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 ROW, 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. Additional information on Environmental Justice is included in Chapter 3 in response to a comment received on the Draft IS/EA.

Growth

The project is an operational improvement project that 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: 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 avoid installation of system management facilities along the I-80 corridor proposed under the Build Alternative and therefore avoid ground disturbance within BCDC's jurisdiction associated with the Build Alternative.

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 "Maze" 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).[6]

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.[7] 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.

[6] 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.

[7] 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.[8] 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, under an incident condition (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%

[8] 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.

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 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.[9] 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.[10] 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"[11] 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.[12] 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.

[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.

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

[11] Platoons are defined as groups of vehicles traveling together in a dense formation.

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

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 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 ROW 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

Under the No Build Alternative the use of this already congested corridor would continue to increase and traffic congestion would worsen 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.

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 (FHWA) 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 basic steps in the process are:

1. Define the project setting and its viewshed.
2. Identify key views for visual assessment.
3. Analyze existing visual resources and viewer response.
4. Depict the visual appearance of project alternatives.
5. Assess the visual impacts of project alternatives.
6. Propose methods to avoid, minimize and/or mitigate adverse visual impacts. These measures can include enhanced plantings, texture or color coating for structures, contour grading, etc.

Detailed information about each step in the process can be found in *Visual Impact Assessment for Highway Projects*.

To analyze the visual effect of project alternatives, it is important to assess and gauge viewer response to the project alternatives. In this regard there are two primary viewer groups, those that view the proposed changes from the highway (motorists) and those with a view to the highway (predominately residents).

The first step in determining visual resource change is to assess the compatibility of the proposed project with the visual character of the existing landscape. The second step is to compare the visual quality of the existing resources with the projected visual quality after the project is constructed.

The viewer response to project changes is the sum of viewer exposure and viewer sensitivity to the project as determined in the preceding section. The resulting level of visual impact is determined by considering the severity of resource change together with the degree to which people are likely to oppose the change, especially on the grounds of its appearance.

To aid in the assessment of visual impacts, computer-generated visual simulations are used that depict the appearance of project alternatives in the view. Viewpoints that represent the viewer groups most affected and that are located in publically-accessible areas are selected for study.

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. Given that much of the project corridor is developed and lined by sound walls that limit views into the freeway corridor from areas immediately adjacent to the freeway, the viewer group most affected by the project alternatives would be motorists. Thus visual simulations prepared for this analysis focus on this viewer group.

Comments submitted during the public comment period raised concerns that views of the San Francisco Bay from residential areas near I-80 could be adversely affected by the project alternatives. In response to these comments the Department conducted additional analysis of effects to views from residential areas immediately east of I-80 in the City of Richmond. The assessment was conducted from publically-accessible roadways in the surrounding community.

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.

Off highway users, including residents and recreational users, are typically among the most sensitive to visual change – particularly when they have views of the highway that feature scenic resources. These viewers would likely have a negative response to changes on the highway that would substantially detract from or obstruct scenic views or resources. Other viewers such as

motorists are typically less sensitive to visual change. However, if a project would substantially detract from or obstruct scenic views or resources, a negative response from these viewer groups could also be expected. Employees would be among the least sensitive to visual change because they are typically focused on work activities during the day and thus would not be expected to have a negative response to changes to the highway.

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. **Figure 2-1** depicts the 20 viewpoints/view areas within the study 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 existing freeway signage, utility poles, and street lights represent visual clutter and decrease the overall visual quality experienced by motorists and surrounding residents and workers. In viewpoint/view areas 1-17, the existing visual quality is predominately low with few scenic resources or scenic views present. However, comments submitted during the public review period identified portions of residential areas to the east of I-80 in viewpoint/view areas 13 and 14 that have views of San Francisco Bay. As a result, the vividness rating for viewpoint/view areas 13 and 14 have been modified to include a Moderate rating for these residential views (see **Table 2.2-8**).

Viewpoints/View areas 18, 19, and 20 have substantially higher visual quality as shown in **Table 2.2-8** because there are uninterrupted views of San Francisco Bay within these areas. .

Table 2.2-8: Existing Visual Quality Summary

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

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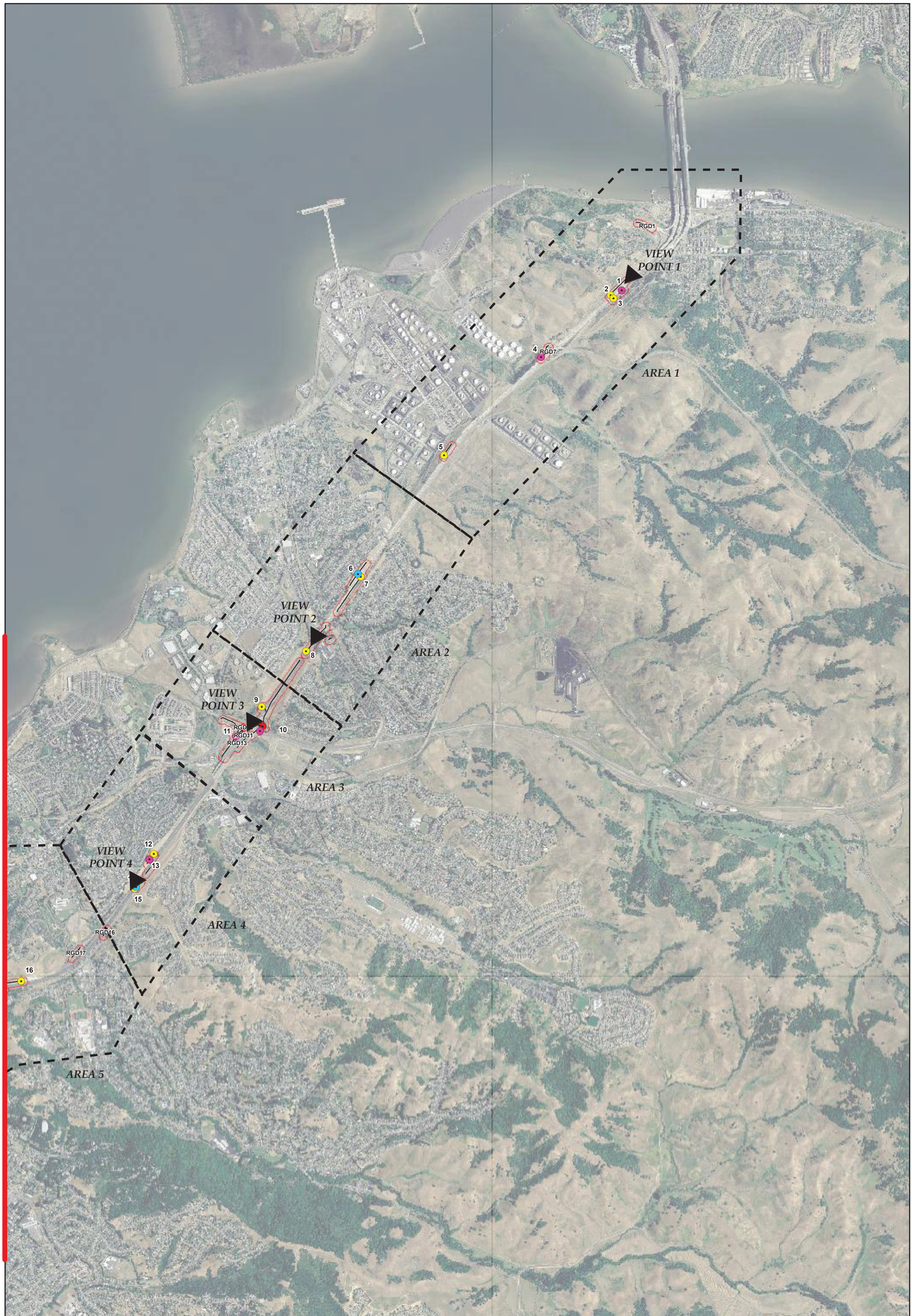

0 500 1,000 2,000 3,000 4,000 Feet

SOURCE: ©2004, Aerial Express Map

CHANGEABLE MESSAGE SIGN

ATM

VARIABLE ADVISORY SPEED SIGN

CCTV CAMERA

GROUND DISTURBANCE

VARIABLE MESSAGE SIGN

BIOLOGICAL STUDY AREA (100 FOOT RADIUS AROUND GROUND DISTURBANCE)

Figure 2-1
Sheet 1 of 3

Interstate 80 Integrated Corridor Mobility Project

VIEW POINT/VIEW AREAS

Figure 2-1, sheet 1 (back)

CHANGEABLE MESSAGE SIGN

ATM

VARIABLE ADVISORY SPEED SIGN

CCTV CAMERA

GROUND DISTURBANCE

VARIABLE MESSAGE SIGN

BIOLOGICAL STUDY AREA (100 FOOT RADIUS AROUND GROUND DISTURBANCE)

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

SOURCE: ©2004, Aerial Express Map

Figure 2-1
Sheet 2 of 3

Interstate 80 Integrated Corridor Mobility Project

VIEW POINT/VIEW AREAS

NOTE: Please refer to Appendix A for detailed device and ramp disturbance locations.

Figure 2-1, sheet 2 (back)

MATCHLINE FIGURE 2-1, Sheet 2

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

SOURCE: ©2004, Aerial Express Map

CHANGEABLE MESSAGE SIGN

ATM

VARIABLE ADVISORY SPEED SIGN

CCTV CAMERA

GROUND DISTURBANCE

VARIABLE MESSAGE SIGN

BIOLOGICAL STUDY AREA (100 FOOT RADIUS AROUND GROUND DISTURBANCE)

Figure 2-1
Sheet 3 of 3

Interstate 80 Integrated Corridor Mobility Project

VIEW POINT/VIEW AREAS

Figure 2-1, sheet 3 (back)

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 (IDBs) and gantry structures, would have an impact 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 IDBs with full color graphics would be inconsistent with the character of the freeway corridor within Contra Costa and Alameda counties.

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 few scenic resources in views of or from the I-80 corridor. 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 and would have little or no visual impact. Large components of the Build Alternative within viewpoints/view areas 1 through 17 would include four IDBs and eight gantries. The IDBs are located in the northerly portion of the project corridor, with one each in viewpoint/view area 2, 4, 7 and 12. The eight gantries are distributed along the highway in the cities of Richmond, El Cerrito and Berkeley in viewpoint/view areas 12 through 17. The large components (information display boards and gantries) would have more of a visual impact due to the size of these new features.

During the public review process the Richmond Annex Neighborhood Council (RANC) submitted comments indicating that residential areas to the east of I-80 in view areas 13 and 14 have views of San Francisco Bay that could be affected by the project alternatives. (Please see Chapter 3 for a copy of RANC's letter and the Department's response).

The Department conducted additional analysis of the effects to viewer groups in this area by assessing the impacts of Gantries #11, #10, and #9 on views of San Francisco Bay from publically-accessible streets in these residential areas. The Department determined that Gantry #11 would not affect views to San Francisco Bay since residential areas to the east of I-80 do not have direct views of the Bay because of a large sound wall that lines I-80 and the relatively flat topography of the area. However, the Department has determined that Gantry #11 should be moved approximately 150 feet north to align with an existing sign structure and a row of large trees along the freeway to reduce any potential visual concern. The trees would block views of the gantry.

The Department determined that Gantry #10 in its proposed location would not detract from or obstruct views of San Francisco Bay from publically-accessible view corridors in areas east of I-80, particularly down Tehama Avenue and Burlingame Avenue. Thus, no change to the location of Gantry #10 has been made.

The Department determined that Gantry #9 would be visible to residents along San Luis Street just north of Central Avenue. While the gantry structure would not be tall enough to obstruct views of San Francisco Bay, its presence could substantially detract from the view. As a result, the Department has relocated Gantry #9 650 feet to the south, which moves the structure out of the primary view corridor for these residents and places it in an area of predominately commercial/industrial development.

The Department met with RANC on June 16 and June 28, 2011 to discuss their comments, the Department's analysis of the visual effects, and the proposed relocation of Gantries #11 and #9. RANC concurred with the Department's determination of visual effects and relocation of Gantries #11 and #9 and indicated that their concerns about visual effects have been addressed.

The four IBDs and other five gantries not discussed above that would be in viewpoints/view areas 1through 17 are located in areas with low visual quality that are dominated by high sound walls and/or other visual clutter. They would not detract from nor block significant views or visual features.

With the changes described above for Gantries #11 and #9, the Build Alternative would not substantially degrade the existing visual character or visual quality of viewpoint/view areas 1 through 17, or introduce substantial new sources of light or glare.

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 an appreciable change to the visual quality of the area. The project 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 a substantial 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 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 substantial new source of light during night time hours.

Eastbound motorists would not readily see Gantry #2 since it would be behind the Ashby Avenue interchange bridge. While Gantry #2 would result in some change to the visual intactness of viewpoint/view area 19, the visual impact would not be substantial since views of San Francisco Bay would not be affected.

Information Display Board (IDB) #1 (eastbound)

As shown in **Figure 2-1I**, IDB #1 would be placed near the existing Powell Street undercrossing. In viewpoint/view area 20, IDB #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**, IDB #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. IDB #1 would not result in a substantial 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. It would be readily visible to both westbound and eastbound I-80 motorists, but would not interfere with views of the San Francisco Bay. Also, it would not result in a substantial new source 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 a substantial 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 not install the system management facilities along the I-80 corridor proposed under the Build Alternative and thus would avoid the visual effects associated with these facilities.

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

The Department incorporates various design features to reduce or avoid adverse visual effects. In this case, for example, Variable Advisory Speed Signs (VASS) and IDB signs will include louvers, which reduce the potential for light and glare effects to nearby adjacent land uses. Also, the locations of some project features were adjusted so they would not appear directly within scenic views.

As identified in Section 2.2.3.2 above, the visual environment of the freeway includes visual clutter from existing signs, utility poles and lighting. To reduce visual clutter, the Department will conduct an inventory of the highway corridor and will determine if any signs, poles, and other vertical structures could be eliminated. Items found to be redundant or no longer needed will be removed, thereby reducing visual clutter.

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 "built environment" resources (structures, bridges, railroads, water conveyance systems, etc.), culturally important resources, and archaeological resources (both prehistoric and historic) regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act 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, the Federal Highway Administration (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 ROW.

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[13] 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 avoid installation of system management facilities along the I-80 corridor proposed under the Build Alternative and therefore avoid the minor ground disturbance associated with the Build Alternative.

[13]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, including archeological resources, are discovered during construction, the construction contractor(s) would: (1) inform all field personnel of this possibility; (2) halt excavation immediately within at least 10 meters of a potential archeological find; (3) promptly notify the Department's archeologist of the find; and (4) allow for a qualified professional archeologist to examine and evaluate the find to determine whether or not further treatment is warranted.

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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