El Cerrito, Richmond, Pinole, San Pablo and Hercules)

[1] Stakeholders included the CCTA and its sub-regional committee.

The planning for the I-80 ICM project has followed the FHWA Systems Engineering Process which includes monthly stakeholder meetings. The project's needs, alternatives, and solutions were developed during these monthly stakeholder meetings. The stakeholder meetings included the following technical committees/teams:

- Executive Advisory Committee: comprised of the Executive Directors of Alameda CTC, CCTA, MTC and the Department;
- Project Leadership Team: comprised of the Senior staff members of Alameda CTC, CCTA, WCCTAC, the Department, and MTC; and
- Technical Advisory Committee: comprised of the staff members for all participating agencies.

3.3 Native American Consultation

The following Native American Tribes, Groups, and Individuals have been contacted:

- Dave Singleton, Native American Heritage Commission February 3, 2009
- Jakki Kehl, Ohlone/Costanoan February 16, 2009
- Irene Zweierlein, Amah/Mutsun Tribal Band February 16, 2009
- Jean-Marie Feylin, Amah/Mutsun Tribal Band February 16, 2009
- Ann Marie Sayers, Indian Canyon Mutson Band of Costanoan February 16, 2009
- Rosemary Cambra, Muwekma Ohlone Indian Tribe of the SF San Francisco Bay Area February 16, 2009
- Katherine Erolinda Perez, Ohlone/Costanoan Northern Valley Yokuts Bay Miwok February 16, 2009
- Andrew Galvan, The Ohlone Indian Tribe February 16, 2009
- Ramona Garibay, Trina Marine Ruano Family February 16, 2009

Ms. Debbie Pilas-Treadway from the Native American Heritage Commission (NAHC) responded on February 10, 2009 indicating that a search failed to indicate the presence of cultural resources in the immediate project vicinity. She provided a list of eight tribal groups or individuals who might have knowledge of cultural resources in the vicinity of the proposed improvements. A response requesting updated information on the project was received via telephone on March 7, 2009 from Ms. Jakki Kehl, Ohlone/Coastanoan, speaking for herself and on behalf of Ms. Irene Zweierlein, Ohlone/Coastanoan.

3.4 US Fish and Wildlife Service Consultation

The following meetings, field visits, and consultation occurred with the US Fish and Wildlife servie (USFWS) with respect to federally listed species:

- USFWS Biologist, Jerry Roe, provided definitions of temporary and permanent effects regarding potential impacts to special-status species on August 10, 2010.
- USFWS Biologist, Jerry Roe, Coast-Bay Branch Endangered Species Division, met with the Department District 4 Biologist, Frances Malamud-Roam, and Trish Tatarian, Wildlife Research Associates, on August 9, 2010, to review the biological study area and discussed potential impact issues with regards to special-status species.

- The Department District 4 Biologist, Frances Malamud-Roam, requested technical assistance from USFWS, Coast-Bay Branch Endangered Species Division for review of the I-80 ICM proposed project on August 4, 2010.
- The Department District 4 Biologist, Frances Malamud-Roam, queried the USFWS list for federal endangered and threatened species that occur in or may be affected by projects within the five topographic quadrangles (Document No. 100730041646) on April 20, 2010.

A Biological Assessment (BA) has been prepared as part of the consultation process with the USFWS to determine whether the Build Alternative is likely to jeopardize the continued existence of threatened or endangered species or adversely affect critical habitat. Pursuant to CEQA and NEPA, the Department has proposed a number of reasonable and prudent measures to minimize and avoid impacts to threatened or endangered animal species. These measures are considered part of the project design and are described in detail in Chapter 1. As a result, the Build Alternative is not anticipated to result in the "take" of any of the listed species described in this section. The project effects are primarily temporary and discountable with the avoidance and minimization measures in place, and the permanent effects are insignificant and limited to very small discreet locations. The Department is currently seeking a letter of concurrence on this preliminary determination of the project's biological effects from the USFWS.

3.5 Required Permits

The Bay Conservation and Development Commission (BCDC), created prior to the California Coastal Act, retains oversight and planning responsibilities for development and conservation of coastal resources in the Bay Area. Portions of the Build Alternative would be within the BCDC jurisdiction (see Section 2.2.1). Implementation of the Build Alternative and associated construction activity within the coastal zone would require a coastal development permit from BCDC. In accordance with the BCDC permitting process, an application for the coastal permit shall occur after the certification of the environmental document and after all government agencies have granted their preliminary approvals (permits) for the project, as appropriate.

Temporary construction easements would be required from the City of Richmond and the City of Berkeley to accommodate work outside state-owned right-of-way.

3.6 Public Participation

3.6.1 Notice of Availability of the Draft Environmental Document

When the Draft IS/EA is ready for review, a Notice of Availability will be circulated to the project mailing list described in Section 3.6.1 and to the various parties listed in the Distribution List (see Chapter 5). The notice will provide information on the project, where the environmental document can be reviewed, the address to which comments should be sent, and the close of the comment period. The public notice and the IS/EA will be posted on the websites of Alameda CTC and the Department and copies of the IS/EA will be available at local libraries. The notification will also be posted in the local newspaper of general circulation.

3.6.2 Opportunity for a Public Hearing/Public Meeting

The public notice will include the opportunity to request a public hearing or meeting. This will also be included in the transmittal that accompanies each mailed copy of the draft environmental document.

3.6.3 Comments and Responding to Comments

This section will be completed after the public circulation of the IS/EA.

Chapter 4
List of Preparers

The following represents a list of those who contributed in the preparation of this document.

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Steve Fiedler, Noise Specialist
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Steve Arago, Landscape Architect
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Jenes Toledo, Administrative Assistant
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Ryan Dole, Engineer
Jack Meyer, Geoarchaeologist
Terry Klim, Transportation Planner
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Sheetal Bhatt, Engineer
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Jeff Tudd, Engineer
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Kalai Kubendran, Engineer
Aftab Loya, Engineer
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Chapter 5
Distribution List

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United States Senator
1700 Montgomery Street, Suite 240
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The Honorable Dianne Feinstein
United States Senator
One Post Street, Suite 2450
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Members of the U.S. House of Representatives

The Honorable George Miller
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3220 Blume Drive, Suite 160
Richmond, CA 94806

The Honorable Barbara Lee
United States Representative
9th District
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The Honorable John Garamendi
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Elected State Officials

Members of the State Senate

The Honorable Mark DeSaulnier
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The Honorable Loni Hancock
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Chapter 6
References

Association of Bay Area Governments. 2009. Projections 2009: What If?

Bay Area Air Quality Management District, 2010. Air Quality Standards and Attainment Status.http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, (accessed Nov. 5, 2010)

Bay Conservation and Development Commission. 2006. Summary of Tide Station Data/BCDC McAteer-Petris Act Jurisdiction.

Bennyhoff, James A. 1983 The Emeryville Site (CA-ALA-309) Viewed 93 Years Later, in *Symposium: A New Look at some Old Sites, Papers from the Symposium Organized by Francis A. Riddell, Presented at the Annual Meeting of the Society for California Archaeology, March 23-26, 1983, San Diego, California.* Coyote Press Archives of California Prehistory 6:65-74, 1986.

Cal-IPC. 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02.

California Department of Parks and Recreation. 2002. Eastshore State Park General Plan.

California Native Plant Society (CNPS). 2010. Inventory of Rare and Endangered Plants of California (online edition, v7-09a) California Native Plant Society. http://www.cnps.org/inventory

California Natural Diversity Database (CNDDB). 2010. Special-status species occurrences within the Oakland West, Mare Island and Richmond USGS 7.5-minute quadrangles. Wildlife and Habitat Data Analysis Branch, California Department of Fish and Game, Sacramento.

California Center for Innovative Transportation. 2009. Travel Times on Changeable Message Signs Volume II – Evaluation of Transit Signs.

California State Coastal Conservancy. 2003. Draft Programmatic Environmental Impact Statement/Environmental Impact Report. San Francisco Estuary Invasive Spartina Project : Spartina Control Program. Prepared for the California State Coastal Conservancy and the U.S. Fish and Wildlife Service.

City of Albany General Plan. 1992.

City of Berkeley General Plan. 2000.

City of Berkeley Land Use Planning Current Projects list dated October 1, 2010.

City of El Cerrito General Plan. 1999.

City of Emeryville General Plan. 1998.

City of Emeryville Status of Major Development Project dated September, 2010.

City of Hercules General Plan. 1998.

City of Hercules Project Map, updated April, 2010.

City of Oakland General Plan. 1998.

City of Pinole General Plan. 1995.

City of Pinole website. http://www.ci.pinole.ca.us/planning, (accessed November 1, 2010)

City of Richmond General Plan. 1994.

City of Richmond PLN Projects Under Review by Neighborhood Council, dated October 19, 2010 and http://www.ci.richmond.ca.us/index.aspx?NID=1404, (accessed November 1, 2010)

City of San Pablo General Plan. 1998.

City of San Pablo website www.ci.san-pablo.ca.us/main/currentprojects.htm, (accessed November 1, 2010)

Contra Costa County General Plan. 2005.

Contra Costa County website http://www.co.contra-costa.ca.us/index.aspx?nid=546 (accessed November 1, 2010) http://www.census.gov/, (accessed November 2, 2010)

Department. 2006. Traffic Noise Analysis Protocol.

Department. 2010a. Corridor System Management Plan.

Department. 2010b. Draft Project Report.

Department. 2010c Traffic Operations Analysis Report, I-80 Integrated Corridor Mobility.

Department. 2010d. Archaeological Survey Report for the I-80 Integrated Corridor Mobility Project.

Department. 2010e A Buried Archaeological Site Assessment and Archaeological Work Plan for Proposed Extended Phase I Subsurface Explorations for the I-80 Integrated Corridor Mobility Project.

Department. 2010f. Drainage Report, I-80 Integrated Corridor Mobility.

Department. 2010g. Location Hydraulic Study, I-80 Integrated Corridor Mobility.

Department. 2010h. Storm Water Data Report, I-80 Integrated Corridor Mobility.

Department. 2010i. Preliminary Geotechnical Report, I-80 Integrated Corridor Mobility Project

Department. 2010j. Hazardous Materials Technical Memorandum, I-80 Integrated Corridor Mobility.

Department. 2010k. Air Quality Technical Report, I-80 Integrated Corridor Mobility.

Department. 2010l. Noise Technical Memorandum, I-80 Integrated Corridor Mobility.

Department. 2011a. Visual Impact Assessment, I-80 Integrated Corridor Mobility.

Department. 2011b. Paleontological Identification Report for the I-80 Integrated Corridor Mobility Project.

Department. 2011c. Natural Environment Study, I-80 Integrated Corridor Mobility.

Federal Highway Administration. 1981. Visual Impact Assessment for Highway Projects.

Federal Highway Administration. 2006. Travel time reliability, making it there on time, all the time. Available at: http://ops.fhwa.dot.gov/publications/tt_reliability/brochure/ttr_brochure.pdf; Last accessed: March 30, 2011.

Federal Highway Administration. 2009. Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA. http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/100109guidmem.cfm, (accessed Nov. 5, 2009)

Freeway Management and Operations Handbook, FHWA, 2003. (revised 2006)

Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California. California Department of Fish and Game*, The Resources Agency. 156 pp.

Mercer Island Reporter. April 27, 2010. WSDOT adds electronic signs to manage lanes on regional interstate highways. Available at: http://www.pnwlocalnews.com/east_king/mir/news/92201899.html; Last accessed: March 30, 2011.

Metropolitan Transportation Commission, 2009. Final Environmental Impact Report for the Transportation 2035 Plan for the San Francisco Bay Area.

Schenk, W.E. 1926 *The Emeryville Shellmound: Final Report*. University of California Publications in American Archaeology and Ethnology. Berkeley.

Uhle, Max 1907 *The Emeryville Shellmound*. University of California Publications in American Archaeology and Ethnology. Berkeley.

University of California, Davis. 2010. California Roadkill Observation System, Road Ecology Center. Department of Environmental Science and Policy in the UC Davis College of Agricultural and Environmental Sciences.

U.S Census Bureau. Census Data 2000 website.

USEPA, 2010. Climate Change - What You Can Do. www.epa.gov/climatechange/wycd/road.html, (accessed 11/11/10)

U.S. Fish and Wildlife Service. 2010. Official Species list for the Benicia, Mare Island, Richmond and Oakland West 7.5-minute topographic quadrangles.

Wallace, William and Donald Lathrap. 1975. *West Berkeley (CA-Ala-307) A Culturally Stratified Shellmound on the East Shore of San Francisco Bay.* Contributions of the University California Archaeological Research Facility #2.