Appendix C Resources Evaluated Relative to the Requirements of Section 4(f)

This section of the document discusses parks, recreational facilities, wildlife refuges and historic properties found within or next to the project area that do not trigger Section 4(f) protection because either: 1) they are not publicly owned, 2) they are not open to the public, 3) they are not eligible historic properties, 4) the project does not permanently use the property and does not hinder the preservation of the property, or 5) the proximity impacts do not result in constructive use.

Three publicly owned parks are near or adjacent to the project corridor:

- Dublin Sports Complex, Dublin
- Park just north of Saddleback Circle, Livermore
- Northfront Park, Livermore

The project would not "use" any portion of the above park properties under Section 4(f), meaning that these parks would not be acquired, be occupied, or negatively impacted for the purposes of this project (23 CFR 774.17).

A "constructive use" can occur when a project substantially impairs the activities, features, or attributes that qualify the resources for protection under Section 4(f). Although this project does not directly "use" any of the above listed properties, it is possible that there could be a "constructive use" if noise generated by the project impaired park activities, features, or attributes. As part of the Noise Study Report for the project, each park was evaluated for existing noise levels and potential noise impacts from the project. The following summarizes the results of the study with respect to each park (23 CFR 774.15).

- Dublin Sports Complex, Dublin. Three locations in the park were analyzed for existing and future noise levels (R15 through R17; shown in Appendix A, Sheets 3 and 4). In all three locations, the existing, future without-project, and future with-project noise levels would be the same (70 to 78 dBA; see Table 2.2.4-3, "Foothill Blvd./San Ramon to Santa Rita Rd. Segment").
- Park just north of Saddleback Circle, Livermore. One location in the park was analyzed for existing and future noise levels (R27; shown in Appendix A, Sheet 15). The existing, future without-project, and future with-project noise level would be the same (65 dBA). In addition, this location will receive shielding from a 12-foot-high, approximately 1,900-foot-long noise barrier that will be built in early to mid 2014 between East Airway Boulevard and Portola Avenue by Phase III of the I-580 Eastbound HOV Lane Project (04-2908U1).
- Northfront Park, Livermore. One location in the park was analyzed for existing and future noise levels (R60; shown in Appendix A, Sheet 22). The existing, future without-project, and future with-project noise level would be the same (76 dBA; see Table 2.2.4-3, "First St. to Greenville Rd. Segment").

FHWA has determined that a "constructive use" does not occur when:

- The projected traffic noise levels of a proposed highway project do not exceed the FHWA noise abatement criteria (NAC) as contained in Table 1 of 23 CFR 772 and in Table 2.2.4-1 of this report; or
- The projected noise levels exceed the relevant threshold in the above in paragraph because of existing noise levels, but the increase of the projected noise levels under the with-project conditions would be barely perceptible (less than 3 dBA) compared to the projected noise levels under the no-project conditions.

The noise levels at the Dublin Sports Complex and Northfront Park already approach or exceed the NAC as defined by 23 CFR 772 (67 dBA for Section 4(f) facilities). The project would not increase noise levels; therefore, the project would not qualify as a constructive use of these parks.

With or without the project, the park just north of Saddleback Circle would have a future noise level that does not approach or exceed the NAC as defined by 23 CFR 772 (67 dBA for Section 4(f) facilities). Therefore, the project would not qualify as a constructive use of this park.

The proposed project would not cause a constructive use of Dublin Sports Complex, the park just north of Saddleback Circle, or Northfront Park because the proximity impacts will not substantially impair the protected activities, features, or attributes of these parks.

No other facilities, functions, and/or other activities would be potentially affected. Therefore, the provisions of Section 4(f) are not triggered.

Appendix D Consultation and Coordination

This appendix includes the following consultation and correspondence regarding the proposed project.

- **Part D1: Qualitative $PM_{2.5}$ Hot Spot Analysis**
  - **Memorandum to Metropolitan Transportation Commission regarding updates to the I-580 Eastbound Express Lanes Project with respect to the Qualitative $PM_{2.5}$ Hot Spot Analysis (November 19, 2013).** This memorandum was prepared to notify the Bay Area Air Quality Conformity Task Force of project design changes and other updates that have occurred since approval of the Qualitative $PM_{2.5}$ Hot Spot Analysis in July 2011. The changes do not affect the findings of the analysis.
  - **Qualitative PM2.5 Hot Spot Analysis, I-580 Eastbound Express Lanes Project, Alameda County, California.** This analysis was prepared to document potential project effects on $PM_{2.5}$ emissions. The Air Quality Conformity Task Force reviewed the methods, assumptions, and analysis used in the hot spot analysis and on July 28, 2011, determined that the project is not anticipated to result in future or worsened violations of $PM_{2.5}$ standards.

- **Part D2: Biological Conservation Measures**
  - **Amended United States Fish and Wildlife Service Biological Opinion for the I-580 Eastbound HOV Lane Project (USFWS File No. 81420-2008-F-0495-R001-3, October 26, 2011).** Project construction activities would be covered under the Section 7 process completed for the I-580 Eastbound HOV Lanes Project phases, as described in Section 2.3.
  - **Amended United States Fish and Wildlife Service Biological Opinion for the I-580 Eastbound HOV Lane Project (USFWS File No. 81420-2008-F-0495-R002-1, July 2, 2012).** Project construction activities would be covered under the Section 7 process completed for the I-580 Eastbound HOV Lanes Project phases, as described in Section 2.3.
  - **No Effect Determination for the I-580 Eastbound Express Lanes Project (July 5, 2013).** This memorandum documents that with implementation of specified measures, the proposed project will have no impacts on biological resources, as described in Section 2.3.

- **Part D3: Federal Highway Administration Project-Level Conformity Determination (March 12, 2014).** Air quality studies were submitted for FHWA concurrence on February 11, 2014.

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Part D1: Qualitative $PM_{2.5}$ Hot Spot Analysis

- **Memorandum to Metropolitan Transportation Commission regarding updates to the I-580 Eastbound Express Lanes Project with respect to the Qualitative PM2.5 Hot Spot Analysis (November 19, 2013)**

- **Qualitative PM2.5 Hot Spot Analysis, I-580 Eastbound Express Lanes Project, Alameda County, California**

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URS

Memorandum

Date: November 19, 2013

To: Harold Brazil, Planning, Metropolitan Transportation Commission

From: Gary Sidhu, Project Manager, Alameda County Transportation Commission, and Lynn McIntyre, Project Manager/Environmental, URS

Subject: ***TIP ID ALA070020 (FMS ID: 187.00), I-580 Eastbound Express Lanes Project, Alameda County, CA***

The purpose of this memorandum is to inform the Air Quality Conformity Task Force of updates to the I-580 Eastbound Express Lanes Project, in advance of the public release of the project's NEPA document in early January 2014.

The Alameda County Transportation Commission (Alameda CTC) initiated consultation with the Task Force regarding the project's potential to be a Project of Air Quality Concern (POAQC) in May 2011. The project was identified as a POAQC, and in July 2011, the project team provided the Task Force with a qualitative $PM_{2.5}$ hot-spot analysis to document potential project effects on $PM_{2.5}$ emissions. The Task Force reviewed the methods, assumptions, and analysis used in the hot-spot analysis and on July 28, 2011, determined that the project is not anticipated to result in future or worsened violations of $PM_{2.5}$ standards (see **Attachment A**).

After Task Force consultation, the project limit was shifted by 0.8 mile to the west (from west of the Hacienda Drive interchange [PM 19.1] to west of the Hopyard Road/Dougherty Road overcrossing [PM 19.9]) to accommodate advance notification signs for the express lane facility. The project will not add or lengthen HOV/express lanes or auxiliary lanes or change capacity in any way within that 0.8 mile segment. Alameda CTC informed the Task Force of this project change and on November 16, 2011, received concurrence from the Task Force that the change does not alter the conformity analysis (see **Attachment B**). The original and revised project limits are shown in Figure 1.

The NEPA document for the project, including the $PM_{2.5}$ hot-spot analysis, was to be released for public review in summer 2012. However, the document was held until recently, pending resolution of Caltrans design exception issues. During that time, the access configuration for the express lanes was changed from "controlled access" with intermediate ingress/egress points (in which traffic can only enter and exit the lanes in specific locations indicated by openings in buffer striping) to "open access" (in which traffic can enter and exit the lanes at any location). This change was made so that the I-580 express lanes would be consistent with other express lane facilities planned by the MTC in the Bay Area.

The change in access configuration does not add to the length of the project, the number of proposed lanes, or the overall capacity of eastbound I-580. The length and number of HOV/express lanes are consistent with those analyzed in the 2011 hot-spot analysis.

For purposes of the NEPA document, some updates have been incorporated to the project's technical analyses. Additional traffic data have been developed using updated assumptions approved by Caltrans to assess traffic conditions with the open access configuration. The additional traffic data show that the project will improve opening year and horizon year peak hour levels of service, speeds, and delay times compared with No Build, consistent with the original traffic data. In addition, the project's 2011 Air Quality Impact Assessment and Mobile Source Air Toxics report have been updated using the current

modeling requirements (including EMFAC2011 and CT-EMFAC5), additional traffic data, current trend data for the nearest monitoring station, and references to the 2013 Regional Transportation Plan and 2013 Transportation Improvement Program.

These updates do not materially affect the project as presented and analyzed in the 2011 hot-spot analysis. The $PM_{2.5}$ analysis process is considered complete, and the 2011 hot-spot analysis is considered valid until approximately mid-2014 provided there are no project design changes that would increase capacity.

Alameda CTC proposes to incorporate the following changes to the 2011 hot-spot analysis either directly or by reference, to address specific outdated information before the analysis is made available for public review as part of the NEPA document. Otherwise, the inclusion of this information may result in confusion to the public and to agency reviewers. These updates do not change the conclusions of the 2011 hot-spot analysis.

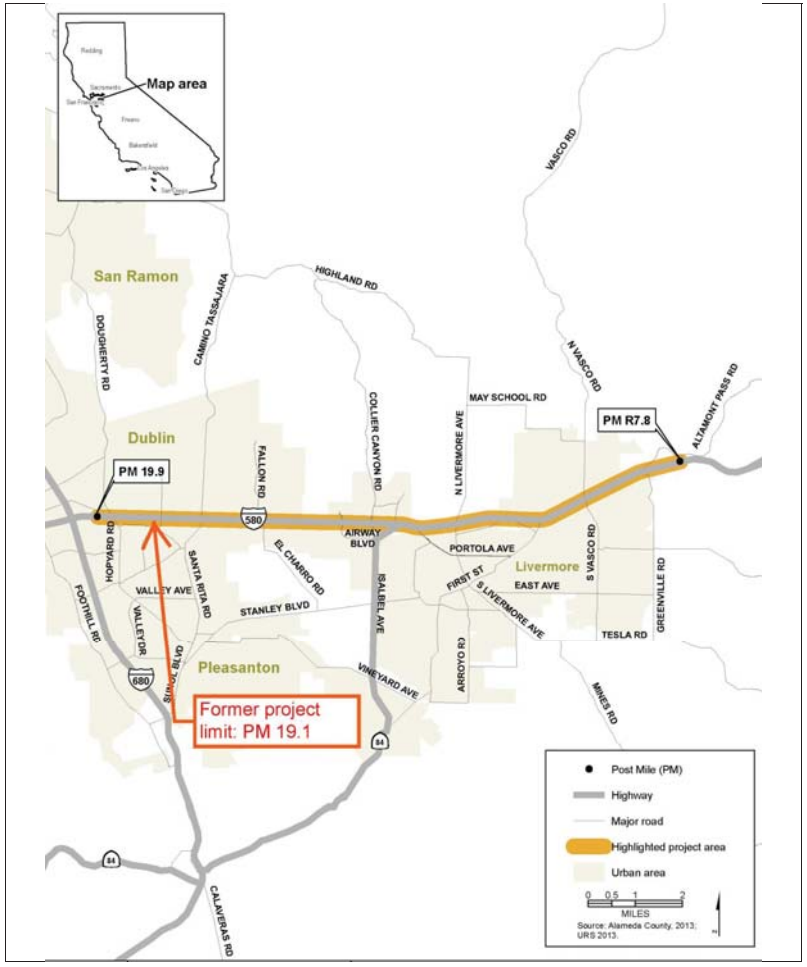
The revisions are as follows:

- Update the project's Caltrans EA number.
- Update the project description with current express lane access configuration and project limits, and remove Figure 1-2, which shows the controlled access configuration that is no longer applicable.
- Update the RTP number, which has changed.
- Remove references to Phase III of the I-580 Eastbound HOV Lane Project, also known as the I-580 Eastbound Auxiliary Lane Project (EA 04-2908U1). The Phase III/Auxiliary Lane Project and the I-580 Eastbound Express Lanes Project were included as a single action in the MTC's 2011 TIP (ID ALA070020). The two projects have undergone separate environmental review but were addressed together as a single action in the 2011 hot-spot analysis for the I-580 Eastbound Express Lanes Project. For the Phase III/Auxiliary Lane Project, public review of the hot-spot analysis was completed as part of NEPA clearance in early November 2011, the FHWA issued a conformity determination on November 23, 2011 (see **Attachment C**), and the project is currently in construction.

If there are any questions or comments about these changes, please contact Lynn McIntyre, URS, at 510.874.3149.

URS

Figure 1. Current and Former Project Limits



URS

Attachment A
Notice of Completion of Initial Consultation

From: "fms@mtc.ca.gov" <fms@mtc.ca.gov>
Date: August 9, 2011 3:10:32 AM GMT+03:00
To: Ray Akkawi <RAkkawi@alamedactc.org>

Subject: FMS POAQC Update to Project TIP ID ALA070020 (FMS ID: 187.00)

Dear Project Sponsor

On Thursday, July 5, 2011, the Air Quality Conformity Task Force reviewed your PM2.5 Hot-Spot Analysis completed for TIP ID ALA070020 (FMS ID: 187.00). As of this date, all the interagency consultation requirements of PM2.5 project level conformity have been completed. As the project sponsor, you are receiving this email notifying you may proceed forward with obtaining federal approvals for the PM2.5 Hot-Spot Analysis. Please save this email as documentation of completing the consultation process for PM2.5 project level conformity.

If there are any questions regarding the status of the project, please direct them to Grace Cho of MTC by email at gcho@mtc.ca.gov or by phone at (510) 817-5826.

Thank you.

URS

Attachment B
Memorandum Regarding Change in Project Limits

METROPOLITAN
TRANSPORTATION
COMMISSION

Joseph P. Bort MetroCenter
101 Eighth Street
Oakland, CA 94607-4700
TEL 510.817.5700
TDD/TTY 510.817.5769
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E-MAIL info@mtc.ca.gov
WEB www.mtc.ca.gov

Memorandum

TO: Air Quality Conformity Task Force DATE: November 16, 2011

FR: Adam Crenshaw W. I.

RE: Proposed 2011 TIP Amendment 11-19: I-580 Corridor – East Bound HOV/HOT Lanes Project (ALA070020)

The Alameda County Transportation Commission has recently submitted a request to update one of the post-mile limits for the I-580 Corridor – Eastbound HOV/HOT Lanes project (TIP ID: ALA070020) from post-mile 19.1 to 19.9. This update will allow for the placement of advance notice signs for the new HOV/HOT facility. MTC Staff is planning to include this change in Amendment 11-19 to MTC's 2011 TIP, scheduled to go before the Commission on January 25, 2012.

Staff is currently seeking the Task Force's concurrence that this change will not alter the conformity analysis performed on the 2011 TIP and Transportation 2035 Plan as the project limits are being expanded to allow for the inclusion of exempt elements.

Background

The I-580 Corridor – Eastbound HOV/HOT Lanes project was originally amended into the TIP as a non-exempt project during the development of the 2007 TIP. In April 2009, the project description was updated to change the western limit of the project from "west of Santa Rita Road" to "Hacienda Road" with the eastern limit remaining at Greenville Rd. After the adoption of MTC's Transportation 2035 Plan, this project relied on the air quality analysis conducted on RTP ID 21116 for its air quality conformity determination. The limits of this project as described in the RTP match those of the current TIP listing. However, these limits are for the widening of I-580 only and do not include the portion of I-580 where the advanced notification signs will be placed to warn drivers of the upcoming HOV/HOT lane facility.

Proposed Revision

The proposed amendment to the 2011 TIP, will update the location information on the I - 580 Corridor – Eastbound HOV/HOT Lanes project (TIP ID: ALA070020) to reflect the post-mile limit of 19.9, instead of 19.1 as it is currently shown. The limits of the actual widening of I-580 will remain "from east of Greenville Rd. to Hacienda Dr." and the additional 0.8 miles will be used only for the addition of advanced notification signs. Given that the placement of directional and informational signs is an exempt activity under the "Other" category of 40 CFR 93.126, the proposed amendment will not alter the conformity analysis performed on the 2011 TIP and Transportation 2035 Plan.

URS

Attachment C
FHWA Conformity Determination for I-580 Eastbound Auxiliary Lane Project
(addressed in 2011 Hot-Spot Analysis for I-580 Eastbound Express Lanes Project)

U.S. Department of Transportation
Federal Highway Administration

California Division

650 Capitol Mall, Suite 4-100
Sacramento, CA 95814
(916) 498-5001

November 23, 2011

In Reply Refer To:
HDA-CA
EA 2908100

Bijan Sartipi, District Director
California Department of Transportation
111 Grand Avenue
P.O. Box 23360
Oakland, CA 94612

Attention: Allen Baradar, Office Chief, Chief of Environmental Engineering

Dear Mr. Baradar:

SUBJECT: FHWA Project Level Conformity Determination for the I-580 Eastbound Auxiliary Lane Project

On November 10, 2011, the California Department of Transportation (Caltrans) submitted to the Federal Highway Administration (FHWA) a request for a project level conformity determination for the I-580 Eastbound Auxiliary Lane Project in Alameda County. The project is in an area that is designated Nonattainment for $PM_{2.5}$ and Ozone and Maintenance for Carbon Monoxide (CO).

The project level conformity analysis submitted by Caltrans indicates that the transportation conformity requirements of 40 C.F.R. Part 93 have been met. The project is included in the Metropolitan Transportation Commission's (MTC) currently conforming *Transportation 2035 Plan (RTP)* and the *2011 Regional Transportation Improvement Program (FTIP).* The current conformity determinations for the RTP and FTIP were approved by FHWA and the Federal Transit Administration (FTA) on December 14, 2010. The design concept and scope of the preferred alternative have not changed significantly from those assumed in the regional emissions analysis.

As required by 40 C.F.R. 93.116 and 93.123, the localized CO and $PM_{2.5}$ analyses are included in the documentation. The CO hotspot analysis was conducted using the *Transportation Project-Level Carbon Monoxide Protocol.* The analyses demonstrate that the project will not create any new violation of the standards or increase the severity or number of existing violations.

Based on the information provided, FHWA finds that the Conformity Determination for the I-580 Eastbound Auxiliary Lane Project in Alameda County conforms to the State Implementation Plan (SIP) in accordance with 40 C.F.R. Part 93.

If you have any questions pertaining to this conformity finding, please contact Stew Sonnenberg, FHWA Air Quality Specialist, at (916) 498-5889.

Sincerely,

For
Vincent P. Mammano
Division Administrator

QUALITATIVE $PM_{2.5}$ HOT SPOT ANALYSIS

I-580 EASTBOUND EXPRESS LANES PROJECT, ALAMEDA COUNTY, CALIFORNIA

EA 04-0G1900
04-ALA-580 PM R7.8-19.9

Prepared for

Alameda County Transportation Commission
1333 Broadway #220
Oakland, CA 94612

August 10, 2011
Revised December 2013

URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612

PREFACE

Specific revisions have been incorporated into the August 2011 *Qualitative $PM_{2.5}$ Hot Spot Analysis* to reflect updates to the I-580 Express Lanes Project that took place after the analysis was completed. These revisions were presented and discussed at the Bay Area Air Quality Conformity Task Force meeting at the Metropolitan Transportation Commission (MTC) on December 5, 2013, and are also described in the *Memorandum to Metropolitan Transportation Commission regarding updates to the I-580 Eastbound Express Lanes Project with respect to the Qualitative $PM_{2.5}$ Hot Spot Analysis* (November 19, 2013; see beginning of Appendix C, Part C1). The revisions do not change the conclusions of the 2011 hot spot analysis.

The revisions are described below and are also shown in the *Qualitative $PM_{2.5}$ Hot Spot Analysis* with a vertical line to the right of the revised text.

- On the front cover, the project's Caltrans EA number has been updated from 04-0G190K to 04-0G1900.
- On the front cover, the post mile (PM) limits have been changed from PM 19.1 to PM 19.9. The reason for this change is that after Task Force consultation in July 2011, the project limit was shifted by 0.8 mile to the west (from west of the Hacienda Drive interchange [PM 19.1] to west of the Hopyard Road/Dougherty Road overcrossing [PM 19.9]) to accommodate advance notification signs for the express lane facility. The project will not add or lengthen HOV/express lanes or auxiliary lanes or change capacity in any way within that 0.8 mile segment. Alameda CTC informed the Task Force of this project change and on November 16, 2011, received concurrence from the Task Force that the change does not alter the conformity analysis (see Attachment B of the *Memorandum to Metropolitan Transportation Commission regarding updates to the I-580 Eastbound Express Lanes Project with respect to the Qualitative $PM_{2.5}$ Hot Spot Analysis* at the beginning of Appendix C, Part C1).
- In Section 1, a footnote has been added to provide the most current citations to the Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP).
- In Section 2, the project description has been updated with the current express lane access configuration and project limits. The reason for this change is that after Task Force consultation in July 2011, the access configuration for the express lanes was changed from "controlled access" with intermediate ingress/egress points (in which traffic can only enter and exit the lanes in specific locations indicated by openings in buffer striping) to "open access" (in which traffic can enter and exit the lanes at any location). This change was made so that the I-580 express lanes would be consistent with other express lane facilities planned by the MTC in the Bay Area. The change in access configuration does not add to the length of the project, the number of proposed lanes, or the overall capacity of eastbound I-580. The length and number of HOV/express lanes are consistent with those analyzed in the 2011 hot spot analysis. Figure 1-1 has been updated, and Figure 1-2, which showed the controlled access configuration that is no longer applicable, has been removed.
- In Sections 2.2 and 3.2.2.4, discussions of Phase III of the I-580 Eastbound HOV Lane Project, also known as the I-580 Eastbound Auxiliary Lane Project (EA 04-2908U1), have been removed. The reason for this change is that the conformity analysis for the Phase III/Auxiliary Lane Project has been completed. The Phase III/Auxiliary Lane Project and the I-580 Eastbound Express Lanes Project were originally included as a

PREFACE

single action in the MTC's 2011 TIP (ID ALA070020). The two projects have undergone separate environmental review but were addressed together as a single action in the 2011 hot spot analysis for the I-580 Eastbound Express Lanes Project. For the Phase III/Auxiliary Lane Project, public review of the hot spot analysis was completed as part of NEPA clearance in early November 2011, the FHWA issued a conformity determination on November 23, 2011 (see Attachment C of the *Memorandum to Metropolitan Transportation Commission regarding updates to the I-580 Eastbound Express Lanes Project with respect to the Qualitative $PM_{2.5}$ Hot Spot Analysis*), and the project is currently in construction.

These updates do not materially affect the project as presented and analyzed in the 2011 hot spot analysis.

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Attachments

A Mainline Levels of Service

Acronyms and Abbreviations

AADT	Annual average daily traffic
BAAQMD	Bay Area Air Quality Management District
BATA	Bay Area Toll Authority
CAA	Clean Air Act
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
Department	California Department of Transportation
EMFAC	Emission Factor Model
EPA	United States Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HOV	High-occupancy vehicle
I-580	Interstate 580
LOS	Level of service
$\mu g/m^3$	Microgram per cubic meter
mph	Miles per hour
MTC	Metropolitan Transportation Commission
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_x	Nitrogen oxides
O_3	Ozone

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PM	Particulate matter
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to 10 microns
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
POAQC	Project of Air Quality Concern
project	Interstate 580 Eastbound Express Lanes Project
RTP	Regional Transportation Plan
SFBAAB	San Francisco Bay Area Basin
SIP	State Implementation Plan
SO_x	Sulfur oxides
TIP	Transportation Improvement Program
USC	United States Code

SECTION ONE Introduction

This project-level hot spot analysis for the I-580 Eastbound Express Lanes Project responds to the United States Environmental Protection Agency's (EPA) requirement for a hot spot analysis for particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), as required in the EPA's March 10, 2006, Final Transportation Conformity Rule (71 FR 12468). The effects of localized $PM_{2.5}$ hot spots were evaluated using the EPA and Federal Highway Administration (FHWA) guidance manual, *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (FHWA and EPA 2006).

This $PM_{2.5}$ analysis addresses the construction of the proposed project, which is included in the Metropolitan Transportation Commission's (MTC) current Regional Transportation Plan (RTP), the *Transportation 2035 Plan for the San Francisco Bay Area* (MTC 2009, RTP ID No. 230666 and No. 2030667). The FHWA made the conformity determination for the RTP on May 29, 2009. The project is also included in the 2011 Transportation Improvement Program (TIP), which was adopted by MTC on October 27, 2010 (TIP ID No. ALA-070020).[1]

[1] The project is also listed in *Plan Bay Area* (ABAG and MTC 2013, RTP ID 240050), for which FHWA and FTA made a regional conformity determination on August 12, 2013, and the 2013 Transportation Improvement Program (MTC 2013, page S3-100, TIP ID ALA070020).

SECTION TWO Project Description

The California Department of Transportation (Department), in cooperation with the Alameda County Transportation Commission (Alameda CTC), proposes to convert the existing Interstate 580 (I-580) eastbound high-occupancy vehicle (HOV) lane to an express lane facility. The conversion would allow single-occupant vehicles (SOVs) to pay a toll to use the lanes. HOVs would continue to use the lanes for free. The I-580 Eastbound Express Lanes Project (project) limits extend from just west of the Hopyard Road/Dougherty Road overcrossing to just east of the Greenville Road undercrossing in the cities of Dublin, Pleasanton, and Livermore in Alameda County. The total length of the project is approximately 12.1 miles. Figure 1-1 shows the project vicinity.

The project would not require any acquisition of right-of-way. The existing HOV lane would be converted to an express lane facility by eliminating the existing striping, delineating travel lanes, and restriping the roadway. Signs, toll structures, lighting, and utility equipment would be installed.

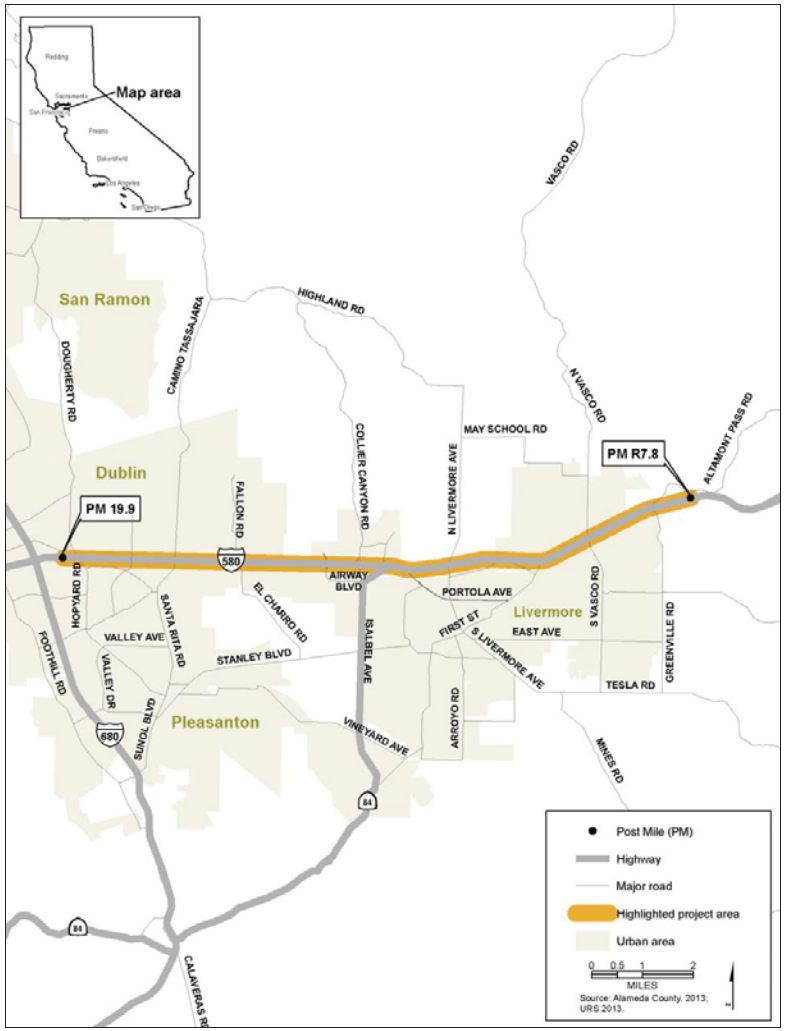
A single Build Alternative is being considered and would include the project components listed below.

2.1 EXPRESS LANES

Eastbound I-580 in the project limits has four general purpose lanes (lanes that are open to all vehicles) and one HOV lane. Construction of the HOV lane has taken place in three phases, collectively known as the I-580 Eastbound HOV Lane Project (Department 2007a, 2008a, 2009a, 2011a):

- Phase I (EA 04-290844) opened to traffic in October 2009. The improvements included mainline widening and ramp modifications to allow the addition of an eastbound HOV lane between Portola Avenue and Greenville Road. The widening included an additional 8 feet to accommodate the planned conversion of the HOV lane to an express lane.
- Phase II (EA 04-290834) opened to traffic in November 2010. The improvements included mainline widening and ramp modifications to allow the addition of an eastbound HOV lane between Hacienda Drive and Portola Avenue. As with Phase I, the widening included an additional 8 feet to accommodate the conversion of the HOV lane to an express lane.
- Phase III (EA 04-2908U1) will construct auxiliary lanes (lanes that extend from on-ramps to off-ramps) on eastbound I-580 between the Isabel Avenue interchange and the North Livermore Avenue interchange, and between the North Livermore Avenue interchange and the North First Street interchange. Phase III will also widen the freeway segments within the auxiliary lane limits, at the Hacienda Drive on-ramp to eastbound I-580, and between the Santa Rita Road and Fallon Road interchanges to accommodate the express lanes. Construction of Phase III is in progress and is anticipated to be completed in late 2014.

Figure 1-1. Project Vicinity



2.1.1 Express Lane Configuration

The Build Alternative would convert the existing HOV lane on eastbound I-580 from just west of the Hacienda Drive interchange to just west of the Greenville Road undercrossing to an express lane. A second express lane would be provided from the Fallon Road/El Charro Road interchange to the North First Street interchange, for approximately 6 miles of the 12.1-mile project corridor. Advance notification signs for the express lanes would be placed in the project limits starting west of the Hopyard Road/Dougherty Road overcrossing.

In all but one location, the express lanes would have an "open access" configuration, meaning that they would be separated from the general purpose lanes by an 8-inch white dashed line to allow traffic to enter and exit anywhere along the corridor. In the segment from Hacienda Drive to El Charro Road/Fallon Road, the express lane would be separated from the general purpose lanes with a 2-foot to 4-foot buffer zone delineated by double solid white striped lines. A buffer separation is proposed in this area to limit vehicle weaving at the beginning of the express lane facility.

2.1.2 Express Lane Tolling Facilities and Operations

The project would use a combination of signs, electronic toll collection equipment, and a traffic monitoring system to operate the express lanes.

Overhead signs would be installed to notify drivers as they approach the beginning of the express lanes. DMS placed in approximately eight locations throughout the corridor would display the current toll rates to upcoming interchanges and to the end of express lanes west of Greenville Road. The toll rates would be updated every few minutes to reflect changing speed and traffic density along the express lanes.

After entering the express lanes, vehicle would pass through one or more tolling zones. Tolling equipment would be mounted on overhead cantilever structures placed along I-580 approximately every mile within the project corridor. The tolling equipment would communicate with FasTrak toll tags mounted to the windshields of vehicles that pass through the tolling zone. The tolling equipment would track the number of zones so that the correct toll is charged to the driver's FasTrak account.

Traffic in all lanes would be monitored, and toll rates would be adjusted based on the congestion in the express lanes and general purpose lanes. Equipment for traffic congestion monitoring would include vehicle detection stations, roadway sensors that can detect vehicles and transmit data to a roadside controller cabinet, and overhead radar vehicle sensors to measure traffic operations in each general purpose lane. New roadway surveillance closed-circuit television (CCTV) cameras for off-site observation of traffic would also be installed at 1-mile intervals in the project limits.

If the monitoring system finds that congestion is low and the express lanes can accommodate more vehicles, the toll rate would be low. If the express lanes have less capacity, the toll rate would be increased as needed, up to a maximum toll rate to be determined, to deter SOVs from entering. The toll increase for SOVs would be used to maintain the minimum average operating speed of 45 mph for HOVs (set by 23 USC 166[d][2]) and the target LOS of C or D for HOVs (California Streets and Highways Code Section 149.5[b]). If the express lanes reach capacity, the message on the

DMS would change to read "HOV only." At that point, only HOVs would be allowed into the lanes. SOVs would not be allowed even if they have a FasTrak toll tag.

During off-peak hours, the DMS would display a $0 toll or a message such as "OPEN TO ALL," and the express lanes would function as general purpose lanes. If needed, the DMS would display other messages if the express lanes are closed for maintenance or incident response.

2.1.3 Project Construction

The existing HOV lane would be converted to an express lane facility by eliminating existing striping, delineating travel lanes, and restriping the roadway. Signs, toll structures, lighting, and utility equipment would be installed, as described further below. Project activities east of Greenville Road would be limited to placement of temporary signage during construction.

The project would take approximately 1.5 years to construct.

Signage. The project would construct approximately 15 express lane signs: approximately eight DMS that would display the current toll rate and destination information, and approximately seven fixed-message signs.

Most of the DMS would be mounted on cantilever structures in the median. Three are anticipated to be mounted on the existing bridge structures at Hopyard Road and Hacienda Drive, and approximately one would be set on wooden posts on the shoulder.

Cantilever structures for the signs would be approximately 27 feet in height. Signs mounted on wooden posts would be approximately 17 to 26 feet in height. Smaller signs would also be mounted on the median barrier. The signs would be the same as or similar to existing HOV lane signage used along eastbound I-580 in the project corridor.

All sign structures would be installed within the existing I-580 median and within the footprint of the I-580 Eastbound HOV Lane Project phases.

Toll Structures. The project would construct approximately 14 cantilever structures mounted with toll collection equipment. Another toll collection device would be mounted on an overhead sign. The toll structures would be approximately 26 feet in height. FasTrak electronic tolling system equipment mounted on the cantilever arms would communicate with FasTrak toll tags in SOVs in the express lane to record and charge for trips.

Lighting. Lighting in the median is proposed on the project-related overhead signs and toll structures as well as on mast-arm luminaires. The maximum height of the luminaires would be 35 to 40 feet. The exact spacing and number of mast-arm luminaires in the project corridor would be determined during project design in coordination with the Department.

Utilities. Service and controller cabinets and their concrete pad foundations would be installed along the shoulders on both sides of I-580. Metal beam guard rails or concrete barriers may be installed to protect a limited number of cabinet locations.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The areas where trenching would take place are entirely within the footprint of disturbance for the I-580 Eastbound HOV Lane Project phases. Additionally, conduit may be laterally drilled across the freeway to the median where needed to provide power and communication feeds to the new overhead signs and toll structures.

3.1 REGULATORY BACKGROUND

Under 1990 Clean Air Act (CAA) Amendments, the U.S. Department of Transportation (DOT) cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP) 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 (RTPs) 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 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 the Metropolitan Transportation Commission (MTC), 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 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 project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

The concept of transportation conformity was introduced in the CAA 1977 amendments. Transportation conformity requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to violations of the national ambient air quality standards (NAAQS). Conformity requirements were made substantially more rigorous in the 1990 CAA amendments, and the transportation conformity regulation that details implementation of the new requirements was issued in November 1993.

DOT and the EPA developed guidance for determining conformity of transportation plans, programs, and projects in November 1993 in the Transportation Conformity Rule (40 Code of

Federal Regulations [CFR] 51 and 40 CFR 93). The demonstration of conformity to the SIP is the responsibility of the local Metropolitan Planning Organization (MPO), which is also responsible for preparing RTPs and associated demonstration of SIP conformity. Section 93.114 of the Transportation Conformity Rule states that "there must be a currently conforming regional transportation plan and transportation improvement plan at the time of project approval."

The MTC is the designated federal MPO and state regional transportation planning agency for Alameda County. As such, the MTC coordinates the region's major transportation projects and programs, and promotes regionalism in transportation investment decisions.

3.1.1 Statutory Requirements for PM Hot Spot Analyses

On March 10, 2006, the EPA issued a final transportation conformity rule (40 CFR 51.390 and Part 93) that addresses local air quality impacts in PM_{10} and $PM_{2.5}$ nonattainment and maintenance areas. The final rule requires a hot spot analysis to be performed for a Project of Air Quality Concern (POAQC) or any other project identified by the $PM_{2.5}$ SIP as a localized air quality concern. Transportation conformity, under CAA Section 176(c) (42 U.S.C. 7506(c)), requires that federally supported highway and transportation project activities conform to the SIP, if one exists. The rule provides criteria and procedures to ensure that these activities will not create new violations or worsen existing violations, or prevent adherence to relevant NAAQS as described in 40 CFR 93.101.

EPA's final rule, 40 CFR 93.123(b)(1), defines POAQCs as:

> (i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
>
> (ii) Projects affecting intersections that are at Level-of-Service (LOS) D, E, or F with a significant number of diesel vehicles, or those that will change to Level-of-Service D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;
>
> (iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;
>
> (iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and
>
> (v) Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ or PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

In March 2006, the FHWA and EPA issued a guidance document entitled *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (FHWA and EPA 2006). This guidance details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to generate new air quality violations, worsen existing violations, or delay attainment of NAAQS

for $PM_{2.5}$ or PM_{10}. The PM_{10} hot spot analysis is not required for project-level conformity because the area is in attainment or unclassified for the national PM_{10} standards.

Hot spot analyses only need to be performed for POAQCs. POAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in a $PM_{2.5}$ or PM_{10} SIP as a project of localized air quality concern. The following list provides examples of POAQCs.

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) where 8 percent or more of such AADT is diesel truck traffic.
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal.
- Expansion of an existing highway or other facility that affects a congested intersection (operating at LOS D, E, or F) that has a significant increase in the number of diesel trucks.
- Similar highway projects that involve a significant increase in the number of diesel transit buses and/or diesel trucks.

The list below provides examples of projects that are not of air quality concern.

- Any new or expanded highway project that primarily serves gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at LOS D, E, or F.
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen $PM_{2.5}$ or PM_{10} violations.
- Intersection channelization projects, traffic circles or roundabouts, intersection signalization projects at individual intersections, and interchange reconfiguration projects that are designed to improve traffic flow and vehicle speeds, and do not involve any increases in idling. Thus, they would be expected to have a neutral or positive influence on $PM_{2.5}$ or PM_{10} emissions.

For projects identified as not being POAQCs, qualitative $PM_{2.5}$ (for regions without an approved conformity SIP) hot spot analyses are not required. For these types of projects, state and local project sponsors should briefly document in their project-level conformity determinations that CAA and 40 CFR 93.116 requirements were met without a hot spot analysis, since the projects have been found to not be of air quality concern under 40 CFR 93.123(b)(1). The project area is

classified as a nonattainment area for the federal $PM_{2.5}$ standard, therefore a determination must be made as to whether it would result in a $PM_{2.5}$ hot spot.

Of the five POAQC types identified above, the project most likely falls into the first category: "A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 AADT where 8 percent or more of such AADT is diesel truck traffic." As shown in Table 3-1, the most recent Department traffic counts for I-580 show that the project corridor already exceeds 125,000 total AADT and 8 percent trucks (i.e., 10,000 truck AADT).

Table 3-1. 2009 Total AADT and Truck AADT

I-580 Segment	Post Mile	Total AADT	Truck AADT	% Trucks
East of Livermore, Greenville Road	8.265	134,000	13,936	10.4
West of Livermore, Greenville Road	8.265	133,000	11,079	8.33
East of First Street	10.689	158,000	19,276	12.2
West of First Street	10.689	159,000	7,235	4.55

Source: Caltrans 2009b

Consequently, a qualitative project-level $PM_{2.5}$ hot spot analysis was conducted to assess whether the project would cause or contribute to any new localized $PM_{2.5}$ violations, or increase the frequency or severity of any existing violations, or delay timely attainment of the or $PM_{2.5}$ NAAQS.

3.1.2 Ambient Air Quality Standards

- **24-hour $PM_{2.5}$ Standard:** 35.0 micrograms per cubic meter ($\mu g/m^3$)
- **Annual $PM_{2.5}$ Standard:** 15.0 $\mu g/m^3$

The Bay Area was designated as a nonattainment area for the federal $PM_{2.5}$ standard on October 8, 2009, with an effective date of December 14, 2009. The Bay Area Air Quality Management District (BAAQMD) must submit a SIP to the EPA by December 14, 2012 demonstrating how the Bay Area will achieve the $PM_{2.5}$ NAAQS by December 14, 2014.

The 24-hour $PM_{2.5}$ standard is based on 3-year average of the 98th percentile of 24-hour recorded concentrations; the annual standard is based on 3-year average of the annual arithmetic mean $PM_{2.5}$ recorded at the monitoring station. A $PM_{2.5}$ hot spot analysis must consider both standards, unless it is determined for a given area that meeting the controlling standard would ensure that CAA requirements are met for both standards. The interagency consultation process should be used to discuss how the qualitative $PM_{2.5}$ hot spot analysis meets statutory and regulatory requirements for both standards, depending on the factors that are evaluated for a given project.

3.2 PM2.5 HOT SPOT ANALYSIS

A hot spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot spot analysis assesses the air quality impacts at the project level – a scale

smaller than an entire nonattainment or maintenance area, such as for congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets the federal CAA conformity requirements to support state and local air quality goals with respect to achieving the attainment status in a timely manner. When a hot spot analysis is required, it is included in the project-level conformity determination that is made by FHWA or the Federal Transit Administration (FTA).

3.2.1 Analysis Methodology and Types of Emissions Considered

The EPA and FHWA established in the *Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* (FHWA and EPA 2006) the following two methods for completing a $PM_{2.5}$ hot spot analysis:

1. Comparison to another location with similar characteristics (pollutant trend within the air basin)

2. Air quality studies for the proposed project location (ambient PM trend analysis in the project area)

This analysis uses a combined approach to demonstrate that the proposed project would not result in a new or worsened $PM_{2.5}$ violation. Method 1 was used to establish that the proposed project area will meet the NAAQS. Method 2 was used to demonstrate that implementation of the proposed project would not delay attainment of the NAAQS.

The analysis was based on directly emitted $PM_{2.5}$ emissions, including tailpipe, brake wear, and tire wear. Re-entrained dust caused by vehicles traveling over paved and unpaved roads was not included in the qualitative analysis, as the California Air Resources Board (CARB) has not made a determination that re-entrained road dust is a significant contributor to ambient $PM_{2.5}$ concentrations in the project region.

Secondary particles formed through $PM_{2.5}$ and PM_{10} precursor emissions from a transportation project take several hours to form in the atmosphere, giving emissions time to disperse beyond the immediate project area of concern for localized analyses; therefore, they were not considered in this hot spot analysis. Secondary emissions of $PM_{2.5}$ and PM_{10} are considered as part of the regional emission analysis prepared for the conforming RTP and Federal Transportation Improvement Program (FTIP).

Project construction is anticipated to last approximately 1.5 years. In addition, the project must comply with BAAQMD construction-related fugitive dust control measures, which will ensure that fugitive dust from construction activities is minimized. Consequently, construction-related $PM_{2.5}$ emissions were not included in the hot spot analysis per 40 CFR 93.123(c)(5).

3.2.2 Air Quality Trend Analysis

Local air quality data were obtained from the Livermore monitoring station to characterize existing air quality and predict future conditions in the project area. In addition to monitoring data, this analysis presents project-level $PM_{2.5}$ emissions in the future (2015 and 2030) years to help characterize the project's impact on total $PM_{2.5}$ emissions generated in the project area.

3.2.2.1 Data Considered

The nearest air quality monitoring station is the Livermore station (793 Rincon Avenue, Livermore, CA 94550), which is approximately 0.5 mile south of the project corridor.

3.2.2.2 Climate and Topography

Due to its topographic diversity, the meteorology and climate of the Bay Area is often described in terms of different subregions and their microclimates. The proposed project is located in the Livermore Valley subregion, as defined by the BAAQMD.

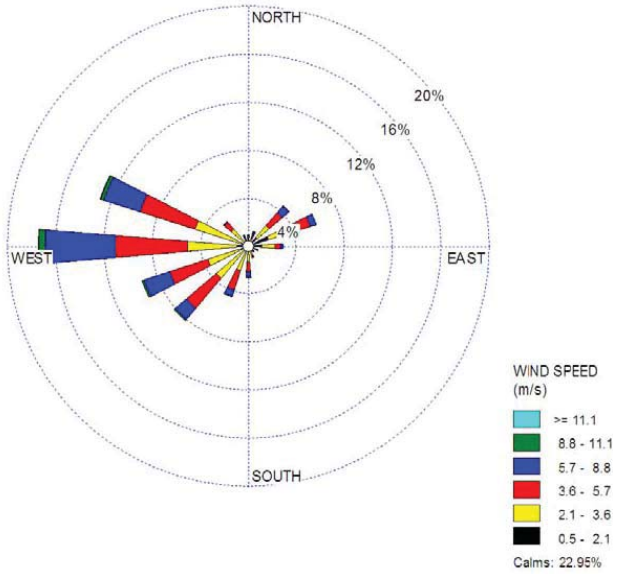
The Livermore Valley is a sheltered inland valley near the eastern border of the San Francisco Bay Area Basin (SFBAAB). The western side of the valley is bordered by 1,000- to 1,500-foot hills with two gaps connecting the valley to the central SFBAAB, the Hayward Pass, and Niles Canyon. The eastern side of the valley also is bordered by 1,000- to 1,500-foot hills with one major passage to the San Joaquin Valley called the Altamont Pass and several secondary passages. To the north lie the Black Hills and Mount Diablo. A northwest-to-southeast channel connects the Diablo Valley to the Livermore Valley. The south side of the Livermore Valley is bordered by mountains approximately 3,000 to 3,500 feet high.

During the summer months, when there is a strong inversion with a low ceiling, air movement is weak and pollutants become trapped and concentrated. Figure 3-1 shows the predominant wind direction in Livermore. Maximum summer temperatures in the Livermore Valley range from the high 80s to low 90s, with extremes in the 100s. Average winter maximum temperatures range from the high 50s to low 60s, while minimum temperatures are from the mid to high 30s, with extremes in the high teens and low 20s.

Air pollution potential is high in the Livermore Valley, especially for photochemical pollutants (such as ozone) in the summer and fall. High temperatures increase the potential for ozone to build up. The valley not only traps locally generated pollutants but can be the receptor of ozone and ozone precursors from San Francisco, Alameda, Contra Costa and Santa Clara counties. On northeasterly wind flow days, most common in the early fall, ozone may be carried west from the San Joaquin Valley to the Livermore Valley.

During the winter, the sheltering effect of the valley, its distance from moderating water bodies, and the presence of a strong high pressure system contribute to the development of strong, surface-based temperature inversions. Pollutants such as carbon monoxide and particulate matter generated by motor vehicles, fireplaces, and agricultural burning can become concentrated. Air pollution problems could intensify because of population growth and increased commuting through the subregion (BAAQMD 2011).

Figure 3-1. Predominant Wind Direction at Livermore Municipal Airport



Source: California Air Resources Board 2011 Livermore Municipal (ID24927, NCDC)

3.2.2.3 Trends in $PM_{2.5}$ Concentrations

Monitored $PM_{2.5}$ concentrations at the Livermore monitoring station for the past four years (2007–2010) are presented in Table 3-2. The data indicates that the 24-hour average $PM_{2.5}$ concentrations have exceeded the NAAQS for 2007–2009 but not 2010. However, the national annual average standard was not exceeded at the monitoring station in any of the past four years. The national 24-hour $PM_{2.5}$ standards estimated day exceedances are displayed in Table 3-2 as well.

Table 3-2. Ambient $PM_{2.5}$ Monitoring Data (µg/m^3) at the Livermore Rincon Ave. Monitoring Station (2007-2010)

Year	Estimated Days Over Standard	Annual Average (µg/m^3)		High 24-Hr Average (µg/m^3)	
	Nat'l	Nat'l	State	Nat'l	State
2010	0.0	7.6	7.6	34.7	34.7
2009	**4.0**	9.1	9.1	**45.7**	45.7
2008	**2.1**	10.0	10.0	**38.6**	52.7
2007	**9.0**	8.9	8.9	**54.9**	54.9

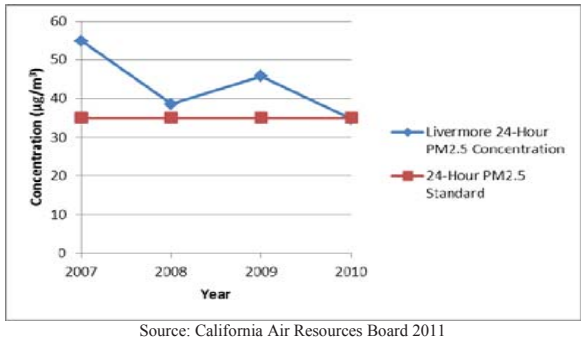
Source: CARB website, www.arb.ca.gov, accessed July 2011.
Notes:
µg/m^3 = micrograms per cubic meter
Exceedances of the State or National standard shown in **bold** text.
An exceedance is not necessarily a violation. California standards are not to be exceeded; National standards are not to be exceeded more than once per year.

As required by the applicable transportation conformity regulations for $PM_{2.5}$, a trend analysis has been conducted and compared to the current 24-hour and annual average NAAQS. The current 24-hour standard is based on the 3-year average of the 98th percentile of 24-hour average $PM_{2.5}$ concentrations. The current annual standard is based on a three-year average of annual mean $PM_{2.5}$ concentrations.

As shown in Figure 3-2, 24-hour average $PM_{2.5}$ concentrations at the Livermore monitoring station show a decreasing trend from 2007 to 2010. These values have remained above the current national standard of 35 µg/m^3 except for 2010, but below the old standard of 65 µg/m^3.

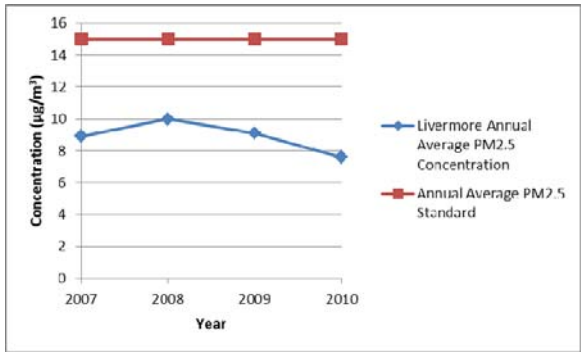
Figure 3-3 indicates that annual average $PM_{2.5}$ concentrations recorded at the Livermore monitoring station peaked in 2008 and decreased through 2010. These values have remained below the current national standard of 15.0 µg/m^3.

Figure 3-2. 24-Hour Average $PM_{2.5}$ Concentrations (µg/m^3) at the Livermore Rincon Ave. Monitoring Station (2007-2010)



Source: California Air Resources Board 2011

Figure 3-3. Annual Average $PM_{2.5}$ Concentrations (µg/m^3) at the Livermore Rincon Ave. Monitoring Station (2007-2001)



Source: California Air Resources Board 2011

3.2.2.4 Surrounding Land Uses

The BAAQMD generally defines a sensitive receptor as a facility or land use that houses or attracts members of the population, such as children, the elderly, and people with illnesses, who are particularly sensitive to the effects of air pollutants.

Various sensitive receptors are located in the vicinity of the project area. Figure 3-4 shows the project area and shows residential neighborhoods that contain sensitive receptor sites. Land use compatibility issues relative to the siting of pollution-emitting sources or the siting of sensitive receptors must be considered. In the case of schools, state law requires that siting decisions consider the potential for toxic or harmful air emissions in the surrounding area. Figure 3-4 does not include the locations of scattered or individual sensitive receptors.

Surrounding land uses include residential developments south and north of I-580 in Dublin, Pleasanton, and Livermore. The I-580 Eastbound Express Lanes Project would not shift lanes closer to residential receptors; therefore, the project is not expected to decrease air quality in those locations. In addition, the project would increase vehicle speeds and reduce total delay. Since motor vehicle emissions tend to decrease with increased speed and reduced congestion, the project would improve air quality in the vicinity of nearby receptors.

3.2.2.5 Future Trends

Emission trend data for the SFBAAB from the 2009 edition of *The California Almanac of Emissions and Air Quality* published by the CARB was used to provide an estimate of potential $PM_{2.5}$ trends in the vicinity of the project area. While the CARB's Almanac does not provide emission trend data on the county level, the regional trend data can be used to provide insight on the general trends of air quality in the region, as implementation of emission standards and control requirements that have an effect on regional pollutant concentrations are likely to result in similar trends at the local level. Table 3-3 presents $PM_{2.5}$ emission trends in the SFBAAB for the years 1975 to 2020.

Table 3-3. $PM_{2.5}$ Emission Trends in the San Francisco Bay Area Air Basin, 1975–2020 (tons per day)

Year	Total Emissions	Total On-Road Mobile Sources	Diesel Vehicle Mobile Sources	Gasoline Vehicles Mobile Sources
1975	80	5	2	3
1980	78	7	4	3
1985	78	8	6	2
1990	84	10	7	3
1995	82	7	4	3
2000	84	7	4	3
2005	81	7	3	4
2010	82	7	3	4
2015	83	7	2	5
2020	85	7	1	5

Source: California Air Resources Board 2010

Figure 3-5 presents emissions associated with on-road emissions and indicates that total on-road emissions are expected to remain constant through 2020, with increases in emissions from on-road gasoline vehicles offset by substantial decreases in emissions from on-road diesel vehicles. Emissions of directly emitted $PM_{2.5}$ from diesel motor vehicles have been decreasing since 1990 due to adoption of more stringent emission standards, even though population and vehicles miles traveled (VMT) have been increasing. Figure 3-5 indicates that total $PM_{2.5}$ emissions have remained relatively constant in the SFBAAB between 1975 and 2005 and are projected to increase slightly through 2020. However, because total on-road emissions are expected to remain constant, the slight increases expected in overall $PM_{2.5}$ are likely not the result of on-road sources.

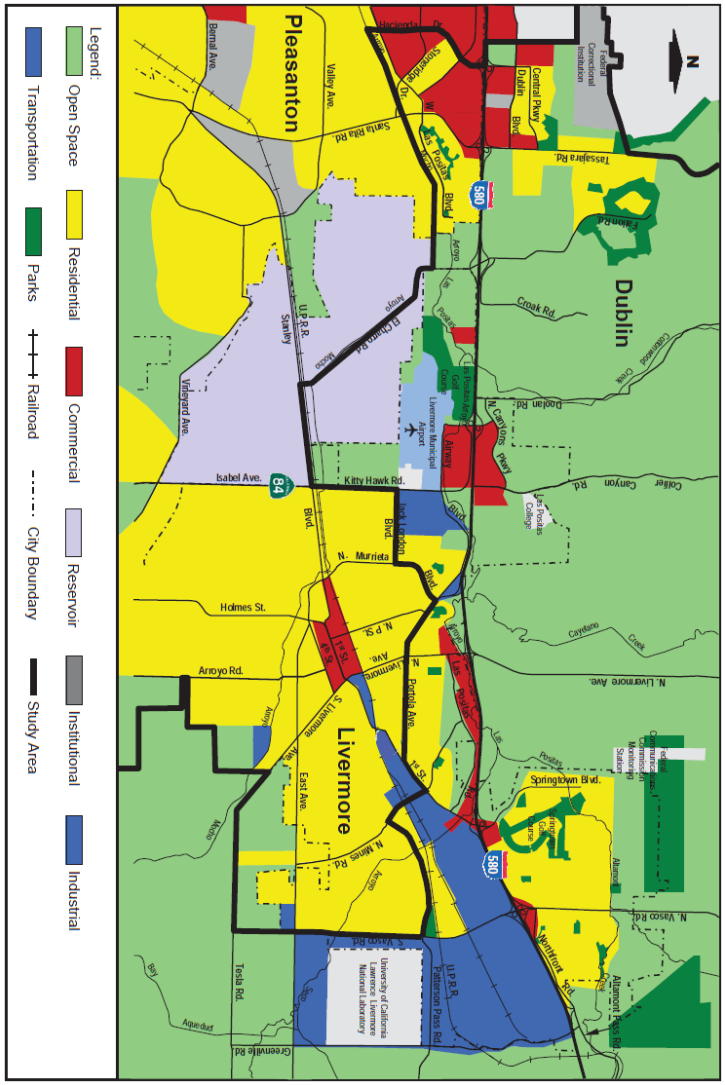
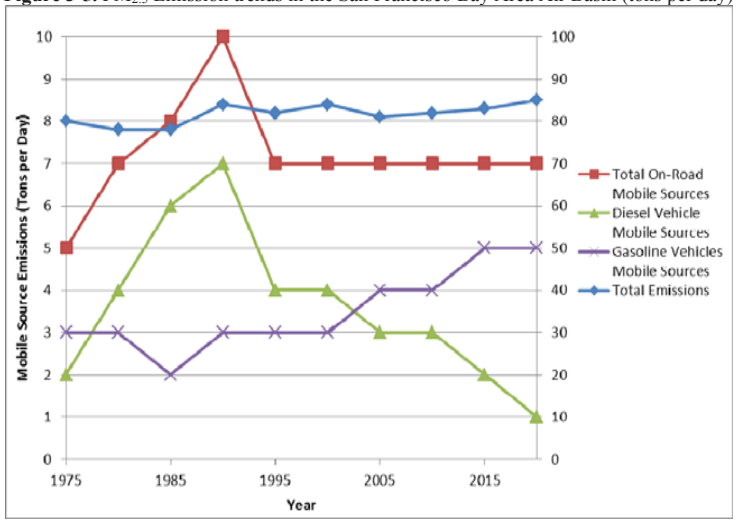


Figure 3-4. Land Uses In Project Area

Figure 3-5. $PM_{2.5}$ Emission trends in the San Francisco Bay Area Air Basin (tons per day)



Source: California Air Resources Board 2011

3.2.3 Transportation and Traffic Analysis

3.2.3.1 Transportation and Traffic

Anticipated regional growth in population and employment could result in increased traffic within the project area. Modeled traffic volumes and operating conditions were obtained from the traffic data prepared by the project traffic engineers (URS 2010), including peak hour VMT data for the No Build and Build scenarios.

VMT data included vehicle activity for affected roadways in the immediate project region. The traffic data used for emissions modeling is summarized in Table 3-4. Table 3-4 presents peak period VMT distribution and speed.

Table 3-4. Peak Hour VMT and Speeds

Peak Hour Scenario	VMT	Speed (mph)
No Build 2015	68,317	40
No Build 2030	55,384	18
Build 2015	76,578	42
Build 2030	81,260	35

Mainline Average Daily Traffic Volumes and Mainline Truck Volumes

Tables 3-5 and 3-6 present the total AADT volumes as well as truck AADT volumes for the I-580 corridor in the project vicinity used for the emissions analysis. Volumes are presented for eastbound I-580 only, as the project would not affect operations in the westbound direction.

Table 3-5. No Build and Build Total AADT and Truck AADT, 2015 (Eastbound Direction Only)

Segments	NO BUILD		BUILD	
	Total AADT	Truck AADT*	Total AADT	Truck AADT*
Mainline East of Eden Canyon	78,830	15,766	78,830	15,766
Mainline East of San Ramon Road	79,150	15,830	79,100	15,820
Mainline East of Hopyard Road Off	43,010	8,602	42,690	8,538
Mainline East of 680	72,650	14,530	75,850	15,170
Mainline East of Hopyard Road	86,070	17,214	89,930	17,986
Mainline East of Hacienda Drive	82,190	16,438	92,750	18,550
Mainline East of Tassajara Road	90,800	18,160	102,500	20,500
Mainline East of El Charro Road	93,420	18,684	105,120	21,024
Mainline East of Airway Boulevard	90,120	18,024	104,290	20,858
Mainline East of NB Isabel Ave	98,880	19,776	108,880	21,776
Mainline East of Portola Avenue	98,880	19,776	108,880	21,776
Mainline East of Livermore Avenue	90,680	18,136	102,740	20,548
Mainline East of Route 84	94,640	18,928	106,010	21,202
Mainline East of Vasco Road	82,500	16,500	90,720	18,144
Mainline East of Truck Scale	81,970	16,394	90,300	18,060
Mainline East of Greenville Road	91,790	18,358	90,920	18,184

Source: URS 2010

* The Alameda County Travel Demand Model (ACCMA 2005) and other studies conducted along the I-580 corridor project that trucks will represent 20 percent of future traffic under both No Build and Build conditions. Current truck percentages in the project area range from 8 to 12 percent (Caltrans 2008).

Table 3-6. No Build and Build Total AADT and Truck AADT, 2030 (Eastbound Direction Only)

Segments	NO BUILD		BUILD	
	Total AADT	Truck AADT*	Total AADT	Truck AADT*
Mainline East of Eden Canyon	81,560	16,312	80,130	16,026
Mainline East of San Ramon Road	84,460	16,892	82,490	16,498
Mainline East of Hopyard Road Off	49,230	9,846	47,610	9,522
Mainline East of 680	93,830	18,766	91,460	18,292
Mainline East of Hopyard Road	109,480	21,896	108,960	21,792
Mainline East of Hacienda Drive	100,380	20,076	105,410	21,082
Mainline East of Tassajara Road	104,700	20,940	114,250	22,850
Mainline East of El Charro Road	113,480	22,696	122,410	24,482
Mainline East of Airway Boulevard	113,570	22,714	123,760	24,752
Mainline East of NB Isabel Ave	125,050	25,010	133,980	26,796
Mainline East of Portola Avenue	125,050	25,010	133,980	26,796
Mainline East of Livermore Avenue	113,320	22,664	123,570	24,714
Mainline East of Route 84	112,890	22,578	122,120	24,424
Mainline East of Vasco Road	105,420	21,084	113,250	22,650
Mainline East of Truck Scale	104,750	20,950	112,690	22,538
Mainline East of Greenville Road	122,060	24,412	121,090	24,218

Source: URS 2010

* The Alameda County Travel Demand Model (ACCMA 2005) and other studies conducted along the I-580 corridor project that trucks will represent 20 percent of future traffic under both No Build and Build conditions. Current truck percentages in the project area range from 8 to 12 percent (Caltrans 2008).

Mainline Level of Service

Attachment A presents mainline LOS data for the years 2015 and 2030. Project implementation would have a negligible impact on overall a.m. peak hour operations but would improve system-wide operations in the p.m. peak hour, particularly in 2030.

Congestion Relief and System-Wide Improvements

The project would provide congestion relief and improve system-wide operations by improving traffic flow and reducing vehicle hours of delay. During the p.m. peak hour, the project would increase average speeds by approximately 2 miles per hour in 2015 and 17 miles per hour in 2030. System-wide congestion would improve in both the horizon year a.m. and p.m. peak hours, as increased average network speeds would decrease delay with compared with No Build conditions.

3.2.3.2 Transportation and Traffic Analysis

Vehicle emission rates were determined using EMFAC2007 and the VMT and speed data presented in Table 3-4. The EMFAC2007 program assumed the SFBAAB Alameda County regional traffic data. The vehicle fleet mix on I-580 was based on the data in Tables 3-5 and 3-6 using conversion factors in Table B.5 from the Caltrans CO protocol (Garza, Graney, and Sperling 1997).

The modeling of vehicle emission rates does not account for future decreases from continuing improvements in engine technology and the retirement of older, higher-emitting vehicles. The

emission factors used in the analysis also do not reflect the California Truck and Bus Regulation, which CARB initially approved in 2008 and amended in 2010. The regulation requires fleets that operate in California to reduce diesel truck and bus emissions by retrofitting or replacing existing engines. The amended regulation would require installation of diesel particulate matter retrofits beginning January 1, 2012 and replacement of older (pre-1994) trucks starting January 1, 2015. By January 1, 2023, nearly all vehicles would need to have 2010 model year engines or equivalent (CARB 2011). The new regulations will make the average truck more efficient, reducing emissions in all of the scenarios and decreasing the difference in emissions between the Build and No Build scenarios. As EMFAC2007 uses a much broader range of engine model years for each scenario, the model output tends to overstate emissions for both alternatives.

In addition, the emissions modeling used daily VMT that was calculated by multiplying peak hour VMT for the Build and No Build scenarios by 24 (for hours per day), as daily VMT data were not available. As a result, the calculation method provides a worst-case estimate for total emissions.

Table 3-7 summarizes the modeled daily $PM_{2.5}$ emissions. The differences in emissions between the Build and No Build conditions represent emissions generated directly as a result of implementation of the Build Alternative in the construction interim year (2015) and the design/future year (2030).

Table 3-7. Daily Modeled $PM_{2.5}$ Emissions

	Peak Hour VMT	$PM_{2.5}$ Emission Factor (grams/mile)	Pounds/Day $PM_{2.5}$
Build 2015	76,578	0.020	81.04
No Build 2015	68,317	0.021	75.91
Build 2030	81,260	0.014	60.19
No Build 2030	55,384	0.031	90.84

Overall, the Build Alternative would result in a net decrease in $PM_{2.5}$ emissions over the life of the project, compared with the No Build Alternative. The model output indicates that the Build Alternative would decrease $PM_{2.5}$ emissions by approximately 30 pounds per day in 2030 compared to No Build. Although the conservative methodology used to calculate the emissions overstates the decrease, a decrease in $PM_{2.5}$ will result from project-related improvements in traffic operations and overall system efficiency as well as from the improvements in engine technology, retirement of higher-emitting vehicles, and regulatory changes described above.

For 2015, Table 3-7 shows an increase in $PM_{2.5}$ emissions of approximately 5 pounds per day in the Build scenario compared to No Build. This increase is expected to be much smaller than reflected in the model output because of the conservative methodology used to calculate emissions. A slight increase in $PM_{2.5}$ emissions in the opening year is expected because the increase in vehicle throughput has a larger impact on emissions than the increase in speeds.

3.3 CONCLUSION

AADT on I-580 in the project limits exceeds the FHWA and EPA's POAQC threshold of 125,000 and 8 percent trucks (10,000 truck AADT). Implementation of the Build Alternative would not significantly affect diesel truck percentages as the estimated percentage of diesel trucks is the same in the Build and No Build scenarios. As indicated in Table 3-7, $PM_{2.5}$ emissions in 2030 would decrease when compared to the No Build Alternative due to travel time savings, decreases in hours of delay, and improvements in average network speed under the Build Alternative when compared to the No Build Alternative. Modeling of $PM_{2.5}$ exhaust emissions indicate that implementation of the project would result in decreases in daily $PM_{2.5}$ exhaust emissions over No Build conditions in 2030.

Transportation conformity is required under CAA Section 176(c) (42 U.S.C. 7506(c)) and requires that no federal dollars be used to fund a transportation project unless it can be clearly demonstrated that the project would not cause or contribute to violations of the NAAQS. As required by Final EPA rule published on March 10, 2006, this qualitative assessment demonstrates that the I-580 Eastbound Express Lanes Project meets the CAA conformity requirements and will not conflict with state and local measures to improve regional air quality. Implementation of the propose project will not result in new violations of the federal $PM_{2.5}$ air quality standards for the following reasons:

- Based on representative monitoring data, ambient 24-hour average and annual average $PM_{2.5}$ concentrations are declining (see Figures 3-2 and 3-3).
- Based on representative monitoring data, monitored annual average $PM_{2.5}$ concentrations have not exceed the national standard of 15.0 $\mu g/m^3$ in the past four years (2007–2010) (see Table 3-2).
- Based on representative monitoring data, monitored 24-hour average $PM_{2.5}$ concentrations exceeded the federal standard of 35 $\mu g/m^3$ nine times in 2007, twice in 2008, four times in 2009, and zero times in 2010, indicating that 24-hour $PM_{2.5}$ concentrations are likely decreasing.
- In general, construction of the Build Alternative would result in improved level of service and reduced delay on I-580 in the project corridor.
- Construction of the Build Alternative would increase overall speeds in the project corridor during both the opening and horizon years.
- Although the analysis shows an increase in $PM_{2.5}$ emissions with the 2015 Build condition (see Table 3-7), the increase is overstated because of the conservative nature of the emissions calculation method.
- The analysis shows that $PM_{2.5}$ emissions would decrease with the 2030 Build condition when compared to No Build, thereby reducing total $PM_{2.5}$ emissions generated within the project region (see Table 3-7).

- Compared with the No Build Alternative, the Build Alternative would result in a net decrease in $PM_{2.5}$ emissions over the life of the project.
- Implementation of the proposed project would not significantly affect diesel truck percentages between Build and No Build alternatives (assumed 20 percent in both cases).

For these reasons, future or worsened $PM_{2.5}$ violations of any standards are not anticipated. Therefore, the proposed I-580 Eastbound Express Lanes Project meets the conformity hot spot requirements in 40 CFR 93.116 and 93.126 for $PM_{2.5}$.

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Attachment A
Mainline Levels of Service

Table A-1. No Build and Build LOS, 2015

Segments	NO BUILD				BUILD[1]			
	AM		PM		AM		PM	
	HOV	Mixed Flow	HOV	Mixed Flow	HOV	Mixed Flow[2]	HOV	Mixed Flow[2]
San Ramon Rd. – Interstate 680/580 Interchange	-	F	-	F	-	F	-	F
Interstate 680/580 Interchange – Hopyard Rd./Dougherty Rd.	-	C	-	C	-	**B**	-	C
Hopyard Road/Dougherty Rd. – Hacienda Dr.	-	E	-	D	-	**D**	-	E
Hacienda Dr. – Santa Rita Rd./Tassajara Rd.	A	D	A	D	B	D	C	E
Santa Rita Rd./Tassajara Rd. – El Charro Rd./Fallon Rd.	A	D	A	D	B	D	C	D
El Charro Rd./Fallon Rd. – Airway Blvd.	A	D	A	D	B	D	C	D
Airway Blvd. – Isabel Ave.	A	D	A	E	A	**C**	C	**D**
Isabel Ave. - Livermore Ave.	A	C	A	D	A	**B**	B	D
Livermore Ave. – First St.	A	C	A	D	A	C	B	D
First St. – Vasco Rd.	A	D	A	D	A	**C**	B	E
Vasco Rd. – Greenville Rd.	A	C	A	D	A	C	B	D
East of Greenville Rd.		B	-	C	-	**A**	-	C

Source: URS 2010

1. The project will implement dynamic pricing, where toll rates for single-occupant vehicles will vary based on the level of congestion. Vehicle detection systems will automatically adjust tolls to maintain free-flowing conditions (LOS C/D) in the express lanes.

2. **Boldfaced** LOS letters indicate improvement in Level of Service compared with the No Build Alternative.

Table A-2. No Build and Build LOS, 2030

Segments	NO BUILD				BUILD[1]			
	AM		PM		AM		PM	
	HOV	Mixed Flow	HOV	Mixed Flow	HOV	Mixed Flow[2]	HOV	Mixed Flow[2]
San Ramon Rd. – Interstate 680/580 Interchange	-	F	-	F	-	F	-	F
Interstate 680/580 Interchange – Hopyard Rd./Dougherty Rd.	-	C	-	F	-	C	-	**C**
Hopyard Road/Dougherty Rd. – Hacienda Dr.	-	D	-	F	-	D	-	F
Hacienda Dr. – Santa Rita Rd./Tassajara Rd.	A	D	A	F	C	D	C	F
Santa Rita Rd./Tassajara Rd. – El Charro Rd./Fallon Rd.	A	D	A	D	C	D	C	E
El Charro Rd./Fallon Rd. – Airway Blvd.	A	D	A	D	B	D	C	D
Airway Blvd. – Isabel Ave.	A	C	A	F	B	C	C	**E**
Isabel Ave. - Livermore Ave.	A	C	A	F	B	C	C	**D**
Livermore Ave. – First St.	A	C	A	F	B	C	C	**D**
First St. – Vasco Rd.	A	D	A	F	B	**C**	B	**E**
Vasco Rd. – Greenville Rd.	A	B	A	F	B	B	B	**E**
East of Greenville Rd.	-	C	-	C	-	**B**	-	C

Source: URS 2010

1. The project will implement dynamic pricing, where toll rates for single-occupant vehicles will vary based on the level of congestion. Vehicle detection systems will automatically adjust tolls to maintain free-flowing conditions (LOS C/D) in the express lanes.

2. Boldfaced letters indicate improvement in Level of Service compared with the No Build Alternative.

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Part D2: Biological Conservation Measures

- **Amended United States Fish and Wildlife Service Biological Opinion for the I-580 Eastbound HOV Lane Project (USFWS File No. 81420-2008-F-0495-R001-3, October 26, 2011**
- **Amended United States Fish and Wildlife Service Biological Opinion for the I-580 Eastbound HOV Lane Project (USFWS File No. 81420-2008-F-0495-R002-1, July 2, 2012)**
- **No Effect Determination for the I-580 Eastbound Express Lanes Project (July 5, 2013)**

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2008-F-0495-R001-3

OCT 26 2011

Mr. James Richards
California Department Transportation
Attn: John Yeakel
Environmental Division, MS 8E
111 Grand Avenue
Oakland, California 94612

Subject: Reinitiation of the Biological Opinion on the Effects of the Proposed Interstate 580 Eastbound High Occupancy Vehicle (HOV) Project from East of Greenville Road to Hacienda Drive in Alameda County, California (Caltrans EA 29081)

Dear Mr. Richards:

This is in response to your June 13, 2011, request for reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Interstate 580 Eastbound HOV Project from East of Greenville Road to Hacienda Drive in Alameda County, California. The reinitiation is prompted by the changes to the project description. The California Department of Transportation (Caltrans) has increased the proposed construction footprint with the following additions:

1. An eastbound auxiliary lane from 0.4 mile west of the Portola Avenue overcrossing to 0.2 mile west of First Street;
2. An additional 6 feet width of pavement in the eastbound direction;
3. Widening of the North Livermore Avenue Overcrossing;
4. A soundwall;
5. Eleven retaining walls;
6. Widening of two bridge crossings over Arroyo Las Positas; and

7. Extension of the culvert on Arroyo Seco between El Charro Road/Fallon Road and First Street.

The Service is issuing a complete revision of the biological opinion due to the number of changes and multiple reinitiations. At issue are the potential effects on the threatened California red-legged frog (*Rana draytonii*). This document represents the Service's revised biological opinion on the effects of the proposed action on this listed species. This document has been prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*)(Act).

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users legislation (23 U.S.C. 327) allows the Secretary of the U.S. Department of Transportation acting through the Federal Highway Administration (FHWA) to establish a Surface Transportation Project Delivery Pilot Program, whereby a State may assume the FHWA responsibilities under the National Environmental Policy Act for environmental review, agency consultation and other actions pertaining to the review or approval of a specific project. Caltrans assumed these responsibilities for the FHWA on July 1, 2007 through a Memorandum of Understanding (MOU) within the State of California (http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation /sec6005mou.pdf) and are exercising this authority as the federal nexus for section 7 consultation on this project.

This revised biological opinion is based on: (1) the July 2007 Biological Opinion (Service file #1-1-07-F-0273); (2) the December 19, 2007, amendment for the first reinitiation (Service file #81420-2008-F-0495); (3) Caltrans' June 13, 2011, request for an additional reinitiation of consultation; (4) revised California red-legged frog habitat mapping and acreage calculations provided by Caltrans on July 15, 2011; (5) an edited project description provided by Caltrans on August 9, 2011; (6) Caltrans' requested edits regarding the September 9, 2011, draft biological opinion; and (7) other information available to the Service.

Consultation History

March 12, 2007	The Service received the February 2007 Biological Evaluation for the Interstate 580 Eastbound HOV Project from East of Greenville Road to Hacienda Drive, Alameda County, California from Caltrans. The document was accompanied by a cover letter that requested Service concurrence with Caltrans and the Alameda County Congestion Management Agency (ACCMA) determination that the proposed project was not likely to adversely affect the California red-legged frog.
May 24, 2007	The Service met with ACCMA and Caltrans to discuss the proposed project and how it was likely to adversely affect the California red-legged frog.
June 6, 2007	The Service conducted a site visit with the ACCMA and their consultants.

June 19, 2007	The Service provided ACCMA and Caltrans with a draft project description section from the biological opinion for review and comment.
June 21, 2007	The Service received ACCMA's comments on the draft project description.
July 16, 2007	The Service sent ACCMA, Caltrans, and the Federal Highway Administration the draft biological opinion (Service file #1-1-07-I-0740) for the proposed project.
July 20, 2007	The Service received an electronic mail (e-mail) message from Caltrans stating that Caltrans and the ACCMA were satisfied with the draft biological opinion and requested that it be finalized and issued.
July 23, 2007	The Service received requested edits to the draft biological opinion from the ACCMA via an e-mail message.
July 24, 2007	The Service issued the final biological opinion (Service file #1-1-07-F-0273).
November 15, 2007	The Service received a request to reinitiate consultation and amend the July 24, 2007, Biological Opinion to include activities associated with the addition of 8 feet of pavement to accommodate a future conversion to a High Occupancy Toll (HOT) lane in the eastbound and westbound directions of Interstate 580. The request included a February 2007 addendum to the biological evaluation. Caltrans concluded that the project modifications would not result in additional effects to the California red-legged frog.
December 10, 2007	The Service received a revised project description from Caltrans and ACCMA stating that the revised project design would not include additional widening of the action area at the Cottonwood Creek Bridge. The action area at the Cottonwood Creek Bridge will remain 2,500 square feet (50 x 50 feet) on Cottonwood Creek adjacent to the south side of Interstate 580.
December 13, 2007	The Service received a revised addendum to the biological evaluation covering the activities included in the revised December 13, 2007, project description. The addendum concluded that the project modifications would not result in additional effects to listed species.
December 19, 2007	The Service issued an amendment to the July 24, 2007, Biological Opinion to include the addition of 8 feet of pavement to accommodate future conversion to a HOT lane in the eastbound and westbound directions of Interstate 580 (Service file #81420-2008-F-0495).

July 19, 2010	The Service received a request from Caltrans to reinitiate consultation on the July 24, 2007, Biological Opinion and the December 19, 2007, reinitiation. The reinitiation was based on the addition of project features.
August 19, 2010	The Service sent an e-mail message to Caltrans requesting additional information in order to complete the reinitiation requested on July 19, 2010.
September 3, 2010	The Service visited the proposed project site with Caltrans and discussed the need for revised California red-legged frog habitat mapping within the proposed action area.
September 21, 2010	The Service received an e-mail message from Caltrans with more detailed project footprint mapping overlaid on aerial photography.
November 11, 2010	The Service identified what they considered California red-legged frog habitat within the proposed project footprint on maps provided by Caltrans on September 21, 2010, and sent them to Caltrans via an e-mail message.
November 17, 2010	Caltrans corresponded with the Service via e-mail messages to clarify the area of California red-legged frog habitat within the proposed project footprint. Caltrans identified this revised designation on project mapping.
January 13, 2011	The Service was informed that the reinitiation was placed on hold.
June 17, 2011	The Service received a renewed request from Caltrans to reinitiate the July 24, 2007, Biological Opinion and the December 19, 2007, reinitiation. The reinitiation was based on the addition of project features.
July 15, 2011	The Service received revised California red-legged frog habitat mapping from Caltrans via an e-mail message. The revised mapping indicated that the proposed project footprint included 4.175 acres of California red-legged frog habitat. Caltrans was aware in advance of the data request that the Service sent on July 18, 2011. Caltrans provided the necessary information in advance of receiving the July 18, 2011 letter.
July 18, 2011	The Service sent a letter to Caltrans in regards to the review of the June 17, 2011, request for reinitiation (Service file #81420-2008-F-0495-R001-1). The Service requested that Caltrans revise the area of effects to reflect the California red-legged frog habitat mapped by Caltrans on November 17, 2010.
July 28, 2011	Caltrans informed the Service via an e-mail message that the total project footprint would be 131.94 acres.

August 9, 2011 Caltrans provided the Service with edits to a draft project description via an e-mail message.

September 9, 2011 The Service issued the draft reinitiation of consultation (Service file #81420-2008-F-0495-R001-2).

September 28, 2011 The Service received a letter from Caltrans dated September 27, 2011, via an e-mail attachment requesting edits to the draft biological opinion and issuance of a final reinitiation.

October 12, 2011 The Service received a letter from Caltrans dated October 12, 2011, via an e-mail attachment, stating that Caltrans was willing to propose monitoring and measures to prevent California red-legged frogs from becoming entrapped in excavated steep-walled excavations greater than 2-foot deep but would not propose such for excavated steep-walled holes or trenches greater than 1-foot deep.

BIOLOGICAL OPINION

Description of the Proposed Action

The following project description was provided by Caltrans with minor modifications for reasons of clarity and accuracy provided by the Service.

Caltrans and FHWA, in cooperation with the ACCMA, propose to construct an eastbound HOV lane in the median of Interstate 580 between post mile 19.1, at the Hacienda Drive interchange, and post mile R7.8, just east of the Greenville Road interchange. The proposed HOV lane will be constructed with adequate width for conversion to a future HOT lane facility. HOT lanes would open up the HOV lane to paying customers and would charge users based on fluctuating freeway congestion. The project will include construction of additional pavement at the eastbound on-ramp to Interstate 580 at Hacienda Drive and between the Tassajara Road/Santa Rita Road and El Charro Road/Fallon Road interchanges to accommodate a future double HOT lane facility; eastbound auxiliary lanes from 0.4 mile west of the Portola Avenue overcrossing to 0.2 mile west of First Street, and between the First Street and Vasco Road interchanges; replace the existing westbound inside shoulder with a full pavement section and construct approximately 15 sign poles and foundations in the median, and install conduit for future tolling equipment, to accommodate the double future HOT lane facility. The project will also construct 6 feet of additional pavement in the eastbound direction from 0.4 mile west of the Portola Avenue overcrossing to 0.2 mile west of First Street including the widening of the North Livermore Avenue Overcrossing to accommodate a future double HOT lane facility; construct a soundwall and 11 retaining walls from just west of the Portola Avenue overcrossing to First Street; widen two bridge crossings over Arroyo Las Positas; and extend the culvert on Arroyo Seco. The total distance of the project is approximately 11.2 miles.

General Scope of Work

The proposed project includes the following:

1. One eastbound HOV lane in the existing Interstate 580 median between Hacienda Drive and Greenville Road.
2. A concrete or new thrie-beam median barrier.
3. 10 to14-foot wide inside and outside shoulders in the eastbound direction; eastbound auxiliary lanes between the following:
   a. El Charro Road and Airway Boulevard interchanges,
   b. 0.4 mile west of Portola Avenue overcrossing and 0.2 mile west of First Street, and
   c. First Street and Vasco Road interchanges.
4. Reconstruction of the eastbound loop on-ramp from Hacienda Drive.
5. Realignment of the eastbound loop on-ramp at Hacienda Drive and the Greenville Road eastbound off- and on-ramps.
6. Replacement of the existing 8-foot wide inside shoulder in the westbound direction with a full pavement section.
7. Construction of an estimated 15 overhead sign foundations and poles in the median, and install conduit for future tolling equipment for the future double HOT lane facility.
8. Six feet of additional pavement in the eastbound direction from 0.4 mile west of the Portola Avenue overcrossing to 0.2 mile west of First Street including the widening of the North Livermore Avenue Overcrossing to accommodate a future double HOT lane facility.
9. A soundwall and 11 retaining walls along eastbound Interstate 580 from just west of the Portola Avenue overcrossing and First Street.
10. Bridge widening over Arroyo Las Positas along eastbound Interstate 580 at the following locations:
    a. Immediately east of the Portola Avenue overcrossing, and
    b. Approximately 500 feet west of the Las Colinas Road overcrossing.

11. Extension of the culvert on Arroyo Seco.

Caltrans stated in their February 2007 Biological Evaluation that temporary construction areas are anticipated to extend approximately 12 feet beyond the toe of slope or top of cut, or less if the distance to the highway right-of-way (ROW) is less than 12 feet.

The auxiliary lanes are designed to reduce conflicts between traffic entering and exiting the highway by connecting the on-ramp of one interchange to the off-ramp of the next; auxiliary lanes are not designed to serve through-traffic. An existing auxiliary lane would be eliminated from Hacienda Drive to Santa Rita Road, where the through-lanes would be shifted to the south to accommodate the eastbound HOV lane. Eliminating the auxiliary lane would avoid impacts to Tassajara Creek and Bay Area Rapid Transit facilities in the median east of Hacienda Drive. In addition, retaining walls would be constructed along the outside shoulders, where necessary, due to existing topography and to avoid ROW acquisitions. At Cottonwood Creek, the culvert and headwall would be extended southward with the proposed widening between El Charro Road and Airway Boulevard. A concrete-lined drainage ditch, located west of Greenville Road, will be replaced with a culvert in three locations within approximately 1,180 feet. Construction activities in Cottonwood Creek and along the concrete-lined ditch will be restricted to the dry season when these features have completely dried.

Construction Schedule

It is anticipated that the project would be constructed in three major stages within approximately two years. Construction would be followed by a replacement planting contract that would require approximately six months for construction and three years for restoration plant establishment.

Most of the work would be done during daylight hours, with some work at night to allow temporary closures for tasks that could interfere with mainline traffic or create safety hazards. Any required lane closures would be limited to non-peak travel periods. Examples of tasks requiring lane closures include placing and removing temporary construction barriers, connecting or conforming improvements to ramps and mainline or shifting traffic due to widening work adjacent to the existing median and eastbound outside shoulder. To maintain traffic on Interstate 580, construction activities requiring traffic lane or ramp closures would not be permitted to occur simultaneously at adjacent interchanges.

Construction Staging

The Interstate 580 HOV Lane Project would be constructed in three major stages: HOV Segment 1, HOV Segment 2, and the Auxiliary lane Segment 3. To minimize impacts and disruption to the traveling public, each stage would be completed by section between one or two interchanges.

The first stage would extend from east of Greenville Road to west of the Portola Avenue Interchange and would be opened to traffic at the end of the first year of construction. The second stage would extend from west of the Portola Avenue Interchange to the Hacienda Drive Interchange and would be opened to traffic at the end of the second year of construction. No

location within the project limits would be under construction for longer than one year, except where construction of Stage 1 and Stage 2 overlap in the highway median.

The third stage would construct the auxiliary lanes from 0.4 mile west of the Portola Avenue overcrossing to 0.2 mile west of First Street and include the widening of the North Livermore Avenue Overcrossing and other improvements in the corridor to accommodate a future double HOT lane facility. Construction of the third stage is expected to take two years.

Construction activities that would disturb soil or have the potential to result in siltation to waterbodies will be limited to the summer season, defined in the construction contract specifications as April 15 to October 15; however, construction activities within Cottonwood Creek and the concrete-lined drainage ditch will not be initiated until these features are dry regardless of date. Best Management Practices (BMP) will be used to minimize the effect disturbed earth has on receiving waterbodies.

Each of the two construction stages would be characterized by the following sequence of activities:

Work is sectioned between one or two interchanges at a time, moving from east to west, to minimize disturbance and impacts.

1. The pavement is restriped and traffic is shifted to the south to allow median construction activities.

2. Median work is constructed behind a temporary concrete barrier (K-rail) enclosure within the construction area. Activities would include removal of median vegetation (predominately oleander shrubs) removal of thrie-beam median barrier, pavement removal, removal and/or stockpiling of soil; construction of new concrete or thrie-beam median barrier; installing signs; and new pavement delineation (striping and reflective markers are applied to the new roadway surface). Applying dust palliatives and sweeping is an on-going construction activity used to minimize dust.

3. K-rails are moved to the outside shoulder (where applicable) and traffic is shifted to the newly paved median area.

4. Highway widening (where applicable) is constructed on the outside of the existing roadway. Activities would include placement of California red-legged frog exclusionary fencing, removal of outside shoulder vegetation (predominately ruderal grasses and ornamental shrubs), pavement sub-base structural section and asphalt cement paving are constructed, and new pavement delineation (striping and reflective markers) is applied to the new roadway surface. Final activities for each construction section include construction of sound walls, drainage facilities, signs, and erosion control planting. Applying dust palliatives and sweeping is an ongoing activity used to minimize dust.

5. The concrete-lined drainage ditch, located between the truck scales and Greenville Road, will be replaced with a culvert at three locations over a distance of approximately

1,180 feet. Specifications will stipulate that this work be constructed during the summer season to minimize effects to California red-legged frogs.

6. At the end of Stage 1, the newly constructed eastbound HOV lanes and auxiliary lanes from east of Greenville Road to west of Portola Avenue will be fully opened to traffic.

7. Stage 2, from west of the Portola Avenue Interchange to the Hacienda Drive Interchange, will be constructed using a similar series and sequence of construction activities. At Cottonwood Creek, an ephemeral drainage, the dual reinforced concrete box culvert will be extended and drainage facilities modified, and specifications will stipulate that this work be constructed during the summer season to minimize effects to California red-legged frogs.

8. Stage 3, construction of auxiliary lanes from west of the Portola Avenue Interchange to the First Street Interchange will be constructed using a similar series and sequence of construction activities as used for stages 1 and 2. At crossings of Arroyo Las Positas Creek specifications will stipulate that this work be constructed during the summer season to minimize effects to California red-legged frogs.

Staging Locations

With minor exception, the addition of the auxiliary lanes and the additional pavement to allow for implementation of a future double HOT lane facility will be constructed with the existing ROW of Interstate 580. The exception consists of a small fee take near Arroyo Las Positas, and minor permanent and temporary easements that will be needed for specific retaining wall segments. Retaining Wall 7 will need a permanent easement for both tieback and soil nail walls to be installed under the existing pavement. A temporary Construction Easement is currently required for Retaining Wall 10; however, this retaining wall may not be needed if ROW negotiations with the owner allow for grading of the small mound at this location. In addition, a small ROW easement will also be needed in the southwest quadrant near Station 693 at the Arroyo Las Positas Bridge (No. 33-0085) just east of the Portola Avenue overcrossing to accommodate bridge widening activities. No staging will be located outside of the existing roadway ROW.

Construction Activities

The major construction activities are as follows:

1. The contractor will stage construction activities in the highway median and areas within the interchanges and access to construction areas will be from the highway or ramps.

2. Construction of the roadway widening, auxiliary lanes, shoulders, and on- and off-ramps, will be preceded by clearing and grubbing, as needed, to a depth of not more than 2 feet and followed by roadway excavation work (as needed). The roadway cross section will then be constructed by placing and then compacting the structural section sub-base

materials in place; paving will follow. Roadway side slopes will be compacted and treated with erosion control.

3. Retaining walls will be either formed reinforced concrete, cast in place, on spread footings, or tie-back walls. Select backfill will be placed behind the formed reinforced concrete walls and under the footings for drainage; the select material will be compacted in place. The tie-back walls will require cutting back the slopes, drilling into the existing soil, inserting soil nails and grout into the drilled holes and applying shotcrete to the surface to form the wall. The retaining walls at the Hacienda Drive interchange and near the Las Colinas Overcrossing will be tie-back walls; all other retaining walls will be reinforced concrete walls on spread footings or cast-in-drilled-hole piles.

4. The culvert extension at Cottonwood Creek will be formed in place by over-excavating by up to 5 feet along the sides of the proposed culvert. The bottom of the channel will be excavated to the thickness of the box culvert, and the reinforced concrete box culvert will be constructed on native soil. Select backfill will be placed behind the sides of the box culvert walls. Downstream from the box culvert, the channel bed will be excavated approximately 5.8 feet and rip-rap placed for water energy dissipation.

5. At Greenville Road, the existing parallel drainage ditch will be reconstructed by saw-cutting the existing concrete ditch lining and removing the existing ditch for the length of the replacement culvert. Over-excavating will be necessary to provide select material as backing under and around the culvert. Select material will be compacted and placed under the culvert, the culvert will be installed, and select materials placed and compacted around the pipe culvert. Reinforced concrete wing walls will be formed and constructed in place at each end of the pipe culvert section. The culvert will be covered and the roadway fill will extend over the top of the pipe culvert.

6. Type D Erosion control will be used along the length of the project and to restore temporary work areas that are not paved. This erosion control mix is made up of 12.5 percent Spanish clover, 25 percent pygmy leaf lupine, 25 percent California barley, 16.7 percent big squirreltail, and 20.8 percent native pine bluegrass (percentages calculated by weight). Irrigation is not proposed.

7. Ornamental plantings will be provided as replacement planting within interchange areas and not along the outside shoulders of the mainline or between the ramps and the highway ROW.

8. Widening of Bridge No 33-0203 on Arroyo Las Positas (immediately east of the Portola Avenue overcrossing). The south side of the existing bridge will be widened approximately 32 feet. Four additional 2-foot-6 inch by 3 foot bridge columns will be placed in the culvert. Each column will be supported by a 9 by 6 by 3-foot deep column footing supported by six HP 12 piles driven into the ground. A 10 by 7-foot area will be excavated in the creek bottom to a depth of approximately 15 feet for the construction of each column footing. Once the piles are driven and the column footing and column are constructed, the excavated area will be backfilled with native

material. Bridge abutments will be constructed at the top of the channel slope. After the columns and abutments are constructed falsework will be placed over the creek and the bridge deck will be constructed.

9. Widening of Bridge No 33-0085 on Arroyo Las Positas (approximately 500 feet west of the Las Colinas Road overcrossing). The south side of the existing bridge will be widened approximately 32 feet. Four additional 2 foot-6 inch by 3-foot bridge columns will be placed in the culvert. Each column will be supported by a 6 by 6 by 3-foot deep column footing supported by four HP 12 piles driven into the ground. A 7 by 7-foot area will be excavated in the creek bottom to a depth of approximately 15 feet for the construction of each column footing. Once the piles are driven and the column footing and column are constructed the excavated area will be backfilled with native material. Bridge abutments will be constructed at the top of the channel slope. After the columns and abutments are constructed falsework will be placed over the creek and the bridge deck will be constructed.

10. Extension of the culvert on Arroyo Seco. The culvert at Arroyo Seco consists of three 12 by 10-foot reinforced concrete boxes (side by side) that will be extended approximately 35 feet. The existing outlet and wingwalls will be removed and the bottom of the existing channel will be excavated to the thickness of the box culvert. The sides of the existing channel will be excavated by approximately 5 feet to accommodate the forming for the box culvert extension. The box culvert extension and outlet wing walls will be constructed on native soil. Select backfill will be placed behind the sides of the box culvert walls.

Construction Site Restoration

The contractor will restore all temporarily disturbed work areas to conditions that are equal to or better than the original conditions in accordance with Caltrans requirements. Site restoration will be completed concurrently with project construction. All debris, construction spoils, remaining installation materials, and miscellaneous litter will be removed for proper off-site disposal. Streambank contours will be re-established following construction and permanent erosion control will be installed, if necessary. Streambanks will be restored to their approximate original configuration/contours or to a more stable final contour. Drainage banks may be stabilized using certified weed-free straw bales, biodegradable jute, or other appropriate methods (e.g., sediment logs). More aggressive erosion control treatments will be implemented as needed. Where appropriate, discarded soil will be left in a roughened condition to reduce erosion and promote revegetation. Permanent erosion control measures will be implemented following completion of construction on an as-needed basis.

Proposed Conservation Measures

Caltrans will avoid, minimize, and compensate for effects to the California red-legged frog by implementing the following measures:

1. Caltrans will compensate for their adverse effects to the California red-legged frog due to habitat loss by providing 3:1 compensation which equates to 12.6 acres. With Service approval, the proposed compensation will be completed using one or a combination of the following:

   Compensation will be satisfied through in-perpetuity preservation of high quality California red-legged frog habitat consisting of a breeding and/or significant dispersal habitat between breeding populations through purchase of bank credits, acquisition of a conservation easement or fee title, and/or contribution to an in-lieu fee program that complies with FHWA policy for Federal aid participation. Purchase of the site will be reviewed and approved by the Service.

   If a compensation bank is proposed in lieu of acquisition, it will be a Service-approved bank and reviewed and approved by the Service prior to the purchase of credits.

   A Service-approved ecologically-based conservation easement will include restricted public access, a management plan, and an in-perpetuity endowment or other permanent non-wasting management fund based on a property analysis. The management plan will include a description of the site, management needs (e.g. grazing plan, non-native vegetation and animal control, etc), when the management activities will be implemented, how often and to what level monitoring of the site will occur, and a action or contingency plan to address potential management issues.

   Proposed habitat acquisition will be accompanied by a Service-approved conservation easement that will include restricted public access, a management plan, and an in-perpetuity endowment based on a property analysis.

   The preservation of California red-legged frog habitat through suitable acquisition or purchase of credits at a conservation bank must minimize the effects of habitat loss. Land would be protected and managed for the conservation of the species in perpetuity. The protected land will provide habitat for breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the project. These lands must help maintain the geographic distribution of the species and contribute to the recovery of the species by increasing the amount of habitat that is secure from development threats and the other factors that threaten the species that can be addressed by habitat protection and management.

2. Caltrans will provide a Funding Assurance Letter stating that sufficient funds for habitat compensation have been budgeted in the Interstate 580 Eastbound HOV Project Expenditure Authorization. The Funding Assurance Letter will be signed by the District Deputy Director of Project Management and the District Deputy Director of Environmental Planning and Engineering. The Funding Assurance Letter provides evidence that Caltrans has allocated sufficient funding to implement the proposed compensation.

3. The Resident Engineer or their designee will be responsible for implementing the conservation measures and *Terms and Conditions* of this biological opinion and will be the point of contact for the project. The Resident Engineer or their designee will maintain a copy of this biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the Service at least 30 calendar days prior to groundbreaking. Prior to ground breaking, the Resident Engineer will submit a letter to the Service verifying that they possess a copy of this biological opinion and have read and understand the *Terms and Conditions*.

4. Caltrans will require all contractors to comply with the Act in the performance of the action and will perform the action as outlined in this biological opinion and supporting documentation submitted to the Service by Caltrans.

5. Qualifications of proposed biological monitor(s) will be submitted to the Service for approval at least 30 calendar days prior to initiating construction activities.

6. Prior to approval, the biological monitor(s) will submit a letter to the Service verifying that they possess a copy of this biological opinion and understand its *Terms and Conditions*. The biologist(s) will keep a copy of this biological opinion in their possession when on-site.

7. All construction personnel will attend a mandatory Worker Environmental Awareness Training Program delivered by the Service-approved biologist prior to working on the project site. The program will focus on the conservation measures that are relevant to employee's personal responsibility and will include an explanation as how to best avoid take of the California red-legged frog. The program will include an explanation of Federal laws protecting the California red-legged frog as well as the importance of compliance with this biological opinion. Distributed materials will include wallet-sized cards with a distinctive photograph of the California red-legged frog, compliance reminders, and relevant contact information. An outline of the program will be submitted to the Coast Bay/Forest Foothills Division Chief in the Sacramento Fish and Wildlife Office within 20 working days prior to the initial onset of construction activities. As needed, training will be conducted in Spanish for Spanish language speakers. Documentation of the training, including sign-in sheets, will be kept on file and available on request.

8. Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

9. The Service-approved biologist(s) will be on-site during any ground disturbing activities within or adjacent to suitable California red-legged frog habitat that has the potential to adversely affect the California red-legged frog.

10. Service-approved biologist(s) will have the authority to stop any work, through communication with the Resident Engineer or their designee that may result in take of a listed species. If the biologist(s) exercises this authority, the Service will be notified by

telephone within one working day. The Service contact is the Coast Bay/Forest Foothills Division Chief in the Sacramento Fish and Wildlife Office at (916) 414-6600.

11. Prior to construction, environmentally sensitive areas will be delineated using high-visibility orange construction fencing installed along the perimeter of the work areas to clearly delineate the extent of the construction area. The project plans will show the locations where fencing will be installed. The plans will also define the fencing installation procedure. The project's special provisions package will provide clear language regarding acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within sensitive areas.

12. No more than 30 calendar days prior to any ground disturbance, pre-construction surveys will be conducted by a Service-approved biologist for the California red-legged frog. They will consist of walking surveys of the project limits and accessible adjacent areas within at least 50 feet of the project limits where feasible. The biologist(s) will investigate all potential California red-legged frog cover sites. This includes thorough investigation of mammal burrows, rock and soil cracks, root wads, and debris. Native vertebrates found in the cover sites will be documented and relocated to an adequate cover site in the action area vicinity. The entrances and other refuge features within the project limits will be collapsed or removed following investigation and clearance.

13. The Service-approved biologist(s) will perform a clearance survey immediately prior to the initial ground disturbance within or adjacent to suitable California red-legged frog habitat. Safety permitting, the Service-approved biologist(s) will investigate areas of disturbed soil for signs of listed species within 30 minutes following the initial disturbance of that given area.

14. During construction activities outside the existing hardscape and within or adjacent to suitable California red-legged frog habitat, the Service-approved biologist(s) will conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction is occurring within or adjacent to suitable habitat.

15. If a California red-legged frog, or any frog that the Service-approved biologist or construction personnel believe may be the species, is encountered during construction, or if any contractor, employee, or agency personnel inadvertently kills or injures a California red-legged frog, the following protocol will be followed:

    a. All work that could result in direct injury, disturbance, or harassment of the animal will immediately cease;

    b. The Caltrans Resident Engineer will be immediately notified;

    c. The Caltrans Resident Engineer will consult with the Service-approved biologist;

d. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the frog, the frog will be left at the location of discovery and monitored by the Service-approved biologist. If possible, California red-legged frogs will not be handled and will be allowed to exit the work area on their own. The animal will be captured and relocated using Service guidelines if safe avoidance is not possible. All project personnel will be notified of the finding, and at no time will work occur within the vicinity of the individual(s) without the Service-approved biologist present. The Service-approved biologist will advise the Caltrans Resident Engineer or their designee on how to proceed; and

e. The Service-approved biologist will contact the Service within 24 hours to report the incident.

16. Construction activities that would disturb soil or have the potential to result in siltation to waterbodies will be limited to the summer season, defined in the construction contract specifications as April 15 to October 15; however, construction activities within creeks and the concrete-lined drainage ditches will not be initiated until these features are dry regardless of date.

17. Nighttime construction will be minimized to the extent practicable.

18. Vegetation clearing and construction operations will be limited to the minimum necessary in areas of temporary access, work areas, and staging. Trees, snags, shrubs, other vegetation, woody debris, and uncompacted forest litter will be protected to the maximum extent practicable. Tree and shrub trimming will be minimized to the extent possible. Trees will be pruned, or shrubs that interfere with construction or project operation will be pruned or topped. Shrubs will be trimmed above ground and roots will be left intact. All vegetation trimmings will either be hauled off-site and disposed of properly, or chipped and left on-site as determined by the Resident Engineer.

19. Removal of vegetation will be accomplished by a progressive cutting of vegetation from the overstory level to the ground level to allow California red-legged frogs more opportunity move out of the work area under their own volition.

20. A Water Pollution Control Program and erosion control BMPs will be implemented to minimize erosion. Protective measures will include:

a. No discharge of pollutants from vehicle or equipment cleaning will be allowed into any storm drains or water courses.

b. 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 facilities.

c. Concrete waste and water from curing operations will be collected in washouts and will be disposed of and not allowed into water courses.

d. Dust control will be implemented by using water trucks and/or tackifiers in excavation and fill areas, temporary stockpiles will be covered when weather conditions require.

e. Silt fences, coir rolls, or straw wattles will be installed along or at the base of slopes during construction to capture sediment.

f. To protect graded areas from erosion, a combination of silt fences, fiber rolls, and erosion control netting (such as jute or coir) will be used appropriately on sloped areas.

g. All slopes or unpaved areas temporarily affected by the proposed project will be recontoured to the extent feasible, to match pre-project conditions, and reseeded with an appropriate plant mix, including native grasses and shrubs to stabilize the slopes and bare ground against erosion.

21. Caltrans will comply with Federal Executive Order 13112 to reduce the spread of invasive non-native plant species and minimize the potential decrease of palatable vegetation for wildlife species. In the event that high- or medium-priority noxious weeds are disturbed or removed during construction or construction-related activities, the contractor will contain the plant material associated with these noxious weeds (particularly giant reed and yellow star thistle), and dispose of it in a manner that will not promote the spread of the species.

22. All imported fill material will be certified to be non-toxic and weed free.

23. Plastic monofilament netting (erosion control matting) or similar material will not be used in the action area because California red-legged frogs can become entangled and trapped in it. Instead, Caltrans will use alternative materials such as coconut coir matting or pacified hydroseeding compounds.

24. All construction pipes, culverts, or similar structures, construction equipment or construction debris left overnight within or adjacent to suitable frog habitat will be inspected for California red-legged frogs by the Service-approved biologist prior to the beginning of each day's activities and prior to moving equipment and materials.

25. All food and food-related trash items will be enclosed in sealed trash containers and removed completely from the site at the end of each day.

26. No firearms will be allowed in the action area except for those carried by authorized security personnel, or local, State, or Federal law enforcement officials.

27. No pets will be permitted in the action area.

28. Stockpiled material (gravel fill, vegetation cuttings, etc.) will have a linear barrier about the toe for sediment control. Erosion control supplies will be on hand to cover and/or

secure the stock in the event of rain or high winds. Stockpiles will be removed from the action area at the earliest opportunity.

29. A Revegetation Plan will be prepared for restoration of temporary work areas. Pavement and base will be removed; topography blended with the surrounding area; and topsoil will be salvaged from the new alignment area to be placed over the restored area, which will then be revegetated with native grassland species.

30. Caltrans will provide a revegetation plan to be reviewed and approved by the Service no later than 60 calendar days prior to groundbreaking. The plan is not limited to but will include: schedule; methodology; a list of the seed mixes and container plants; plant material source; irrigation; maintenance schedule; monitoring program; success criteria; non-native control; and remediation and adaptive management. In addition, annual monitoring reports on the success of the plantings will be provided to the Service for at least the first four years following project completion.

31. A Spill Response Plan will be prepared and implemented.

32. Vehicle and equipment refueling and lubrication will only be permitted in designated disturbed or developed areas where accidental spills can be immediately contained.

33. All spills and drips will be cleaned up immediately.

34. A spill kit will be stationed for easy access and will include granular absorbents, absorbent pads, and 55-gallon drums to segregate the waste.

35. All major servicing and cleaning of the equipment will be performed prior to arrival on-site. Any minor servicing such as refilling of coolants, oil, and lubrication will be performed over the plastic-sheeted area.

36. All small-quantity chemicals will be safeguarded against accidental spills and contact with stormwater by storage of the materials in their original containers either on support vehicles or bermed plastic sheeted areas which provide secondary containment.

Analytical Framework for the Jeopardy Determination

The following analysis relies on four components to support the jeopardy determination for the California red-legged frog: (1) the *Status of the Species*, which evaluates the species' range wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; (3) the *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with the implementing regulations for section 7 and Service policy, the jeopardy determination is made in the following manner: the effects of the proposed Federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the species' current status and, for non-Federal activities in the action area, those actions likely to affect the species in the future, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the species and the role of the action area in providing for those needs as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the proposed action, the action area includes all lands associated with the approximately 131.94-acre project footprint.

Status of the California Red-Legged Frog

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813). Critical habitat was designated for this species on April 13, 2006 (71 FR 19244) and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al*. 2010). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description: The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution: The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the Central California Coast. Isolated populations have been documented in the Sierra Nevada, northern

Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (CDFG 2011).

Status and Natural History: California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al*. 2003, Stebbins 2003). However, they also inhabit ephemeral creeks, drainages and ponds with minimal riparian and emergent vegetation. California red-legged frogs breed from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules or overhanging willows (Storer 1925, Hayes and Jennings 1988). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984).

Habitat includes nearly any area within 1 to 2 miles of a breeding site that stays moist and cool through the summer including vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees (Fellers 2005). Sheltering habitat for California red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provide cover, such as animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5-mile, with a few individuals moving up to 1 to 2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al*. (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger *et al*. (2003) reported that non-migrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, i.e., California blackberry, poison oak and coyote brush. Dispersing frogs in northern Santa Cruz County traveled distances from 0.25-mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al*. 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment in eastern Contra Costa County, Tatarian (2008) noted that a 57 percent majority of frogs fitted with radio transmitters in the Round Valley study area stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. Her study reported a peak seasonal terrestrial movement occurring in the fall months associated with the first 0.2-inch of precipitation and tapering off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the base of trees or rocks, logs, and under man-made structures; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from one to four days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Upland refugia closer to aquatic sites were used more often and were more commonly associated with areas exhibiting higher object cover, e.g., woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after six to 14 days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al*. 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand resulted in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis three and a half to seven months following hatching and reach sexual maturity two to three years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than one percent of eggs laid reaching metamorphosis (Jennings *et al*. 1992). California red-legged frogs may live eight to ten years (Jennings *et al*. 1992). Populations can fluctuate from year to year; favorable conditions allow the species to have extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, the animal may temporarily disappear from an area when conditions are stressful (e.g., during periods of drought, disease, etc.).

The diet of California red-legged frogs is highly variable and changes with the life history stage. The diet of the larvae is not well studied, but is likely similar to that of other ranid frogs, feeding on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005; Kupferberg 1996a, 1996b, 1997). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific chorus frog, three-spined stickleback and, to a limited extent, California mice, which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult frogs varied in their feeding activity periods;

juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination, feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Recovery Plan: The recovery plan for the California red-legged frog identifies eight recovery units (Service 2002). The establishment of these recovery units is based on the determination that various regional areas of the species' range are essential to its survival and recovery. The status of the California red-legged frog was considered within the small scale recovery units as opposed to their overall range. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of its range. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations. Thus when combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy identified within the recovery plan will allow for the recolonization of habitats within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

Threats: Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs, and suggested that bullfrogs could prey on subadult California red-legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with California red-legged frog reproduction by eating adult male California red-legged frogs. Both California and northern red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; Jennings 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

The urbanization of land within and adjacent to California red-legged frog habitat has also affected the threatened amphibian. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks dispersal, and the introduction of predatory fishes and bullfrogs. Diseases may also pose a significant threat, although the specific effects of disease on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson *et al*. 2003). Chytridiomycosis and

ranaviruses are a potential threat because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson *et al*. 2003; Lips *et al*. 2006). Mao *et al*. (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric threespine sticklebacks in northwestern California. Non-native species, such as bullfrogs and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al*. 2006). Human activities can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e., contaminated boots, waders or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease.

Negative effects to wildlife populations from roads and pavement may extend some distance from the actual road. The phenomenon can result from vehicle-related mortality, habitat degradation, noise and light pollution, and invasive exotic species. Forman and Deblinger (1998) described the area affected as the "road effect" zone. One study along a four-lane road in Massachusetts determined that this zone extended for an average of 980 feet to either side of the road for an average total zone width of approximately 1,970 feet. However, in places they detected an effect greater than 0.6-mile from the road. The road effect zone can also be subtle. Van der Zandt *et al*. (1980) reported that lapwings and black-tailed godwits feeding at 1,575 to 6,560 feet from roads were disturbed by passing vehicles. The heart rate, metabolic rate and energy expenditure of female bighorn sheep increases near roads (MacArthur *et al*. 1979). Trombulak and Frissell (2000) described another type of "road-zone" effect due to contaminants. Heavy metal concentrations from vehicle exhaust were greatest within 66 feet of roads and elevated levels of metals in soil and plants were detected at 660 feet of roads. The "road-zone" varies with habitat type and traffic volume. Based on responses by birds, Forman (2000) estimated the road-zone along primary roads of 1,000 feet in woodlands, 1,197 feet in grasslands, and 2,657 feet in natural lands near urban areas. Along secondary roads with lower traffic volumes, the effect zone was 656 feet. The road-zone with regard to California red-legged frogs has not been adequately investigated.

The necessity of moving between multiple habitats and breeding ponds means that many amphibian species, such as the California red-legged frog are especially vulnerable to roads and well-used large paved areas in the landscape. Van Gelder (1973) and Cooke (1995) have examined the effect of roads on amphibians and found that because of their activity patterns, population structure, and preferred habitats, aquatic breeding amphibians are more vulnerable to traffic mortality than some other species. High-volume highways pose a nearly impenetrable barrier to amphibians and result in mortality to individual animals as well as significantly fragmenting habitat. Hels and Buchwald (2001) found that mortality rates for anurans on high traffic roads are higher than on low traffic roads. Vos and Chardon (1998) found a significant negative effect of road density on the occupation probability of ponds by the moor frog (*Rana arvalis*) in the Netherlands. In addition, incidences of very large numbers of road-killed frogs are well documented (Ashley and Robinson 1996), and studies have shown strong population level effects of traffic density (Carr and Fahrig 2001) and high traffic roads on these amphibians (Van Gelder 1973; Vos and Chardon 1998). Most studies regularly count road mortalities from slow moving vehicles (Hansen 1982; Rosen and Lowe 1994; Drews 1995; Mallick *et al*. 1998) or

by foot (Munguira and Thomas 1992). These studies assume that every victim is observed, which may be true for large conspicuous mammals, but may be an incorrect assumption for small animals, such as the California red-legged frog. Amphibians appear especially vulnerable to traffic mortality because they readily attempt to cross roads, are small and slow-moving, and thus are not easily avoided by drivers (Carr and Fahrig 2001).

Metapopulation and Patch Dynamics: The direction and type of habitat used by dispersing animals is especially important in fragmented environments (Forys and Humphrey 1996). Models of habitat patch geometry predict that individual animals will exit patches at more "permeable" areas (Buechner 1987; Stamps *et al.* 1987). A landscape corridor may increase the patch-edge permeability by extending patch habitat (La Polla and Barrett 1993), and allow individuals to move from one patch to another. The geometric and habitat features that constitute a "corridor" must be determined from the perspective of the animal (Forys and Humphrey 1996).

Because their habitats have been fragmented, many endangered and threatened species exist as metapopulations (Verboom and Apeldom 1990; Verboom *et al.* 1991). A metapopulation is a collection of spatially discrete subpopulations that are connected by the dispersal movements of the individuals (Levins 1970; Hanski 1991). For metapopulations of listed species, a prerequisite to recovery is determining if unoccupied habitat patches are vacant due to the attributes of the habitat patch (food, cover, and patch area) or due to patch context (distance of the patch to other patches and distance of the patch to other features). Subpopulations on patches with higher quality food and cover are more likely to persist because they can support more individuals. Large populations have less of a chance of extinction due to stochastic events (Gilpin and Soule 1986). Similarly, small patches will support fewer individuals, increasing the rate of extinction. Patches that are near occupied patches are more likely to be recolonized when local extinction occurs and may benefit from emigration of individuals via the "rescue" effect (Hanski 1982; Gotelli 1991; Holt 1993; Fahrig and Merriam 1985). For the metapopulation to persist, the rate of patches being colonized must exceed the rate of patches going extinct (Levins 1970). If some subpopulations go extinct regardless of patch context, recovery actions should be placed on patch attributes. Patches could be managed to increase the availability of food and/or cover.

Movements and dispersal corridors likely are critical to California red-legged frog population dynamics, particularly because the animals likely currently persist as metapopulations with disjunct population centers. Movement and dispersal corridors are important for alleviating over-crowding and intraspecific competition, and also they are important for facilitating the recolonization of areas where the animal has been extirpated. Movement between population centers maintains gene flow and reduced genetic isolation. Genetically isolated populations are at greater risk of deleterious genetic effects such as inbreeding, genetic drift, and founder effects. The survival of wildlife species in fragmented habitats may ultimately depend on their ability to move among patches to access necessary resources, retain genetic diversity, and maintain reproductive capacity within populations (Hilty and Merenlender 2004; Petit *et al.* 1995; Buza *et al.* 2000).

Most metapopulation or meta-population-like models of patchy populations do not directly include the effects of dispersal mortality on population dynamics (Hanski 1994; With and Crist

1995; Lindenmayer and Possingham 1996). Based on these models, it has become a widely held notion that more vagile species have a higher tolerance to habitat loss and fragmentation than less vagile species. But models that include dispersal mortality predict exactly the opposite: more vagile species should be more vulnerable to habitat loss and fragmentation because they are more susceptible to dispersal mortality (Fahrig 1998; Casagrandi and Gatto 1999). This prediction is supported by Gibbs (1998), who examined the presence-absence of five amphibian species across a gradient of habitat loss. He found that species with low dispersal rates are better able than more vagile species to persist in landscapes with low habitat cover. Gibbs (1998) postulated that the land between habitats serves as a demographic "drain" for many amphibians. Furthermore, Bonnet *et al.* (1999) found that snake species that frequently make long-distance movements have higher mortality rates than do sedentary species.

Environmental Baseline for the California Red-Legged Frog in the Action Area

The proposed project is within Recovery Unit 4 (South and East San Francisco Bay) (Service 2002). The action area falls within Core Area #16 (East San Francisco Bay) of that Recovery Unit (Service 2002). The conservation needs for the East San Francisco Bay core area are: (1) protecting existing populations; (2) studying the effects of grazing on habitat; (3) reducing grazing impacts; (4) protecting habitat connectivity; (5) minimizing impacts from off-road travel and other recreational activities; (6) reducing impacts of urban development; and (7) protecting habitat buffers from nearby urbanization.

Caltrans did not conduct protocol-level frog surveys in the action area to support their baseline analysis for the project. Due to limited access and survey data, the Service used aerial photography and field observations to independently identify available upland habitat for refugia and dispersal as well as potential riparian and aquatic habitat within the action area vicinity.

The California red-legged frog is reasonably certain to occur with the proposed action area based on the known distribution and the habitat conditions within the action area.

The proposed action area is well within the species' current range. The species was observed on October 14, 2004 within a portion of Arroyo Las Positas located just east of the proposed Interstate 580/Isabel Interchange, approximately 330 feet south of the project footprint (Caltrans 2007). Another California red-legged frog was observed in Arroyo Las Positas between Kitty Hawk Bridge and the Interstate 580 Bridge in September 2004 (CNDDB 2011). There also are 12 records of the California red-legged frog in the California Department of Fish and Game's California Natural Diversity Data Base (CNDDB) from within 1-mile of the proposed project area (CNDDB 2011). This listed amphibian has been documented to move more than 2 miles and there are suitable breeding sites within this distance from the action area.

The Service believes that the California red-legged frog is reasonably certain to occur within the action area because: (1) it is located within the species' range and current distribution; (2) appropriate aquatic, riparian, and upland habitat is located within and immediately adjacent to the project footprint; (3) the proximity of recorded observations; (4) all the elements needed to support the species' life history are located within 2 miles of the action area; and (5) the biology and ecology of the animal, especially the ability of adults to move considerable distances.

Effects of the Proposed Action

The proposed Interstate 580 Eastbound HOV Project from East of Greenville Road to Hacienda Drive Project will likely adversely affect the California red-legged frog during the construction and operation phases of the project.

Caltrans proposes to minimize construction related effects by implementing the *Conservation Measures* included in the project description section of this biological opinion. Effective implementation of *Conservation Measures* will likely minimize effects to the California red-legged frog but adverse effects are still likely to occur. Therefore, the project has the potential to result in a variety of adverse effects that would result in take of the California red-legged frog. Construction could result in the killing, harming and/or harassment of juveniles and adults inhabiting areas of suitable aquatic and upland habitat. The project as proposed in Caltrans revised project information and in the project description of this biological opinion would result in the removal of approximately 4.175 acres of California red-legged frog habitat.

During the construction phase of the project, permanent and temporal loss of aquatic and upland habitat will result from the removal and/or disturbance of soil and vegetation within the project footprint. Construction noise, vibration, lighting used for possible night work, and increased human activity during the construction phase of the project may interfere with normal behaviors such as feeding, sheltering, movement between refugia and foraging grounds, and other frog essential behaviors. This can result in avoidance of areas that have suitable habitat but intolerable levels of disturbance.

Unless identified by the biological monitor or site personnel, and rescued by the biological monitor, individual California red-legged frogs exposed during excavations likely will be crushed and killed or injured by construction-related activities. Excavated steep-walled holes or trenches are likely to introduce barriers, pitfalls, or refugia for juvenile and adult frogs. Efforts to travel around the excavation or escape the pitfall could lead to harassment that could result in harm to individual frogs. Even with biological monitoring, overall awareness, and proper escape ramps, California red-legged frogs trapped in excavations risk harm due to desiccation, starvation, entombment, or being otherwise injured. Frogs willingly taking cover in excavations also risk harm due to entombment and physical injury from further work being conducted at the excavation. Juvenile frogs are especially prone and may have difficulty escaping steep-walled excavations even less than 1-foot deep.

Proper trash disposal is often difficult to enforce on a large construction site and is a common non-compliance issue. Improperly disposed edible trash could attract predators, such as raccoons, crows, and ravens, to the sites, which could subsequently prey on the listed amphibian. Caltrans commitment to not use erosion control devices with mono-filament should be effective in avoiding the associated risk of entrapment that can result in death by predation, starvation, or desiccation (Stuart *et al.* 2001). Limiting initial construction activities that could result in siltation to waterbodies between April 15 and October 15, primarily avoids the wettest time of year and the onset of the breeding season when frogs are more likely to be involved in upland dispersal. Limiting construction activities within the creeks and drainage ditches to when they are dry is likely to further minimize encounters and adverse effects with California red-legged

frogs. Caltrans will further minimize the effects by locating construction staging, storage and parking areas outside of sensitive habitat; clearly marking construction work boundaries with high-visibility fencing, conducting preconstruction surveys and environmental monitoring, and revegetating temporarily disturbed areas. The amount of take resulting from construction activities and the removal of habitat will be partially minimized by installing wildlife exclusion fencing to deter frogs from wandering onto construction sites; educating workers; and requiring a Service-approved biologist to be present to monitor construction activities.

If unrestricted, the proposed construction activities could result in the introduction of chemical contaminants to frog habitat. Exposure pathways could include inhalation, dermal contact, direct ingestion, or secondary ingestion of contaminated soil, plants or prey species. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. However, Caltrans proposes to minimize these risks by implementing a stormwater pollution prevention plan, erosion control BMPs and a Spill Response Plan.

Preconstruction surveys and the relocation of individual California red-legged frogs may avoid injury or mortality; however, capturing and handling frogs may result in stress and/or inadvertent injury during handling, containment, and transport. Caltrans proposes to minimize these effects by using Service-approved biologists, limiting the duration of handling, and relocating amphibians to suitable nearby habitat in accordance with Service guidance.

If unrestricted, biologists and construction workers traveling to the action area from other project sites may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytridiomycosis, caused by chytrid fungus, may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch *et al.* 2001, Weldon *et al.* 2004). Caltrans proposes to eliminate these risks by implementing proper decontamination procedures prior to and following aquatic surveys and handling amphibians. These will minimize the risk of transferring diseases through contaminated equipment or clothing. Proper handling and relocation of frogs out of construction areas increases the likelihood of their survival.

As described in *Conservation Measure 1*, Caltrans has proposed in-perpetuity preservation of 12.6 acres of high quality California red-legged frog habitat that will be located within Alameda County. This habitat preservation is likely to offset adverse effects of habitat loss and fragmentation and assist in the protecting large areas of contiguous California red-legged frog habitat and other wildlife species within a functioning ecosystem. Additional benefits of preserving habitat is distancing individuals and habitat from the effects of development and providing habitat for dispersal.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future